

# PRELIMINARY DRAFT – FOR INTERNAL USE ONLY

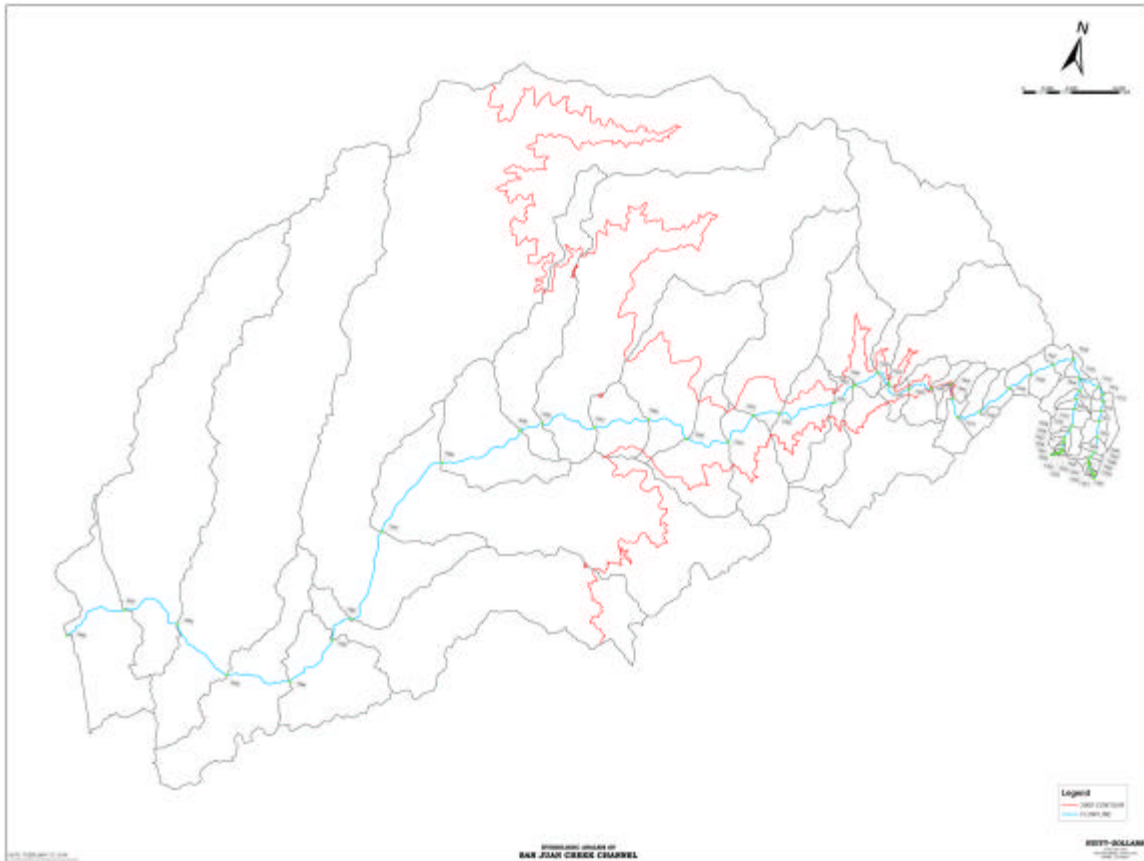
## HYDROLOGIC REPORT TO THE BASELINE HYDROLOGIC CONDITIONS SAN JUAN AND UPPER SAN MATEO WATERSHEDS

**PREPARED FOR**



RANCHO MISSION VIEJO

**APRIL 2, 2004**



**VOLUME I**

**HUNT-ZOLLARS**

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## INTRODUCTION

Huitt-Zollars, Inc. was requested by Rancho Mission Viejo, L.L.C. to prepare a hydrologic model that is in conformance to the County of Orange criteria. After meeting with the County, Huitt-Zollars was told they could use the methodology as followed within the Rivertech Study prepared in 1987 for the San Juan Watershed. Huitt-Zollars prepared this analysis to show the changes between the existing condition and the proposed B-4 Ranch Plan Development Alternative. The Huitt-Zollars' report is a supplement to the baseline hydrologic conditions for San Juan and Upper San Mateo Watersheds, prepared by Philip Williams & Associates. This supplement will give the County a sensitivity analysis between the two hydrologic models as it pertains to changes between the existing conditions and proposed development.

The Hydrologic Analysis for the San Juan Creek Main Stem has been completed to the downstream boundary of the Rancho Mission Viejo (Ranch) property, approximately 2¼ miles upstream of the Interstate 5 crossing. The watershed encompasses almost 107 square miles that extend into the Cleveland National Forest, Santa Ana Mountains, and the Elsinore Mountains in Riverside County. The watershed elevations range from approximately 130 feet above sea level at the downstream Ranch boundary to over 3,500 feet above sea level at the headwaters.

2-Year, 10-Year, and 100-Year Expected Value and 100-Year High Confidence analyses were prepared. The hydrologic analyses were completed in accordance with the 1986 Orange County Hydrology Manual and 1995 Orange County Hydrology Manual Addendum No. 1. The application of the procedures outlined in these two documents and the assumptions used to develop hydrologic parameters are described in this report.

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## MODEL OVERVIEW

Since the procedures of the Orange County Hydrology Manual were calibrated to a single area unit hydrograph, a series of single area unit hydrographs have been prepared along the San Juan Creek Main Stem. Working downstream, a rational method analysis was prepared for the headwaters of San Juan Creek, which is the Morrell Canyon area. As soon as the total upstream tributary drainage area exceeded 640 acres, a unit hydrograph was calculated based on parameters from the rational method analysis such as basin lag. The peak flow rates from the two methods were compared. If the rational method peak flow rate was larger, then this flow rate was used to route flows downstream to the next concentration node. If the unit hydrograph peak flow rate was larger, then this flow rate was used to route flows downstream to the next concentration node. The travel time was calculated to this concentration node and used to estimate a new basin lag for development of a unit hydrograph that included the additional area tributary at this concentration node. This process was continued downstream with concentration nodes located at major confluences or other points of significance such as Ortega Highway crossings. Due to differences in methodology for different return events, specifically, the 2-Year Expected Value analysis versus the others analyzed, two distinct models were created.

To model the 10-Year and 100-Year Expected Value and 100-Year High Confidence analyses, the Advanced Engineering Software RATSCx program was utilized. The RATSCx program allows for both rational method and unit hydrograph method analyses to be completed using one data file. By using the RATSCx program, parameters such as rainfall depths and land use/soil type combinations are input on a sub-area basis and tabulated for calculations of loss

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rates. Additionally, the hydraulic calculations to estimate travel times between concentration nodes and, ultimately, basin lag are internal to the program. A limitation of the program is that S-Graph proportions can only be specified on a data file basis. Therefore, 34 separate RATSCx data files were developed, one for each concentration node, and linked together using a network file that executes the data files in upstream to downstream order.

To model the 2-Year Expected Value analysis, both the Advanced Engineering Software RATSCx and FLOODSCx programs were utilized. The RATSCx program was used to develop the rational method analysis to the first hydrograph location. According to the Orange County Hydrology Manual Addendum No. 1,  $F_p = 0.60$  in/hr for all areas independent of soil type. Unfortunately, the RATSCx program requires that these  $F_p$  values be manually specified and, thus, does not tabulate soil types or curve numbers that could be used to develop loss rates for a unit hydrograph analysis. Therefore, the FLOODSCx program was used to develop unit hydrographs based on data calculated both from the rational method analysis and from other tabulations of rainfall and land use/soil type combinations. The time of concentration ( $T_c$ ) from the rational method was used to calculate the basin lag at the first unit hydrograph location. Rainfall, S-Graph proportions, losses, and channel routing information, including travel times,  $T_c$ 's, and downstream basin lag estimates, were calculated outside of the FLOODSCx program.

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## ASSUMPTIONS

### Base Maps and Topographic Data

Due to the size and extents of the watershed, the base map for the existing and proposed condition model was created using three and four separate sources, respectively. Both base maps used aerial topography with 2-foot, 5-foot, and 10-foot contour intervals in the vicinity of the Ranch that represent existing conditions of the area. Beyond the extents of the aerial topography, USGS digital topography was utilized to the County boundary. Outside of the County, raster images of USGS quadrangle maps were used. Additionally, the base map for the proposed condition utilized mass grade topographic information that was spliced into existing aerial topography for each of the proposed development bubbles.

### Rainfall

Rainfall intensities and depths were derived from the Orange County Hydrology Manual. Two rainfall zones were incorporated; Non-Mountainous for areas below the 2,000' elevation and Mountainous for areas above the 2,000' elevation. For sub-areas in both zones, weighted averages were calculated. Rainfall intensities and depths for Non-Mountainous and Mountainous zones are presented in Tables 1 and 2.

In the 10-Year and 100-Year Expected Value and 100-Year High Confidence analyses, rainfall depths were input into the model on a sub-area basis. In the 2-Year Expected Value analysis, rainfall depths were specified for the entire upstream tributary area.

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## **Land Use**

As part of the Philip Williams & Associates (PWA) report titled, "Baseline Hydrologic Conditions – San Juan & Upper San Mateo Watersheds," dated May 30, 2001, PWA developed "Land Use Sub-Categories" for the HEC-1 model. Based on descriptions of these sub-categories, the land uses were mapped to hydrologic land uses for input into the models according to Table 3. PWA prepared land use mapping for both the existing and several proposed development conditions. For the proposed condition hydrologic analysis, only one, the Ranch Plan Alternative (B4G), land use plan was evaluated.

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## RAINFALL INTENSITIES

### Non-Mountainous (Elevations <2,000')

2-Year Expected Value		10-Year Expected Value		100-Year Expected Value		100-Year High Confidence	
Time (min)	Intensity (in/hr)	Time (min)	Intensity (in/hr)	Time (min)	Intensity (in/hr)	Time (min)	Intensity (in/hr)
5	1.58	5	3.19	5	4.82	5	6.19
10	1.06	10	2.16	10	3.26	10	4.16
15	0.84	15	1.72	15	2.59	15	3.30
20	0.72	20	1.46	20	2.20	20	2.80
30	0.57	30	1.16	30	1.75	30	2.22
60	0.38	60	0.79	60	1.18	60	1.49
120	0.26	120	0.53	120	0.80	120	1.00

### Mountainous (Elevations >2,000')

2-Year Expected Value		10-Year Expected Value		100-Year Expected Value		100-Year High Confidence	
Time (min)	Intensity (in/hr)	Time (min)	Intensity (in/hr)	Time (min)	Intensity (in/hr)	Time (min)	Intensity (in/hr)
5	2.45	5	5.10	5	7.60	5	10.00
10	1.44	10	3.10	10	4.50	10	6.00
15	1.09	15	2.50	15	3.50	15	4.50
20	0.84	20	1.80	20	2.75	20	3.60
30	0.63	30	1.35	30	2.10	30	2.75
60	0.46	60	1.00	60	1.52	60	1.95
120	0.37	120	0.77	120	1.20	120	1.55

Table 1 – Rainfall Intensities

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## RAINFALL DEPTHS

### Non-Mountainous (Elevations <2,000')

2-Year Expected Value		10-Year Expected Value		100-Year Expected Value		100-Year High Confidence	
Time ( )	Intensity (in)	Time ( )	Intensity (in)	Time ( )	Intensity (in)	Time ( )	Intensity (in)
5-Min	0.13	5-Min	0.26	5-Min	0.40	5-Min	0.52
30-Min	0.28	30-Min	0.59	30-Min	0.87	30-Min	1.09
1-Hr	0.37	1-Hr	0.78	1-Hr	1.15	1-Hr	1.45
3-Hr	0.62	3-Hr	1.31	3-Hr	1.94	3-Hr	2.43
6-Hr	0.85	6-Hr	1.81	6-Hr	2.71	6-Hr	3.36
24-Hr	1.44	24-Hr	3.03	24-Hr	4.49	24-Hr	5.63

### Mountainous (Elevations >2,000')

2-Year Expected Value		10-Year Expected Value		100-Year Expected Value		100-Year High Confidence	
Time ( )	Intensity (in)	Time ( )	Intensity (in)	Time ( )	Intensity (in)	Time ( )	Intensity (in)
5-Min	0.18	5-Min	0.40	5-Min	0.63	5-Min	0.78
30-Min	0.32	30-Min	0.68	30-Min	1.04	30-Min	1.34
1-Hr	0.46	1-Hr	0.99	1-Hr	1.51	1-Hr	1.94
3-Hr	0.94	3-Hr	2.10	3-Hr	3.08	3-Hr	3.96
6-Hr	1.46	6-Hr	3.14	6-Hr	4.81	6-Hr	6.19
24-Hr	2.67	24-Hr	5.71	24-Hr	8.76	24-Hr	11.27

Table 1 – Rainfall Depths

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## LAND USE MAPPING

Land Use Sub-Category	Hydrologic Land Use
General Transportation	Commercial
General Urban Commercial	Commercial
General Developed Areas	5-7 Dwellings/Acre
Fluctuating Shoreline	Public Park
Lakes/Open Water	Public Park
General Disturbed Areas	Barren (Poor)
Broadleaf Chaparral	Chaparral, Broadleaf (Fair)
Broadleaf Chaparral and Sage	Chaparral, Broadleaf (Fair)
Chaparral – Sage Scrub	Chaparral, Broadleaf (Fair)
General Chaparral	Chaparral, Broadleaf (Fair)
Rural Residential	Chaparral, Broadleaf (Fair)
Narrowleaf Chaparral	Chaparral, Narrowleaf (Fair)
General Grassland	Grass (Fair)
Live Oak Savanna	Grass (Fair)
Sumac Savanna	Grass (Fair)
Disturbed Wetlands	Meadows or Cienegas (Fair)
Meadow and Marsh	Meadows or Cienegas (Good)
General Sage Scrub	Open Brush (Fair)
Rock with Plants	Open Brush (Fair)
Sage Scrub- Grassland	Open Brush (Fair)
Streams and Creeks	Open Brush (Fair)
Forest	Woodland (Fair)
Woodland and Riparian	Woodland (Fair)
General Agriculture	Fallow (Poor)
General Nurseries	Orchards, Evergreen (Fair)
General Orchards	Orchards, Evergreen (Fair)
Irrigated Row Crops	Pasture, Dryland (Fair)
Row Crops	Pasture, Dryland (Fair)
General Parks	Turf (Fair)

Table 3 – Land Use Mapping



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## **Hydrologic Soils**

Hydrologic soils were assigned based on the Orange County Hydrology Manual.

## **Antecedent Moisture Condition**

As outlined in the Orange County Hydrology Manual Addendum No. 1, Antecedent Moisture Condition (AMC) II was used for all analyses.

## **Depth Area Adjustments**

As outlined in the Orange County Hydrology Manual, Sierra Madre depth area adjustments were chosen for all calculations.

## **S-Graphs**

At the direction of the County, S-Graph proportions were assigned to be in significant agreement with the Rivertech, Inc. report titled, "San Juan Creek Channel – Facility L01 – Hydrology Study," dated June 1987. In the downstream reaches of the Rivertech Study, the sub-area S-Graph proportions could not be resolved, so assumptions were made based on topography and existing development patterns. For the proposed condition analysis, development bubble areas were assumed to change from "Valley – Undeveloped" to "Valley – Developed."

In the 10-Year and 100-Year Expected Value and 100-Year High Confidence analyses, S-Graph proportions were input into the model on a sub-area basis. In the 2-Year Expected Value analysis, S-Graph proportions were specified for the entire upstream tributary area.

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## **Channel Geometry**

At the direction of the County, channel geometry was designed to be in significant agreement with the Rivertech, Inc. report titled, "San Juan Creek Channel – Facility L01 – Hydrology Study," dated June 1987. Channels were sized to convey the 100-year High Confidence peak flow rates without overtopping. Additionally, the 100-Year High Confidence analysis was used as the determining factor in insuring that travel times for individual reaches met the County criteria outlined in the Hydrology Manual on pages D-12 and D-15.

## **Sub-Areas**

In general, sub-areas were developed so that the sub-area sizes gradually increased as the study progressed downstream. After the first hydrograph was developed on San Juan Creek Main Stem, concentration nodes were located at major confluences or other points of significance such as Ortega Highway crossings. Generally these concentration nodes defined the sub-areas rather than the sub-area size defining the concentration node. Increments in sub-area sizes were, for the most part, less than four square miles. However, there are a few large canyons, such as Hot Spring, Lucas, Bell, and Canada Gobernadora, that drain a significantly larger watershed and the sub-area size increment was correspondingly large.

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## San Juan Creek - Main Stem Hydrologic Summary - Existing Condition

Node	Location	Total Area		Peak Flow Rate			
		(acres)	(sq. mi.)	2-Year EV (cfs)	10-Year EV (cfs)	100-Year EV (cfs)	100-Year HC (cfs)
1046	Ortega Highway Crossing	2,446	3.82	303	1,422	2,558	3,548
1047	Decker Canyon	4,302	6.72	480	2,259	4,126	5,749
1048	Long Canyon	7,127	11.14	772	3,463	6,408	8,754
1050	Bear Canyon	9,516	14.87	921	4,342	7,968	10,721
1053	Lion Canyon	12,821	20.03	1,131	5,044	9,556	13,140
1057	Ortega Highway Crossing	17,423	27.22	1,240	5,713	10,764	14,815
1058	Hot Spring Canyon	23,888	37.33	1,529	7,046	13,168	18,404
1059	Cold Spring Canyon	25,469	39.80	1,529	7,213	13,463	18,926
1060	Ortega Highway Crossing	26,855	41.96	1,529	7,213	13,519	18,927
1061	Lucas Canyon	32,181	50.28	1,545	7,500	14,709	20,621
1062	Bell Canyon - Ranch Boundary	46,437	72.56	1,874	9,035	17,977	26,074
1063	Verdugo Canyon	49,892	77.96	1,953	9,226	18,572	26,925
1065	Trampas Canyon	53,123	83.00	1,953	9,255	18,730	26,943
1066	Canada Gobernadora	61,427	95.98	1,953	9,443	19,596	28,242
1067	Canada Chiquita	66,611	104.08	1,977	9,656	20,187	28,984
1068	Ranch Boundary	68,205	106.57	1,977	9,658	20,247	28,984

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## San Juan Creek - Main Stem Hydrologic Summary - Proposed Condition

Node	Location	Total Area		Peak Flow Rate			
		(acres)	(sq. mi.)	2-Year EV (cfs)	10-Year EV (cfs)	100-Year EV (cfs)	100-Year HC (cfs)
1046	Ortega Highway Crossing	2,446	3.82	303	1,422	2,558	3,548
1047	Decker Canyon	4,302	6.72	480	2,259	4,126	5,749
1048	Long Canyon	7,127	11.14	772	3,463	6,408	8,754
1050	Bear Canyon	9,516	14.87	921	4,342	7,968	10,721
1053	Lion Canyon	12,821	20.03	1,131	5,044	9,556	13,140
1057	Ortega Highway Crossing	17,423	27.22	1,240	5,713	10,764	14,815
1058	Hot Spring Canyon	23,888	37.33	1,529	7,046	13,168	18,404
1059	Cold Spring Canyon	25,469	39.80	1,529	7,213	13,463	18,926
1060	Ortega Highway Crossing	26,855	41.96	1,529	7,213	13,519	18,927
1061	Lucas Canyon	32,181	50.28	1,545	7,500	14,709	20,621
1062	Bell Canyon - Ranch Boundary	46,437	72.56	1,874	9,035	17,977	26,074
1063	Verdugo Canyon	49,888	77.95	1,952	9,244	18,594	26,953
1065	Trampas Canyon	53,247	83.20	1,952	9,429	18,961	27,132
1066	Canada Gobernadora	61,500	96.09	1,952	9,766	20,030	28,752
1067	Canada Chiquita	66,685	104.20	1,952	9,963	20,638	29,486
1068	Ranch Boundary	68,245	106.63	1,952	10,006	20,753	29,527

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## San Juan Creek - Main Stem Hydrologic Summary - 2-Year - Expected Value

### Existing Condition

Node	Location	Total Area		Longest Flowpath (ft)	Lag (hr)	Peak Flow Rate (cfs)	Runoff Volume (ac-ft)
		(ac)	(sq. mi.)				
1046	Ortega Highway Crossing	2,446	3.82	33,774	1.57	303	161
1047	Decker Canyon	4,302	6.72	33,995	1.58	480	271
1048	Long Canyon	7,127	11.14	35,596	1.61	772	499
1050	Bear Canyon	9,516	14.87	38,140	1.67	921	627
1053	Lion Canyon	12,821	20.03	48,059	1.89	1,131	830
1057	Ortega Highway Crossing	17,423	27.22	65,104	2.23	1,240	1,021
1058	Hot Spring Canyon	23,888	37.33	70,549	2.35	1,529	1,332
1059	Cold Spring Canyon	25,469	39.80	72,734	2.41	1,529	1,343
1060	Ortega Highway Crossing	26,855	41.96	80,562	2.60	1,529	1,343
1061	Lucas Canyon	32,181	50.28	88,566	2.82	1,545	1,446
1062	Bell Canyon - Ranch Boundary	46,437	72.56	96,841	3.06	1,874	1,805
1063	Verdugo Canyon	49,892	77.96	99,693	3.12	1,953	1,901
1065	Trampas Canyon	53,123	83.00	110,849	3.38	1,953	1,901
1066	Canada Gobernadora	61,427	95.98	117,144	3.59	1,953	1,901
1067	Canada Chiquita	66,611	104.08	123,345	3.77	1,977	1,989
1068	Ranch Boundary	68,205	106.57	129,669	3.95	1,977	2,004

### Proposed Condition

Node	Location	Total Area		Longest Flowpath (ft)	Lag (hr)	Peak Flow Rate (cfs)	Runoff Volume (ac-ft)
		(ac)	(sq. mi.)				
1046	Ortega Highway Crossing	2,446	3.82	33,774	1.57	303	161
1047	Decker Canyon	4,302	6.72	33,995	1.58	480	271
1048	Long Canyon	7,127	11.14	35,596	1.61	772	499
1050	Bear Canyon	9,516	14.87	38,140	1.67	921	627
1053	Lion Canyon	12,821	20.03	48,059	1.89	1,131	830
1057	Ortega Highway Crossing	17,423	27.22	65,104	2.23	1,240	1,021
1058	Hot Spring Canyon	23,888	37.33	70,549	2.35	1,529	1,332
1059	Cold Spring Canyon	25,469	39.80	72,734	2.41	1,529	1,343
1060	Ortega Highway Crossing	26,855	41.96	80,562	2.60	1,529	1,343
1061	Lucas Canyon	32,181	50.28	88,566	2.82	1,545	1,446
1062	Bell Canyon - Ranch Boundary	46,437	72.56	96,841	3.06	1,874	1,805
1063	Verdugo Canyon	49,888	77.95	99,693	3.12	1,952	1,900
1065	Trampas Canyon	53,247	83.20	110,849	3.38	1,952	1,900
1066	Canada Gobernadora	61,500	96.09	117,144	3.59	1,952	1,900
1067	Canada Chiquita	66,685	104.20	123,345	3.77	1,952	1,922
1068	Ranch Boundary	68,245	106.63	129,669	3.95	1,952	1,939

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## San Juan Creek - Main Stem Hydrologic Summary - 10-Year - Expected Value

### Existing Condition

Node	Location	Total Area		Longest Flowpath (ft)	Lag (hr)	Peak Flow Rate (cfs)	Runoff Volume (ac-ft)
		(ac)	(sq. mi.)				
1046	Ortega Highway Crossing	2,446	3.82	33,774	0.92	1,422	638
1047	Decker Canyon	4,302	6.72	33,995	0.92	2,259	1,111
1048	Long Canyon	7,127	11.14	35,596	0.94	3,463	1,919
1050	Bear Canyon	9,516	14.87	38,140	0.98	4,342	2,484
1053	Lion Canyon	12,821	20.03	48,059	1.11	5,044	3,316
1057	Ortega Highway Crossing	17,423	27.22	65,104	1.32	5,713	4,174
1058	Hot Spring Canyon	23,888	37.33	70,549	1.39	7,046	5,467
1059	Cold Spring Canyon	25,469	39.80	72,734	1.42	7,213	5,659
1060	Ortega Highway Crossing	26,855	41.96	80,562	1.54	7,213	5,700
1061	Lucas Canyon	32,181	50.28	88,566	1.67	7,500	6,401
1062	Bell Canyon - Ranch Boundary	46,437	72.56	96,841	1.80	9,035	8,144
1063	Verdugo Canyon	49,892	77.96	99,693	1.84	9,226	8,415
1065	Trampas Canyon	53,123	83.00	110,849	1.99	9,255	8,606
1066	Canada Gobernadora	61,427	95.98	117,144	2.11	9,443	9,211
1067	Canada Chiquita	66,611	104.08	123,345	2.22	9,656	9,632
1068	Ranch Boundary	68,205	106.57	129,669	2.32	9,658	9,777

### Proposed Condition

Node	Location	Total Area		Longest Flowpath (ft)	Lag (hr)	Peak Flow Rate (cfs)	Runoff Volume (ac-ft)
		(ac)	(sq. mi.)				
1046	Ortega Highway Crossing	2,446	3.82	33,774	0.92	1,422	638
1047	Decker Canyon	4,302	6.72	33,995	0.92	2,259	1,111
1048	Long Canyon	7,127	11.14	35,596	0.94	3,463	1,919
1050	Bear Canyon	9,516	14.87	38,140	0.98	4,342	2,484
1053	Lion Canyon	12,821	20.03	48,059	1.11	5,044	3,316
1057	Ortega Highway Crossing	17,423	27.22	65,104	1.32	5,713	4,174
1058	Hot Spring Canyon	23,888	37.33	70,549	1.39	7,046	5,467
1059	Cold Spring Canyon	25,469	39.80	72,734	1.42	7,213	5,659
1060	Ortega Highway Crossing	26,855	41.96	80,562	1.54	7,213	5,700
1061	Lucas Canyon	32,181	50.28	88,566	1.67	7,500	6,401
1062	Bell Canyon - Ranch Boundary	46,437	72.56	96,841	1.80	9,035	8,144
1063	Verdugo Canyon	49,888	77.95	99,693	1.84	9,244	8,431
1065	Trampas Canyon	53,247	83.20	110,849	1.99	9,429	8,741
1066	Canada Gobernadora	61,500	96.09	117,144	2.11	9,766	9,462
1067	Canada Chiquita	66,685	104.20	123,345	2.22	9,963	9,849
1068	Ranch Boundary	68,245	106.63	129,669	2.32	10,006	10,026

# PRELIMINARY DRAFT - FOR INTERNAL USE ONLY

## San Juan Creek - Main Stem Hydrologic Summary - 100-Year - Expected Value

### Existing Condition

Node	Location	Total Area		Longest Flowpath (ft)	Lag (hr)	Peak Flow Rate (cfs)	Runoff Volume (ac-ft)
		(ac)	(sq. mi.)				
1046	Ortega Highway Crossing	2,446	3.82	33,774	0.81	2,558	1,191
1047	Decker Canyon	4,302	6.72	33,995	0.82	4,126	2,086
1048	Long Canyon	7,127	11.14	35,596	0.83	6,408	3,547
1050	Bear Canyon	9,516	14.87	38,140	0.86	7,968	4,611
1053	Lion Canyon	12,821	20.03	48,059	0.97	9,556	6,074
1057	Ortega Highway Crossing	17,423	27.22	65,104	1.14	10,764	7,710
1058	Hot Spring Canyon	23,888	37.33	70,549	1.21	13,168	10,119
1059	Cold Spring Canyon	25,469	39.80	72,734	1.23	13,463	10,503
1060	Ortega Highway Crossing	26,855	41.96	80,562	1.33	13,519	10,675
1061	Lucas Canyon	32,181	50.28	88,566	1.43	14,709	12,057
1062	Bell Canyon - Ranch Boundary	46,437	72.56	96,841	1.54	17,977	15,436
1063	Verdugo Canyon	49,892	77.96	99,693	1.57	18,572	16,036
1065	Trampas Canyon	53,123	83.00	110,849	1.69	18,730	16,477
1066	Canada Gobernadora	61,427	95.98	117,144	1.79	19,596	17,779
1067	Canada Chiquita	66,611	104.08	123,345	1.87	20,187	18,601
1068	Ranch Boundary	68,205	106.57	129,669	1.95	20,247	18,871

### Proposed Condition

Node	Location	Total Area		Longest Flowpath (ft)	Lag (hr)	Peak Flow Rate (cfs)	Runoff Volume (ac-ft)
		(ac)	(sq. mi.)				
1046	Ortega Highway Crossing	2,446	3.82	33,774	0.81	2,558	1,191
1047	Decker Canyon	4,302	6.72	33,995	0.82	4,126	2,086
1048	Long Canyon	7,127	11.14	35,596	0.83	6,408	3,547
1050	Bear Canyon	9,516	14.87	38,140	0.86	7,968	4,611
1053	Lion Canyon	12,821	20.03	48,059	0.97	9,556	6,074
1057	Ortega Highway Crossing	17,423	27.22	65,104	1.14	10,764	7,710
1058	Hot Spring Canyon	23,888	37.33	70,549	1.21	13,168	10,119
1059	Cold Spring Canyon	25,469	39.80	72,734	1.23	13,463	10,503
1060	Ortega Highway Crossing	26,855	41.96	80,562	1.33	13,519	10,675
1061	Lucas Canyon	32,181	50.28	88,566	1.43	14,709	12,057
1062	Bell Canyon - Ranch Boundary	46,437	72.56	96,841	1.54	17,977	15,436
1063	Verdugo Canyon	49,888	77.95	99,693	1.57	18,594	16,054
1065	Trampas Canyon	53,247	83.20	110,849	1.69	18,961	16,638
1066	Canada Gobernadora	61,500	96.09	117,144	1.79	20,030	18,077
1067	Canada Chiquita	66,685	104.20	123,345	1.87	20,638	18,872
1068	Ranch Boundary	68,245	106.63	129,669	1.95	20,753	19,179

# PRELIMINARY DRAFT - FOR INTERNAL USE ONLY

## San Juan Creek - Main Stem Hydrologic Summary - 100-Year - High Confidence

### Existing Condition

Node	Location	Total Area		Longest Flowpath (ft)	Lag (hr)	Peak Flow Rate (cfs)	Runoff Volume (ac-ft)
		(ac)	(sq. mi.)				
1046	Ortega Highway Crossing	2,446	3.82	33,774	0.76	3,548	1,661
1047	Decker Canyon	4,302	6.72	33,995	0.76	5,749	2,914
1048	Long Canyon	7,127	11.14	35,596	0.78	8,754	4,922
1050	Bear Canyon	9,516	14.87	38,140	0.80	10,721	6,405
1053	Lion Canyon	12,821	20.03	48,059	0.91	13,140	8,445
1057	Ortega Highway Crossing	17,423	27.22	65,104	1.06	14,815	10,694
1058	Hot Spring Canyon	23,888	37.33	70,549	1.12	18,404	14,052
1059	Cold Spring Canyon	25,469	39.80	72,734	1.15	18,926	14,597
1060	Ortega Highway Crossing	26,855	41.96	80,562	1.23	18,927	14,863
1061	Lucas Canyon	32,181	50.28	88,566	1.33	20,621	16,822
1062	Bell Canyon - Ranch Boundary	46,437	72.56	96,841	1.42	26,074	21,691
1063	Verdugo Canyon	49,892	77.96	99,693	1.45	26,925	22,580
1065	Trampas Canyon	53,123	83.00	110,849	1.56	26,943	23,163
1066	Canada Gobernadora	61,427	95.98	117,144	1.64	28,242	25,046
1067	Canada Chiquita	66,611	104.08	123,345	1.72	28,984	26,243
1068	Ranch Boundary	68,205	106.57	129,669	1.79	28,984	26,626

### Proposed Condition

Node	Location	Total Area		Longest Flowpath (ft)	Lag (hr)	Peak Flow Rate (cfs)	Runoff Volume (ac-ft)
		(ac)	(sq. mi.)				
1046	Ortega Highway Crossing	2,446	3.82	33,774	0.76	3,548	1,661
1047	Decker Canyon	4,302	6.72	33,995	0.76	5,749	2,914
1048	Long Canyon	7,127	11.14	35,596	0.78	8,754	4,922
1050	Bear Canyon	9,516	14.87	38,140	0.80	10,721	6,405
1053	Lion Canyon	12,821	20.03	48,059	0.91	13,140	8,445
1057	Ortega Highway Crossing	17,423	27.22	65,104	1.06	14,815	10,694
1058	Hot Spring Canyon	23,888	37.33	70,549	1.12	18,404	14,052
1059	Cold Spring Canyon	25,469	39.80	72,734	1.15	18,926	14,597
1060	Ortega Highway Crossing	26,855	41.96	80,562	1.23	18,927	14,863
1061	Lucas Canyon	32,181	50.28	88,566	1.33	20,621	16,822
1062	Bell Canyon - Ranch Boundary	46,437	72.56	96,841	1.42	26,074	21,691
1063	Verdugo Canyon	49,888	77.95	99,693	1.45	26,953	22,599
1065	Trampas Canyon	53,247	83.20	110,849	1.56	27,132	23,342
1066	Canada Gobernadora	61,500	96.09	117,144	1.64	28,752	25,365
1067	Canada Chiquita	66,685	104.20	123,345	1.72	29,486	26,525
1068	Ranch Boundary	68,245	106.63	129,669	1.79	29,527	26,945



**PRELIMINARY DRAFT – FOR INTERNAL USE ONLY**

**TECHNICAL APPENDIX I-A  
HYDROLOGIC ANALYSIS  
UPSTREAM AREAS  
2-YEAR EXPECTED VALUE**

## Rainfall Depths

### 2-Year - Expected Value - Upstream Areas

Subarea	Area			Rainfall Depth						Node	Area			Rainfall Depth					
	(ac)	< 2000 (ac)	> 2000 (ac)	5-min	30-min	1-hr	3-hr	6-hr	24-hr		(ac)	< 2000 (ac)	> 2000 (ac)	5-min	30-min	1-hr	3-hr	6-hr	24-hr
		X		0.13	0.28	0.37	0.62	0.85	1.44			X		0.13	0.28	0.37	0.62	0.85	1.44
			X	0.18	0.32	0.46	0.94	1.46	2.67			X		0.18	0.32	0.46	0.94	1.46	2.67
1000	1.3	0.0	1.3	0.18	0.32	0.46	0.94	1.46	2.67	1001	1.3	0.0	1.3	0.18	0.32	0.46	0.94	1.46	2.67
1001	1.2	0.0	1.2	0.18	0.32	0.46	0.94	1.46	2.67	1002	2.5	0.0	2.5	0.18	0.32	0.46	0.94	1.46	2.67
1002	2.4	0.0	2.4	0.18	0.32	0.46	0.94	1.46	2.67	1003	4.9	0.0	4.9	0.18	0.32	0.46	0.94	1.46	2.67
1003	3.3	0.0	3.3	0.18	0.32	0.46	0.94	1.46	2.67	1004	8.2	0.0	8.2	0.18	0.32	0.46	0.94	1.46	2.67
1004	5.5	0.0	5.5	0.18	0.32	0.46	0.94	1.46	2.67	1005	13.7	0.0	13.7	0.18	0.32	0.46	0.94	1.46	2.67
1005	7.8	0.0	7.8	0.18	0.32	0.46	0.94	1.46	2.67	1006	21.5	0.0	21.5	0.18	0.32	0.46	0.94	1.46	2.67
1006	10.1	0.0	10.1	0.18	0.32	0.46	0.94	1.46	2.67	1007	31.6	0.0	31.6	0.18	0.32	0.46	0.94	1.46	2.67
1007	19.2	0.0	19.2	0.18	0.32	0.46	0.94	1.46	2.67	1008	50.8	0.0	50.8	0.18	0.32	0.46	0.94	1.46	2.67
1008	32.5	0.0	32.5	0.18	0.32	0.46	0.94	1.46	2.67	1009	83.3	0.0	83.3	0.18	0.32	0.46	0.94	1.46	2.67
1009	43.3	0.0	43.3	0.18	0.32	0.46	0.94	1.46	2.67	1010	126.6	0.0	126.6	0.18	0.32	0.46	0.94	1.46	2.67
1010	77.7	0.0	77.7	0.18	0.32	0.46	0.94	1.46	2.67	1011	204.3	0.0	204.3	0.18	0.32	0.46	0.94	1.46	2.67
1011	26.0	0.0	26.0	0.18	0.32	0.46	0.94	1.46	2.67	1012	230.3	0.0	230.3	0.18	0.32	0.46	0.94	1.46	2.67
1012	24.7	0.0	24.7	0.18	0.32	0.46	0.94	1.46	2.67	1013	255.0	0.0	255.0	0.18	0.32	0.46	0.94	1.46	2.67
1013	81.9	0.0	81.9	0.18	0.32	0.46	0.94	1.46	2.67	1014	336.9	0.0	336.9	0.18	0.32	0.46	0.94	1.46	2.67
1014	16.0	0.0	16.0	0.18	0.32	0.46	0.94	1.46	2.67	1015	352.9	0.0	352.9	0.18	0.32	0.46	0.94	1.46	2.67
1015	36.7	0.0	36.7	0.18	0.32	0.46	0.94	1.46	2.67										
1020	0.9	0.0	0.9	0.18	0.32	0.46	0.94	1.46	2.67	1021	1.3	0.0	1.3	0.18	0.32	0.46	0.94	1.46	2.67
1021	0.8	0.0	0.8	0.18	0.32	0.46	0.94	1.46	2.67	1022	2.1	0.0	2.1	0.18	0.32	0.46	0.94	1.46	2.67
1022	1.2	0.0	1.2	0.18	0.32	0.46	0.94	1.46	2.67	1023	3.3	0.0	3.3	0.18	0.32	0.46	0.94	1.46	2.67
1023	0.7	0.0	0.7	0.18	0.32	0.46	0.94	1.46	2.67	1024	4.0	0.0	4.0	0.18	0.32	0.46	0.94	1.46	2.67
1024	3.1	0.0	3.1	0.18	0.32	0.46	0.94	1.46	2.67	1025	7.1	0.0	7.1	0.18	0.32	0.46	0.94	1.46	2.67
1025	3.3	0.0	3.3	0.18	0.32	0.46	0.94	1.46	2.67	1026	10.4	0.0	10.4	0.18	0.32	0.46	0.94	1.46	2.67
1026	7.0	0.0	7.0	0.18	0.32	0.46	0.94	1.46	2.67	1027	17.4	0.0	17.4	0.18	0.32	0.46	0.94	1.46	2.67
1027	3.2	0.0	3.2	0.18	0.32	0.46	0.94	1.46	2.67	1028	20.6	0.0	20.6	0.18	0.32	0.46	0.94	1.46	2.67
1028	17.8	0.0	17.8	0.18	0.32	0.46	0.94	1.46	2.67	1029	38.4	0.0	38.4	0.18	0.32	0.46	0.94	1.46	2.67
1029	31.5	0.0	31.5	0.18	0.32	0.46	0.94	1.46	2.67	1030	69.9	0.0	69.9	0.18	0.32	0.46	0.94	1.46	2.67
1030	55.9	0.0	55.9	0.18	0.32	0.46	0.94	1.46	2.67	1031	125.8	0.0	125.8	0.18	0.32	0.46	0.94	1.46	2.67
1031	109.5	0.0	109.5	0.18	0.32	0.46	0.94	1.46	2.67	1032	235.3	0.0	235.3	0.18	0.32	0.46	0.94	1.46	2.67
1032	36.2	0.0	36.2	0.18	0.32	0.46	0.94	1.46	2.67	1033	271.5	0.0	271.5	0.18	0.32	0.46	0.94	1.46	2.67
1033	31.7	0.0	31.7	0.18	0.32	0.46	0.94	1.46	2.67	1034	303.2	0.0	303.2	0.18	0.32	0.46	0.94	1.46	2.67
1034	133.6	0.0	133.6	0.18	0.32	0.46	0.94	1.46	2.67	1035	826.4	0.0	826.4	0.18	0.32	0.46	0.94	1.46	2.67
1035	53.2	0.0	53.2	0.18	0.32	0.46	0.94	1.46	2.67	1036	879.6	0.0	879.6	0.18	0.32	0.46	0.94	1.46	2.67

## Rainfall Depths

### 2-Year - Expected Value - Upstream Areas

Subarea	Area			Rainfall Depth						Node	Area			Rainfall Depth					
	(ac)	< 2000 (ac)	> 2000 (ac)	5-min	30-min	1-hr	3-hr	6-hr	24-hr		(ac)	< 2000 (ac)	> 2000 (ac)	5-min	30-min	1-hr	3-hr	6-hr	24-hr
		X		0.13	0.28	0.37	0.62	0.85	1.44			X		0.13	0.28	0.37	0.62	0.85	1.44
			X	0.18	0.32	0.46	0.94	1.46	2.67			X		0.18	0.32	0.46	0.94	1.46	2.67
1036	96.7	0.0	96.7	0.18	0.32	0.46	0.94	1.46	2.67	1037	976.3	0.0	976.3	0.18	0.32	0.46	0.94	1.46	2.67
1037	165.6	0.0	165.6	0.18	0.32	0.46	0.94	1.46	2.67	1038	1,141.9	0.0	1,141.9	0.18	0.32	0.46	0.94	1.46	2.67
1038	102.5	0.0	102.5	0.18	0.32	0.46	0.94	1.46	2.67	1039	1,244.4	0.0	1,244.4	0.18	0.32	0.46	0.94	1.46	2.67
1039	115.0	0.0	115.0	0.18	0.32	0.46	0.94	1.46	2.67	1040	1,359.4	0.0	1,359.4	0.18	0.32	0.46	0.94	1.46	2.67
1040	218.1	0.0	218.1	0.18	0.32	0.46	0.94	1.46	2.67	1041	1,577.5	0.0	1,577.5	0.18	0.32	0.46	0.94	1.46	2.67
1041	194.4	0.0	194.4	0.18	0.32	0.46	0.94	1.46	2.67	1042	1,771.9	0.0	1,771.9	0.18	0.32	0.46	0.94	1.46	2.67
1042	156.0	5.3	150.7	0.18	0.32	0.46	0.93	1.44	2.63	1043	1,927.9	5.3	1,922.6	0.18	0.32	0.46	0.94	1.46	2.67
1043	89.5	8.2	81.3	0.18	0.32	0.45	0.91	1.40	2.56	1044	2,017.4	13.5	2,003.9	0.18	0.32	0.46	0.94	1.46	2.66
1044	318.0	46.7	271.3	0.17	0.31	0.45	0.89	1.37	2.49	1045	2,335.4	60.2	2,275.2	0.18	0.32	0.46	0.93	1.44	2.64
1045	110.6	51.5	59.1	0.16	0.30	0.42	0.79	1.18	2.10	1046	2,446.0	111.7	2,334.3	0.18	0.32	0.46	0.93	1.43	2.61
1046	1,855.8	39.8	1,816.0	0.18	0.32	0.46	0.93	1.45	2.64	1047	4,301.8	151.5	4,150.3	0.18	0.32	0.46	0.93	1.44	2.63
1047	2,825.3	45.9	2,779.4	0.18	0.32	0.46	0.93	1.45	2.65	1048	7,127.1	197.4	6,929.7	0.18	0.32	0.46	0.93	1.44	2.64
1048	1,002.1	197.7	804.4	0.17	0.31	0.44	0.88	1.34	2.43	1049	8,129.2	395.1	7,734.1	0.18	0.32	0.46	0.92	1.43	2.61
1049	1,386.9	160.0	1,226.9	0.17	0.32	0.45	0.90	1.39	2.53	1050	9,516.1	555.1	8,961.0	0.18	0.32	0.45	0.92	1.42	2.60
1050	460.3	103.7	356.6	0.17	0.31	0.44	0.87	1.32	2.39	1051	9,976.4	658.8	9,317.6	0.18	0.32	0.45	0.92	1.42	2.59
1051	751.7	342.1	409.6	0.16	0.30	0.42	0.79	1.18	2.11	1052	10,728.1	1,000.9	9,727.2	0.18	0.32	0.45	0.91	1.40	2.56
1052	2,093.6	251.0	1,842.6	0.17	0.32	0.45	0.90	1.39	2.52	1053	12,821.7	1,251.9	11,569.8	0.18	0.32	0.45	0.91	1.40	2.55
1053	806.2	334.8	471.4	0.16	0.30	0.42	0.81	1.21	2.16	1054	13,627.9	1,586.7	12,041.2	0.17	0.32	0.45	0.90	1.39	2.53
1054	1,031.5	558.9	472.6	0.15	0.30	0.41	0.77	1.13	2.00	1055	14,659.4	2,145.6	12,513.8	0.17	0.31	0.45	0.89	1.37	2.49
1055	2,235.0	922.0	1,313.0	0.16	0.30	0.42	0.81	1.21	2.16	1056	16,894.4	3,067.6	13,826.8	0.17	0.31	0.44	0.88	1.35	2.45
1056	529.0	485.4	43.6	0.13	0.28	0.38	0.65	0.90	1.54	1057	17,423.4	3,553.0	13,870.4	0.17	0.31	0.44	0.87	1.34	2.42
1057	6,465.8	2,416.0	4,049.8	0.16	0.31	0.43	0.82	1.23	2.21	1058	23,889.2	5,969.0	17,920.2	0.17	0.31	0.44	0.86	1.31	2.36
1058	1,581.0	1,203.3	377.7	0.14	0.29	0.39	0.70	1.00	1.73	1059	25,470.2	7,172.3	18,297.9	0.17	0.31	0.43	0.85	1.29	2.32
1059	1,385.9	1,385.9	0.0	0.13	0.28	0.37	0.62	0.85	1.44	1060	26,856.1	8,558.2	18,297.9	0.16	0.31	0.43	0.84	1.27	2.28
1060	5,326.4	3,700.7	1,625.7	0.15	0.29	0.40	0.72	1.04	1.82	1061	32,182.5	12,258.9	19,923.6	0.16	0.30	0.43	0.82	1.23	2.20
1061	14,256.1	10,745.9	3,510.2	0.14	0.29	0.39	0.70	1.00	1.74	1062	46,438.6	23,004.8	23,433.8	0.16	0.30	0.42	0.78	1.16	2.06

## Channel Hydraulics, Travel Times, Times of Concentration, and Lag Estimates 2-Year - Expected Value - Upstream Areas

U/S Node	D/S Node	U/S Elevation	D/S Elevation	Length (ft)	Manning (n)	Base (ft)	Sideslope (z)	Height (ft)	Q(2) (cfs)	Dn (ft)	V (fps)	Tt (min)	Tc (min)	Lag (hr)	
	1035		2840	Data from Rational Method Analysis:						36				63.21	0.84
1035	1036	2840	2800	1878	0.040	10	1	10	151	1.85	6.91	4.53	67.74	0.90	
1036	1037	2800	2760	1959	0.040	10	1	10	152	1.87	6.81	4.79	72.53	0.97	
1037	1038	2760	2700	2116	0.040	10	1	10	158	1.75	7.72	4.57	77.10	1.03	
1038	1039	2700	2600	2298	0.040	10	1	10	179	1.65	9.29	4.12	81.22	1.08	
1039	1040	2600	2400	3287	0.040	10	1	10	185	1.53	10.52	5.21	86.43	1.15	
1040	1041	2400	2200	2212	0.050	10	1	10	205	1.65	10.68	3.45	89.88	1.20	
1041	1042	2200	2000	1708	0.050	10	1	10	232	1.64	12.14	2.35	92.23	1.23	
1042	1043	2000	1990	1322	0.040	20	1	10	252	2.27	4.98	4.42	96.65	1.29	
1043	1044	1990	1980	1681	0.040	25	1	10	273	2.24	4.47	6.27	102.92	1.37	
1044	1045	1980	1960	2360	0.040	25	1	10	273	2.02	5.01	7.85	110.77	1.48	
1045	1046	1960	1915	2743	0.040	25	1	10	296	1.74	6.38	7.17	117.93	1.57	
1046	1047	1915	1910	221	0.040	25	1	10	303	1.60	7.13	0.52	118.45	1.58	
1047	1048	1910	1750	1601	0.050	25	1	10	480	1.54	11.72	2.28	120.73	1.61	
1048	1049	1750	1670	2254	0.050	25	1	15	772	2.80	9.93	3.78	124.51	1.66	
1049	1050	1670	1665	290	0.050	25	1	15	827	3.61	8.00	0.60	125.11	1.67	
1050	1051	1665	1630	2134	0.050	30	1	15	921	3.51	7.82	4.55	129.66	1.73	
1051	1052	1630	1410	5523	0.050	30	1	15	955	2.75	10.59	8.69	138.35	1.84	
1052	1053	1410	1297	2262	0.050	30	1	15	976	2.61	11.49	3.28	141.63	1.89	
1053	1054	1297	1235	3488	0.040	30	1	15	1,131	3.39	9.98	5.82	147.46	1.97	
1054	1055	1235	1115	3993	0.040	30	1	15	1,131	2.90	11.86	5.61	153.07	2.04	
1055	1056	1115	978	4363	0.040	30	1	15	1,162	2.91	12.14	5.99	159.06	2.12	
1056	1057	978	800	5201	0.050	30	1	15	1,254	3.39	11.08	7.83	166.89	2.23	
1057	1058	800	657	5445	0.050	35	1	15	1,254	3.35	9.77	9.29	176.18	2.35	
1058	1059	657	630	2185	0.040	50	1	15	1,529	3.34	8.58	4.24	180.42	2.41	
1059	1060	630	518	7828	0.040	50	1	15	1,529	3.20	8.99	14.51	194.93	2.60	
1060	1061	518	435	8004	0.040	55	1	15	1,529	3.32	7.89	16.91	211.84	2.82	
1061	1062	435	345	8275	0.040	60	1	15	1,545	3.13	7.82	17.63	229.47	3.06	

## Losses

Node U1035  
 Total Area (ac) 826.2  
 24-Hour Rainfall Depth (in) 2.67  
 Fm (in/hr) 0.60  
 Y-Bar 0.74

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	181.4	554.1	90.7	0.0	181.4	554.1	90.7
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.34	0.52	0.66	0.73
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.40
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.40	0.52
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.02	0.19	0.36	0.47
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.38	0.47
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.07	0.22	0.34
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.15	0.32	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.25	0.36
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.32	0.52	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.19	0.36	0.47
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42

## Losses

Node U1036  
 Total Area (ac) 879.4  
 24-Hour Rainfall Depth (in) 2.67  
 Fm (in/hr) 0.60  
 Y-Bar 0.75

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	31.3	21.9	0.0	0.0	212.7	576.0	90.7
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.34	0.52	0.66	0.73
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.40
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.40	0.52
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.02	0.19	0.36	0.47
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.38	0.47
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.07	0.22	0.34
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.15	0.32	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.25	0.36
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.32	0.52	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.19	0.36	0.47
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42

## Losses

Node U1037  
 Total Area (ac) 976.2  
 24-Hour Rainfall Depth (in) 2.67  
 Fm (in/hr) 0.60  
 Y-Bar 0.75

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	40.4	56.4	0.0	0.0	253.1	632.4	90.7
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.34	0.52	0.66	0.73
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.40
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.40	0.52
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.02	0.19	0.36	0.47
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.38	0.47
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.07	0.22	0.34
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.15	0.32	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.25	0.36
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.32	0.52	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.19	0.36	0.47
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42

## Losses

Node U1038  
 Total Area (ac) 1,141.9  
 24-Hour Rainfall Depth (in) 2.67  
 Fm (in/hr) 0.60  
 Y-Bar 0.75

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	17.1	137.1	11.5	0.0	270.2	769.5	102.2
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.34	0.52	0.66	0.73
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.40
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.40	0.52
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.02	0.19	0.36	0.47
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.38	0.47
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.07	0.22	0.34
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.15	0.32	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.25	0.36
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.32	0.52	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.19	0.36	0.47
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42



## Losses

Node U1039  
 Total Area (ac) 1,244.4  
 24-Hour Rainfall Depth (in) 2.67  
 Fm (in/hr) 0.60  
 Y-Bar 0.74

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	3.2	10.5	88.8	0.0	273.4	780.0	191.0
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.34	0.52	0.66	0.73
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.40
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.40	0.52
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.02	0.19	0.36	0.47
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.38	0.47
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.07	0.22	0.34
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.15	0.32	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.25	0.36
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.32	0.52	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.19	0.36	0.47
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42

## Losses

Node U1040  
 Total Area (ac) 1,359.4  
 24-Hour Rainfall Depth (in) 2.67  
 Fm (in/hr) 0.60  
 Y-Bar 0.73

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	0.0	0.0	115.0	0.0	273.4	780.0	306.0
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.34	0.52	0.66	0.73
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.40
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.40	0.52
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.02	0.19	0.36	0.47
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.38	0.47
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.07	0.22	0.34
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.15	0.32	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.25	0.36
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.32	0.52	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.19	0.36	0.47
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42

## Losses

Node U1041  
 Total Area (ac) 1,577.5  
 24-Hour Rainfall Depth (in) 2.67  
 Fm (in/hr) 0.60  
 Y-Bar 0.71

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	0.0	61.2	156.9	0.0	273.4	841.2	462.9
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.34	0.52	0.66	0.73
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.40
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.40	0.52
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.02	0.19	0.36	0.47
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.38	0.47
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.07	0.22	0.34
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.15	0.32	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.25	0.36
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.32	0.52	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.19	0.36	0.47
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42

## Losses

Node U1042  
 Total Area (ac) 1,771.9  
 24-Hour Rainfall Depth (in) 2.67  
 Fm (in/hr) 0.60  
 Y-Bar 0.71

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	0.0	169.6	24.8	0.0	273.4	1,010.8	487.7
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.34	0.52	0.66	0.73
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.40
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.40	0.52
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.02	0.19	0.36	0.47
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.38	0.47
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.07	0.22	0.34
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.15	0.32	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.25	0.36
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.32	0.52	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.19	0.36	0.47
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42

## Losses

Node U1043  
 Total Area (ac) 1,927.8  
 24-Hour Rainfall Depth (in) 2.67  
 Fm (in/hr) 0.60  
 Y-Bar 0.71

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	7.4	0.0	42.5	106.0	7.4	273.4	1,053.3	593.7
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.34	0.52	0.66	0.73
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.40
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.40	0.52
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.02	0.19	0.36	0.47
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.38	0.47
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.07	0.22	0.34
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.15	0.32	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.25	0.36
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.32	0.52	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.19	0.36	0.47
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42

## Losses

Node U1044  
 Total Area (ac) 2,017.4  
 24-Hour Rainfall Depth (in) 2.66  
 Fm (in/hr) 0.60  
 Y-Bar 0.71

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	2.2	0.0	27.6	59.8	9.6	273.4	1,080.9	653.5
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.19	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.34	0.52	0.66	0.73
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.40
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.40	0.52
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.02	0.19	0.36	0.47
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.38	0.47
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.07	0.22	0.34
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.15	0.32	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.25	0.36
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.32	0.52	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.19	0.36	0.47
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.14	0.32	0.42

## Losses

Node U1045  
 Total Area (ac) 2,335.4  
 24-Hour Rainfall Depth (in) 2.64  
 Fm (in/hr) 0.60  
 Y-Bar 0.71

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	40.9	179.4	97.7	9.6	314.3	1,260.3	751.2
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.33	0.51	0.66	0.72
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.40
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.40	0.51
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.37	0.46
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.06	0.21	0.33
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.15	0.31	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.24	0.35
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.31	0.51	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.42

## Losses

Node U1046  
 Total Area (ac) 2,446.0  
 24-Hour Rainfall Depth (in) 2.61  
 Fm (in/hr) 0.60  
 Y-Bar 0.71

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	30.7	79.9	0.0	9.6	345.0	1,340.2	751.2
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.33	0.51	0.66	0.72
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.27	0.39
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.22	0.39	0.51
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.19	0.37	0.46
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.06	0.21	0.33
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.14	0.31	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.24	0.35
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.31	0.51	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.41
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.41



## Losses

Node U1047  
 Total Area (ac) 4,301.8  
 24-Hour Rainfall Depth (in) 2.63  
 Fm (in/hr) 0.60  
 Y-Bar 0.72

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	146.3	1,591.1	118.4	9.6	491.3	2,931.3	869.6
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.33	0.51	0.66	0.72
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.39
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.39	0.51
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.37	0.46
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.06	0.21	0.33
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.14	0.31	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.24	0.35
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.31	0.51	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.42

## Losses

Node U1048  
 Total Area (ac) 7,126.9  
 24-Hour Rainfall Depth (in) 2.64  
 Fm (in/hr) 0.60  
 Y-Bar 0.68

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.4	10.5	2.4	0.0	0.4	10.5	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	3.6	59.5	926.7	805.9	13.2	550.8	3,858.0	1,675.5
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	299.2	567.3	0.0	0.0	299.2	567.3
Grass (Fair)	100	50	69	79	84	0.0	0.1	10.7	3.1	0.0	0.1	10.7	3.1
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	23.3	0.0	0.0	0.0	23.3
Woodland (Fair)	100	36	60	73	79	3.3	16.7	40.4	51.5	3.3	16.7	40.4	51.5
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.28
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.33	0.51	0.66	0.72
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.28	0.40
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.23	0.40	0.51
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.20	0.37	0.46
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.06	0.21	0.33
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.15	0.31	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.24	0.35
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.31	0.51	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.42
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.42

## Losses

Node U1049  
 Total Area (ac) 8,128.9  
 24-Hour Rainfall Depth (in) 2.61  
 Fm (in/hr) 0.60  
 Y-Bar 0.68

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	3.4	0.0	0.0	0.0	3.9	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.4	10.5	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	10.2	267.8	391.5	13.2	561.0	4,125.8	2,067.0
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	2.0	128.1	149.6	0.0	2.0	427.3	716.9
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.1	10.7	3.1
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.3
Woodland (Fair)	100	36	60	73	79	0.0	11.1	4.7	33.6	3.3	27.8	45.1	85.1
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.33	0.51	0.66	0.72
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.27	0.39
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.22	0.39	0.51
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.19	0.37	0.46
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.06	0.21	0.33
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.14	0.31	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.24	0.35
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.31	0.51	0.66	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.41
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.41

## Losses

Node U1050  
 Total Area (ac) 9,515.8  
 24-Hour Rainfall Depth (in) 2.60  
 Fm (in/hr) 0.60  
 Y-Bar 0.69

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.4	10.5	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	41.6	85.7	1,084.0	175.6	54.8	646.7	5,209.8	2,242.6
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	2.0	427.3	716.9
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.1	10.7	3.1
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.3
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	3.3	27.8	45.1	85.1
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.33	0.51	0.65	0.72
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.27	0.39
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.22	0.39	0.51
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.19	0.37	0.46
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.06	0.21	0.33
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.14	0.31	0.44
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.24	0.35
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.31	0.51	0.65	0.76
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.41
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.41

## Losses

Node U1051  
 Total Area (ac) 9,976.1  
 24-Hour Rainfall Depth (in) 2.59  
 Fm (in/hr) 0.60  
 Y-Bar 0.69

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.4	10.5	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	0.0	297.0	163.3	54.8	646.7	5,506.8	2,405.9
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	0.0	2.0	427.3	716.9
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.1	10.7	3.1
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.3
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	3.3	27.8	45.1	85.1
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.05	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.33	0.51	0.65	0.72
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.11	0.27	0.39
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.22	0.39	0.51
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.19	0.37	0.46
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.06	0.21	0.33
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.14	0.31	0.43
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.08	0.24	0.35
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.31	0.51	0.65	0.75
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.41
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.18	0.35	0.46
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.31	0.41

## Losses

Node U1052  
 Total Area (ac) 10,727.7  
 24-Hour Rainfall Depth (in) 2.56  
 Fm (in/hr) 0.60  
 Y-Bar 0.69

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	3.9	0.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.4	10.5	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	19.1	0.0	198.4	507.4	73.9	646.7	5,705.2	2,913.3
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	26.7	0.0	2.0	427.3	743.6
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.1	10.7	3.1
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	0.0	0.0	0.0	0.0	0.0	23.3
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	0.0	3.3	27.8	45.1	85.1
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.18	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.32	0.50	0.65	0.72
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.10	0.27	0.38
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.22	0.38	0.50
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.18	0.34	0.45
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.19	0.36	0.45
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.06	0.20	0.32
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.14	0.30	0.43
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.07	0.23	0.34
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.30	0.50	0.65	0.75
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.30	0.41
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.18	0.34	0.45
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.13	0.30	0.41

## Losses

Node U1053  
 Total Area (ac) 12,821.3  
 24-Hour Rainfall Depth (in) 2.55  
 Fm (in/hr) 0.60  
 Y-Bar 0.68

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	21.4	2.9	0.0	0.0	25.3	2.9
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.2	0.7	0.0	0.0	0.2	0.7
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.7	0.0	0.0	0.4	11.2	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	4.5	214.7	717.0	73.9	651.2	5,919.9	3,630.3
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	2.2	85.0	674.4	0.0	4.2	512.3	1,418.0
Grass (Fair)	100	50	69	79	84	0.0	0.0	7.6	10.2	0.0	0.1	18.3	13.3
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	35.4	44.5	0.0	0.0	35.4	67.8
Woodland (Fair)	100	36	60	73	79	0.0	31.4	92.5	148.3	3.3	59.2	137.6	233.4
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.27
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.32	0.50	0.65	0.72
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.10	0.27	0.38
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.04	0.22	0.38	0.50
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.17	0.34	0.45
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.02	0.19	0.36	0.45
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.06	0.20	0.32
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.14	0.30	0.43
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.07	0.23	0.34
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.30	0.50	0.65	0.75
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.12	0.30	0.41
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.17	0.34	0.45
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.12	0.30	0.41

## Losses

Node U1054  
 Total Area (ac) 13,627.5  
 24-Hour Rainfall Depth (in) 2.53  
 Fm (in/hr) 0.60  
 Y-Bar 0.68

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	25.3	2.9
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.4	11.2	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	0.0	435.0	271.3	73.9	651.2	6,354.9	3,901.6
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	36.0	5.3	0.0	4.2	548.3	1,423.3
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.1	18.3	13.3
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	7.8	26.9	0.0	0.0	43.2	94.7
Woodland (Fair)	100	36	60	73	79	0.0	0.0	10.2	13.7	3.3	59.2	147.8	247.1
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.26
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.26
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.26
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.26
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.26
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.32	0.50	0.65	0.71
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.10	0.26	0.38
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.03	0.22	0.38	0.50
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.17	0.34	0.45
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.01	0.19	0.36	0.45
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.06	0.20	0.32
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.13	0.30	0.43
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.07	0.23	0.34
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.30	0.50	0.65	0.75
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.12	0.30	0.40
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.17	0.34	0.45
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.12	0.30	0.40



## Losses

Node U1055  
 Total Area (ac) 14,658.9  
 24-Hour Rainfall Depth (in) 2.49  
 Fm (in/hr) 0.60  
 Y-Bar 0.68

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	25.3	2.9
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.4	11.2	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	0.0	43.8	659.6	73.9	651.2	6,398.7	4,561.2
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	35.8	86.6	0.0	4.2	584.1	1,509.9
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.1	18.3	13.3
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	21.4	129.7	0.0	0.0	64.6	224.4
Woodland (Fair)	100	36	60	73	79	0.0	0.0	11.1	43.4	3.3	59.2	158.9	290.5
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.26
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.26
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.26
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.26
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.17	0.26
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.31	0.50	0.64	0.71
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.10	0.26	0.38
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.03	0.21	0.38	0.50
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.17	0.33	0.45
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.01	0.18	0.35	0.45
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.05	0.20	0.31
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.13	0.29	0.42
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.07	0.23	0.33
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.29	0.50	0.64	0.75
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.12	0.29	0.40
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.17	0.33	0.45
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.12	0.29	0.40

## Losses

Node U1056  
 Total Area (ac) 16,893.7  
 24-Hour Rainfall Depth (in) 2.45  
 Fm (in/hr) 0.60  
 Y-Bar 0.68

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	25.3	2.9
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.4	11.2	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	11.5	566.6	433.4	73.9	662.7	6,965.3	4,994.6
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	2.9	601.9	298.4	0.0	7.1	1,186.0	1,808.3
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.1	18.3	13.3
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	9.1	116.9	0.0	0.0	73.7	341.3
Woodland (Fair)	100	36	60	73	79	0.0	15.1	84.6	94.4	3.3	74.3	243.5	384.9
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.16	0.25
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.16	0.25
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.16	0.25
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.16	0.25
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.16	0.25
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.31	0.49	0.64	0.71
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.09	0.25	0.37
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.03	0.21	0.37	0.49
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.16	0.33	0.44
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.01	0.18	0.35	0.44
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.05	0.19	0.31
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.13	0.29	0.42
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.07	0.22	0.33
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.29	0.49	0.64	0.74
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.11	0.29	0.39
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.16	0.33	0.44
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.11	0.29	0.39

## Losses

Node U1057  
 Total Area (ac) 17,422.5  
 24-Hour Rainfall Depth (in) 2.45  
 Fm (in/hr) 0.60  
 Y-Bar 0.68

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	25.3	2.9
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	0.0	0.4	11.2	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	0.0	2.0	208.8	73.9	662.7	6,967.3	5,203.4
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.3	63.6	0.0	7.1	1,186.3	1,871.9
Grass (Fair)	100	50	69	79	84	0.0	0.0	0.0	0.0	0.0	0.1	18.3	13.3
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.9	0.0	0.0	0.0	0.9	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	0.0	0.0	40.2	155.2	0.0	0.0	113.9	496.5
Woodland (Fair)	100	36	60	73	79	0.0	0.0	0.0	57.8	3.3	74.3	243.5	442.7
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.16	0.25
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.16	0.25
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.16	0.25
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.16	0.25
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.04	0.16	0.25
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.91	0.91	0.91	0.91
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.31	0.49	0.64	0.71
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.09	0.25	0.37
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.03	0.21	0.37	0.49
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.16	0.33	0.44
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.01	0.18	0.35	0.44
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.05	0.19	0.31
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.13	0.29	0.42
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.07	0.22	0.33
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.29	0.49	0.64	0.74
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.11	0.29	0.39
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.01	0.16	0.33	0.44
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.11	0.29	0.39

## Losses

Node U1058  
 Total Area (ac) 23,888.1  
 24-Hour Rainfall Depth (in) 2.36  
 Fm (in/hr) 0.60  
 Y-Bar 0.68

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	2.2	1.1	0.9	0.0	2.2	1.1	0.9
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.7	1.3	0.4	0.9	0.7	1.3	25.7	3.8
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
Barren (Poor)	100	78	86	91	93	0.0	2.4	0.0	0.0	0.0	2.8	11.2	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	96.5	37.5	1,027.5	1,472.4	170.4	700.2	7,994.8	6,675.8
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	30.0	15.7	572.5	1,735.7	30.0	22.8	1,758.8	3,607.6
Grass (Fair)	100	50	69	79	84	0.0	17.5	17.0	2.1	0.0	17.6	35.3	15.4
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	2.9	0.0	0.0	0.0	3.8	0.0
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	12.0	0.0	163.5	407.8	12.0	0.0	277.4	904.3
Woodland (Fair)	100	36	60	73	79	91.0	206.3	252.8	295.0	94.3	280.6	496.3	737.7
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.15	0.24
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.15	0.24
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.15	0.24
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.15	0.24
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.15	0.24
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.30	0.48	0.63	0.70
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.08	0.24	0.36
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.02	0.19	0.36	0.48
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.01	0.15	0.32	0.43
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.01	0.17	0.34	0.43
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.04	0.18	0.30
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.12	0.28	0.40
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.06	0.21	0.32
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.28	0.48	0.63	0.74
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.10	0.28	0.38
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.15	0.32	0.43
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.10	0.28	0.38

## Losses

Node U1059  
 Total Area (ac) 25,469.0  
 24-Hour Rainfall Depth (in) 2.32  
 Fm (in/hr) 0.60  
 Y-Bar 0.69

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	0.7	0.0	3.4	0.0	2.9	1.1	4.3
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.7	1.3	25.7	3.8
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
Barren (Poor)	100	78	86	91	93	0.0	0.0	3.8	0.0	0.0	2.8	15.0	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	21.3	0.0	403.9	289.7	191.7	700.2	8,398.7	6,965.5
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	8.9	0.0	167.5	287.3	38.9	22.8	1,926.3	3,894.9
Grass (Fair)	100	50	69	79	84	0.0	0.0	7.0	0.1	0.0	17.6	42.3	15.5
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.2	0.0	0.0	3.8	0.2
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	15.8	0.0	145.4	117.7	27.8	0.0	422.8	1,022.0
Woodland (Fair)	100	36	60	73	79	23.8	2.5	36.9	45.0	118.1	283.1	533.2	782.7
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.15	0.24
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.15	0.24
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.15	0.24
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.15	0.24
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.15	0.24
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.29	0.47	0.62	0.69
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.08	0.24	0.35
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.02	0.19	0.35	0.47
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.15	0.31	0.42
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.01	0.16	0.33	0.42
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.04	0.17	0.29
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.11	0.27	0.40
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.05	0.20	0.31
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.27	0.47	0.62	0.73
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.10	0.27	0.37
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.15	0.31	0.42
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.10	0.27	0.37

## Losses

Node U1060  
 Total Area (ac) 26,854.8  
 24-Hour Rainfall Depth (in) 2.28  
 Fm (in/hr) 0.60  
 Y-Bar 0.70

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	3.7	5.1	1.3	1.7	3.7	8.0	2.4	6.0
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	0.0	0.0	0.7	1.3	25.7	3.8
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
Barren (Poor)	100	78	86	91	93	0.0	0.0	2.5	0.0	0.0	2.8	17.5	2.4
Chaparral, Broadleaf (Fair)	100	40	63	75	81	37.8	17.6	209.7	46.1	229.5	717.8	8,608.4	7,011.6
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.2	0.0	6.1	38.0	39.1	22.8	1,932.4	3,932.9
Grass (Fair)	100	50	69	79	84	0.0	1.3	28.4	30.1	0.0	18.9	70.7	45.6
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.2
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	124.1	11.8	502.6	129.8	151.9	11.8	925.4	1,151.8
Woodland (Fair)	100	36	60	73	79	68.9	18.0	9.9	91.1	187.0	301.1	543.1	873.8
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.14	0.23
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.14	0.23
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.14	0.23
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.14	0.23
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.03	0.14	0.23
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.28	0.47	0.62	0.69
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.08	0.23	0.35
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.02	0.18	0.35	0.47
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.14	0.30	0.42
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.01	0.16	0.32	0.42
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.04	0.17	0.28
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.11	0.27	0.39
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.05	0.20	0.30
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.27	0.47	0.62	0.73
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.10	0.27	0.37
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.14	0.30	0.42
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.10	0.27	0.37

## Losses

Node U1061  
 Total Area (ac) 32,181.3  
 24-Hour Rainfall Depth (in) 2.20  
 Fm (in/hr) 0.60  
 Y-Bar 0.71

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	8.1	2.9	0.1	3.6	11.8	10.9	2.5	9.6
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	9.1	0.0	17.1	23.6	9.8	1.3	42.8	27.4
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.7
Barren (Poor)	100	78	86	91	93	0.2	0.0	18.2	34.2	0.2	2.8	35.7	36.6
Chaparral, Broadleaf (Fair)	100	40	63	75	81	72.7	0.0	1,119.8	1,067.4	302.2	717.8	9,728.2	8,079.0
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	8.7	1.6	195.3	574.7	47.8	24.4	2,127.7	4,507.6
Grass (Fair)	100	50	69	79	84	4.0	0.8	128.6	99.7	4.0	19.7	199.3	145.3
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.2
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Open Brush (Fair)	100	46	66	77	83	97.5	18.3	739.9	651.2	249.4	30.1	1,665.3	1,803.0
Woodland (Fair)	100	36	60	73	79	70.5	16.2	132.2	210.3	257.5	317.3	675.3	1,084.1
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.02	0.13	0.22
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.02	0.13	0.22
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.02	0.13	0.22
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.02	0.13	0.22
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.02	0.13	0.22
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.90	0.90	0.90	0.90
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.27	0.46	0.61	0.68
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.07	0.22	0.33
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.02	0.17	0.33	0.46
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.13	0.29	0.40
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.15	0.31	0.40
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.03	0.16	0.27
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.10	0.25	0.38
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.05	0.19	0.29
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.25	0.46	0.61	0.72
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.09	0.25	0.36
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.13	0.29	0.40
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.09	0.25	0.36

## Losses

Node U1062  
 Total Area (ac) 46,437.3  
 24-Hour Rainfall Depth (in) 2.06  
 Fm (in/hr) 0.59  
 Y-Bar 0.72

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	5.6	64.5	161.3	225.3	17.4	75.4	163.8	234.9
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	1.0	2.3	6.9	0.8	10.8	3.6	49.7	28.2
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	6.2	8.7	2.9	0.0	6.2	8.9	3.6
Barren (Poor)	100	78	86	91	93	6.9	5.0	40.7	84.9	7.1	7.8	76.4	121.5
Chaparral, Broadleaf (Fair)	100	40	63	75	81	36.5	13.8	1,292.0	1,418.6	338.7	731.6	#####	9,497.6
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	1.8	17.1	389.3	1,546.1	49.6	41.5	2,517.0	6,053.7
Grass (Fair)	100	50	69	79	84	60.3	51.1	190.1	865.2	64.3	70.8	389.4	1,010.5
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	3.1	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.2
Open Brush (Fair)	100	46	66	77	83	138.5	258.2	2,310.8	2,760.5	387.9	288.3	3,976.1	4,563.5
Woodland (Fair)	100	36	60	73	79	444.4	74.1	636.8	963.3	701.9	391.4	1,312.1	2,047.4
Fallow (Poor)	100	77	86	91	94	0.0	2.7	0.0	0.0	0.0	2.7	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	2.2	0.0	0.0	0.2	2.2	0.0	0.0	0.2
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	1.3	10.0	87.0	57.8	1.3	10.0	87.0	57.8

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.12	0.20
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.12	0.20
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.12	0.20
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.12	0.20
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.12	0.20
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.25	0.43	0.59	0.66
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.06	0.20	0.31
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.01	0.15	0.31	0.43
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.12	0.27	0.38
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.13	0.29	0.38
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.02	0.14	0.25
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.08	0.23	0.36
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.03	0.17	0.27
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.23	0.43	0.59	0.71
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.23	0.33
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.12	0.27	0.38
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.23	0.33



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LU35002E.DAT  
TIME/DATE OF STUDY: 10:35 04/01/2004  
=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--

USER SPECIFIED STORM EVENT(YEAR) = 2.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	2.450
2)	10.000;	1.440
3)	15.000;	1.090
4)	20.000;	0.840
5)	30.000;	0.630
6)	60.000;	0.460
7)	120.000;	0.350

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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 0.0312 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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1000.00 TO NODE 1001.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00  
ELEVATION DATA: UPSTREAM(FEET) = 3210.00 DOWNSTREAM(FEET) = 3190.00  
  
 $T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$   
SUBAREA ANALYSIS USED MINIMUM  $T_c$ (MIN.) = 12.581  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.333  
SUBAREA  $T_c$  AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA  $F_p$   $A_p$  SCS  $T_c$   
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER

"CHAPARRAL,BROADLEAF" - 1.30 0.60 1.00 0 12.58  
SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.00  
SUBAREA RUNOFF(CFS) = 0.86  
TOTAL AREA(ACRES) = 1.30 PEAK FLOW RATE(CFS) = 0.86

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1001.00 TO NODE 1002.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3190.00 DOWNSTREAM(FEET) = 3175.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 154.00 CHANNEL SLOPE = 0.0974  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 0.86  
FLOW VELOCITY(FEET/SEC.) = 2.89 FLOW DEPTH(FEET) = 0.24  
TRAVEL TIME(MIN.) = 0.89  $T_c$ (MIN.) = 13.47  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1002.00 = 484.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1001.00 TO NODE 1002.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE  $T_c$ (MIN) = 13.47  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.197  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA  $F_p$   $A_p$  SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 1.20 0.60 1.00 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.00  
SUBAREA AREA(ACRES) = 1.20 SUBAREA RUNOFF(CFS) = 0.65  
EFFECTIVE AREA(ACRES) = 2.50 AREA-AVERAGED  $F_m$ (INCH/HR) = 0.60  
AREA-AVERAGED  $F_p$ (INCH/HR) = 0.60 AREA-AVERAGED  $A_p$  = 1.00  
TOTAL AREA(ACRES) = 2.50 PEAK FLOW RATE(CFS) = 1.34

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1002.00 TO NODE 1003.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3175.00 DOWNSTREAM(FEET) = 3160.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 136.00 CHANNEL SLOPE = 0.1103  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1.34  
FLOW VELOCITY(FEET/SEC.) = 3.52 FLOW DEPTH(FEET) = 0.29  
TRAVEL TIME(MIN.) = 0.64  $T_c$ (MIN.) = 14.11  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1003.00 = 620.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1002.00 TO NODE 1003.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE  $T_c$ (MIN) = 14.11  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.152  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA  $F_p$   $A_p$  SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 0.30 0.60 1.00 -  
USER-DEFINED - 2.10 0.60 1.00 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE,  $F_p$ (INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION,  $A_p$  = 1.00

SUBAREA AREA(ACRES) = 2.40 SUBAREA RUNOFF(CFS) = 1.19  
EFFECTIVE AREA(ACRES) = 4.90 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4.90 PEAK FLOW RATE(CFS) = 2.44

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1003.00 TO NODE 1004.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) =	3160.00	DOWNSTREAM(FEET) =	3120.00
CHANNEL LENGTH THRU SUBAREA(FEET) =	357.00	CHANNEL SLOPE =	0.1120
CHANNEL BASE(FEET) =	2.00	"Z" FACTOR =	1.000
MANNING'S FACTOR =	0.050	MAXIMUM DEPTH(FEET) =	2.00
CHANNEL FLOW THRU SUBAREA(CFS) =	2.44		
FLOW VELOCITY(FEET/SEC.) =	3.74	FLOW DEPTH(FEET) =	0.29
TRAVEL TIME(MIN.) =	1.59	Tc(MIN.) =	15.70
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE	1004.00 =	977.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1003.00 TO NODE 1004.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 15.70  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.055  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	0.10	0.60	1.00	-
USER-DEFINED	-	3.20	0.60	1.00	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 3.30 SUBAREA RUNOFF(CFS) = 1.35  
EFFECTIVE AREA(ACRES) = 8.20 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 8.20 PEAK FLOW RATE(CFS) = 3.36

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1004.00 TO NODE 1005.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) =	3120.00	DOWNSTREAM(FEET) =	3100.00
CHANNEL LENGTH THRU SUBAREA(FEET) =	332.00	CHANNEL SLOPE =	0.0602
CHANNEL BASE(FEET) =	2.00	"Z" FACTOR =	1.000
MANNING'S FACTOR =	0.050	MAXIMUM DEPTH(FEET) =	2.00
CHANNEL FLOW THRU SUBAREA(CFS) =	3.36		
FLOW VELOCITY(FEET/SEC.) =	3.35	FLOW DEPTH(FEET) =	0.41
TRAVEL TIME(MIN.) =	1.65	Tc(MIN.) =	17.35
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE	1005.00 =	1309.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1004.00 TO NODE 1005.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 17.35  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.972  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	5.50	0.60	1.00	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 5.50 SUBAREA RUNOFF(CFS) = 1.84

EFFECTIVE AREA(ACRES) = 13.70 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 13.70 PEAK FLOW RATE(CFS) = 4.59

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1005.00 TO NODE 1006.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) =	3100.00	DOWNSTREAM(FEET) =	3080.00
CHANNEL LENGTH THRU SUBAREA(FEET) =	195.00	CHANNEL SLOPE =	0.1026
CHANNEL BASE(FEET) =	2.00	"Z" FACTOR =	1.000
MANNING'S FACTOR =	0.050	MAXIMUM DEPTH(FEET) =	2.00
CHANNEL FLOW THRU SUBAREA(CFS) =	4.59		
FLOW VELOCITY(FEET/SEC.) =	4.46	FLOW DEPTH(FEET) =	0.42
TRAVEL TIME(MIN.) =	0.73	Tc(MIN.) =	18.08
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE	1006.00 =	1504.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1005.00 TO NODE 1006.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 18.08  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.936  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	7.80	0.60	1.00	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 7.80 SUBAREA RUNOFF(CFS) = 2.36  
EFFECTIVE AREA(ACRES) = 21.50 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 21.50 PEAK FLOW RATE(CFS) = 6.50

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1006.00 TO NODE 1007.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) =	3080.00	DOWNSTREAM(FEET) =	3075.00
CHANNEL LENGTH THRU SUBAREA(FEET) =	220.00	CHANNEL SLOPE =	0.0227
CHANNEL BASE(FEET) =	3.00	"Z" FACTOR =	1.000
MANNING'S FACTOR =	0.050	MAXIMUM DEPTH(FEET) =	3.00
CHANNEL FLOW THRU SUBAREA(CFS) =	6.50		
FLOW VELOCITY(FEET/SEC.) =	2.77	FLOW DEPTH(FEET) =	0.64
TRAVEL TIME(MIN.) =	1.32	Tc(MIN.) =	19.41
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE	1007.00 =	1724.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1006.00 TO NODE 1007.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 19.41  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.870  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
USER-DEFINED	-	10.10	0.60	1.00	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 10.10 SUBAREA RUNOFF(CFS) = 2.45  
EFFECTIVE AREA(ACRES) = 31.60 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

```

TOTAL AREA(ACRES) = 31.60 PEAK FLOW RATE(CFS) = 7.67
*****
FLOW PROCESS FROM NODE 1007.00 TO NODE 1008.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3075.00 DOWNSTREAM(FEET) = 3060.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 340.00 CHANNEL SLOPE = 0.0441
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00
CHANNEL FLOW THRU SUBAREA(CFS) = 7.67
FLOW VELOCITY(FEET/SEC.) = 3.66 FLOW DEPTH(FEET) = 0.58
TRAVEL TIME(MIN.) = 1.55 Tc(MIN.) = 20.95
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1008.00 = 2064.00 FEET.

*****
FLOW PROCESS FROM NODE 1007.00 TO NODE 1008.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 20.95
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.820
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 14.60 0.60 1.00 -
USER-DEFINED - 4.60 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 19.20 SUBAREA RUNOFF(CFS) = 3.80
EFFECTIVE AREA(ACRES) = 50.80 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 50.80 PEAK FLOW RATE(CFS) = 10.06

*****
FLOW PROCESS FROM NODE 1008.00 TO NODE 1009.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3060.00 DOWNSTREAM(FEET) = 3040.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 409.00 CHANNEL SLOPE = 0.0489
CHANNEL BASE(FEET) = 4.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 4.00
CHANNEL FLOW THRU SUBAREA(CFS) = 10.06
FLOW VELOCITY(FEET/SEC.) = 3.93 FLOW DEPTH(FEET) = 0.56
TRAVEL TIME(MIN.) = 1.74 Tc(MIN.) = 22.69
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1009.00 = 2473.00 FEET.

*****
FLOW PROCESS FROM NODE 1008.00 TO NODE 1009.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 22.69
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.784
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 9.60 0.60 1.00 -
USER-DEFINED - 22.90 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 32.50 SUBAREA RUNOFF(CFS) = 5.37
EFFECTIVE AREA(ACRES) = 83.30 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00

```

```

TOTAL AREA(ACRES) = 83.30 PEAK FLOW RATE(CFS) = 13.77
*****
FLOW PROCESS FROM NODE 1009.00 TO NODE 1010.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3040.00 DOWNSTREAM(FEET) = 3000.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1354.00 CHANNEL SLOPE = 0.0295
CHANNEL BASE(FEET) = 5.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 5.00
CHANNEL FLOW THRU SUBAREA(CFS) = 13.77
FLOW VELOCITY(FEET/SEC.) = 3.50 FLOW DEPTH(FEET) = 0.69
TRAVEL TIME(MIN.) = 6.45 Tc(MIN.) = 29.14
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1010.00 = 3827.00 FEET.

*****
FLOW PROCESS FROM NODE 1009.00 TO NODE 1010.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 29.14
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.648
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 22.50 0.60 1.00 -
USER-DEFINED - 20.80 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 43.30 SUBAREA RUNOFF(CFS) = 1.88
EFFECTIVE AREA(ACRES) = 126.60 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 126.60 PEAK FLOW RATE(CFS) = 13.77
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

*****
FLOW PROCESS FROM NODE 1010.00 TO NODE 1011.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3000.00 DOWNSTREAM(FEET) = 2960.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1293.00 CHANNEL SLOPE = 0.0309
CHANNEL BASE(FEET) = 5.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 5.00
CHANNEL FLOW THRU SUBAREA(CFS) = 13.77
FLOW VELOCITY(FEET/SEC.) = 3.55 FLOW DEPTH(FEET) = 0.68
TRAVEL TIME(MIN.) = 6.06 Tc(MIN.) = 35.20
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1011.00 = 5120.00 FEET.

*****
FLOW PROCESS FROM NODE 1010.00 TO NODE 1011.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 35.20
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.601
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 24.80 0.60 1.00 -
USER-DEFINED - 52.80 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 77.60 SUBAREA RUNOFF(CFS) = 0.05
EFFECTIVE AREA(ACRES) = 204.20 AREA-AVERAGED Fm(INCH/HR) = 0.60

```

AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 204.20 PEAK FLOW RATE(CFS) = 13.77  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1011.00 TO NODE 1012.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2960.00 DOWNSTREAM(FEET) = 2940.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 900.00 CHANNEL SLOPE = 0.0222  
CHANNEL BASE(FEET) = 6.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 6.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 13.77  
FLOW VELOCITY(FEET/SEC.) = 3.05 FLOW DEPTH(FEET) = 0.68  
TRAVEL TIME(MIN.) = 4.92 Tc(MIN.) = 40.12  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1012.00 = 6020.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1011.00 TO NODE 1012.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 40.12  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.573  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 10.90 0.60 1.00 -  
USER-DEFINED - 15.10 0.60 1.00 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
SUBAREA AREA(ACRES) = 26.00 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 230.20 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 230.20 PEAK FLOW RATE(CFS) = 13.77  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1012.00 TO NODE 1013.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2940.00 DOWNSTREAM(FEET) = 2920.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 830.00 CHANNEL SLOPE = 0.0241  
CHANNEL BASE(FEET) = 6.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 6.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 13.77  
FLOW VELOCITY(FEET/SEC.) = 3.13 FLOW DEPTH(FEET) = 0.66  
TRAVEL TIME(MIN.) = 4.42 Tc(MIN.) = 44.54  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1013.00 = 6850.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1012.00 TO NODE 1013.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 44.54  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.548  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

USER-DEFINED - 3.20 0.60 1.00 -  
USER-DEFINED - 21.50 0.60 1.00 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
SUBAREA AREA(ACRES) = 24.70 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 254.90 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 254.90 PEAK FLOW RATE(CFS) = 13.77  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1013.00 TO NODE 1014.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2920.00 DOWNSTREAM(FEET) = 2905.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 564.00 CHANNEL SLOPE = 0.0266  
CHANNEL BASE(FEET) = 6.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 6.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 13.77  
FLOW VELOCITY(FEET/SEC.) = 3.22 FLOW DEPTH(FEET) = 0.64  
TRAVEL TIME(MIN.) = 2.92 Tc(MIN.) = 47.46  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1014.00 = 7414.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1013.00 TO NODE 1014.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 47.46  
\* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.531  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
USER-DEFINED - 79.00 0.60 1.00 -  
USER-DEFINED - 2.90 0.60 1.00 -  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
SUBAREA AREA(ACRES) = 81.90 SUBAREA RUNOFF(CFS) = 0.00  
EFFECTIVE AREA(ACRES) = 336.80 AREA-AVERAGED Fm(INCH/HR) = 0.60  
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
\* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
\* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
TOTAL AREA(ACRES) = 336.80 PEAK FLOW RATE(CFS) = 13.77  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1014.00 TO NODE 1015.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2905.00 DOWNSTREAM(FEET) = 2880.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 901.00 CHANNEL SLOPE = 0.0277  
CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 13.77  
FLOW VELOCITY(FEET/SEC.) = 3.15 FLOW DEPTH(FEET) = 0.58  
TRAVEL TIME(MIN.) = 4.77 Tc(MIN.) = 52.23  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1015.00 = 8315.00 FEET.

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*****
FLOW PROCESS FROM NODE 1014.00 TO NODE 1015.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 52.23
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.504
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED -      1.80   0.60   1.00 -
USER-DEFINED -     14.10   0.60   1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
SUBAREA AREA(ACRES) = 15.90   SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 352.70   AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60   AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 352.70   PEAK FLOW RATE(CFS) = 13.77
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

*****
FLOW PROCESS FROM NODE 1015.00 TO NODE 1035.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2880.00   DOWNSTREAM(FEET) = 2840.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1895.00   CHANNEL SLOPE = 0.0211
CHANNEL BASE(FEET) = 7.00   "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) = 7.00
CHANNEL FLOW THRU SUBAREA(CFS) = 13.77
FLOW VELOCITY(FEET/SEC.) = 2.87   FLOW DEPTH(FEET) = 0.63
TRAVEL TIME(MIN.) = 11.00   Tc(MIN.) = 63.23
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

*****
FLOW PROCESS FROM NODE 1015.00 TO NODE 1035.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 63.23
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.454
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED -      8.00   0.60   1.00 -
USER-DEFINED -     28.80   0.60   1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
SUBAREA AREA(ACRES) = 36.80   SUBAREA RUNOFF(CFS) = 0.00
EFFECTIVE AREA(ACRES) = 389.50   AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60   AREA-AVERAGED Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
TOTAL AREA(ACRES) = 389.50   PEAK FLOW RATE(CFS) = 13.77
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

*****
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 1
-----
>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<
-----

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TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 63.23
RAINFALL INTENSITY(INCH/HR) = 0.45
AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 389.50
TOTAL STREAM AREA(ACRES) = 389.50
PEAK FLOW RATE(CFS) AT CONFLUENCE = 13.77

*****
FLOW PROCESS FROM NODE 1020.00 TO NODE 1021.00 IS CODE = 21
-----
>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<
>>>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
-----
INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00
ELEVATION DATA: UPSTREAM(FEET) = 3525.00   DOWNSTREAM(FEET) = 3485.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.952
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.373
SUBAREA Tc AND LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS   Tc
LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" -      0.70   0.60   1.00   0   10.95
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" -      0.30   0.60   1.00   0   10.95
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA RUNOFF(CFS) = 0.70
TOTAL AREA(ACRES) = 1.00   PEAK FLOW RATE(CFS) = 0.70

*****
FLOW PROCESS FROM NODE 1021.00 TO NODE 1022.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3485.00   DOWNSTREAM(FEET) = 3440.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 191.00   CHANNEL SLOPE = 0.2356
CHANNEL BASE(FEET) = 1.00   "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) = 1.00
CHANNEL FLOW THRU SUBAREA(CFS) = 0.70
FLOW VELOCITY(FEET/SEC.) = 3.67   FLOW DEPTH(FEET) = 0.16
TRAVEL TIME(MIN.) = 0.87   Tc(MIN.) = 11.82
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1022.00 = 521.00 FEET.

*****
FLOW PROCESS FROM NODE 1021.00 TO NODE 1022.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 11.82
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.313
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED -      0.10   0.60   1.00 -
USER-DEFINED -      0.80   0.60   1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.90   SUBAREA RUNOFF(CFS) = 0.58
EFFECTIVE AREA(ACRES) = 1.90   AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60   AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 1.90   PEAK FLOW RATE(CFS) = 1.22

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*****
FLOW PROCESS FROM NODE 1022.00 TO NODE 1023.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3440.00 DOWNSTREAM(FEET) = 3400.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 227.00 CHANNEL SLOPE = 0.1762
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00
CHANNEL FLOW THRU SUBAREA(CFS) = 1.22
FLOW VELOCITY(FEET/SEC.) = 3.96 FLOW DEPTH(FEET) = 0.25
TRAVEL TIME(MIN.) = 0.96 Tc(MIN.) = 12.78
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1023.00 = 748.00 FEET.

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*****
FLOW PROCESS FROM NODE 1022.00 TO NODE 1023.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 12.78
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.246
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 1.20 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 1.20 SUBAREA RUNOFF(CFS) = 0.70
EFFECTIVE AREA(ACRES) = 3.10 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3.10 PEAK FLOW RATE(CFS) = 1.80

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*****
FLOW PROCESS FROM NODE 1023.00 TO NODE 1024.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3400.00 DOWNSTREAM(FEET) = 3280.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 160.00 CHANNEL SLOPE = 0.7500
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00
CHANNEL FLOW THRU SUBAREA(CFS) = 1.80
FLOW VELOCITY(FEET/SEC.) = 7.45 FLOW DEPTH(FEET) = 0.20
TRAVEL TIME(MIN.) = 0.36 Tc(MIN.) = 13.13
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1024.00 = 908.00 FEET.

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*****
FLOW PROCESS FROM NODE 1023.00 TO NODE 1024.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 13.13
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.221
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 0.10 0.60 1.00 -
USER-DEFINED - 0.60 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.70 SUBAREA RUNOFF(CFS) = 0.39
EFFECTIVE AREA(ACRES) = 3.80 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3.80 PEAK FLOW RATE(CFS) = 2.12

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*****
FLOW PROCESS FROM NODE 1024.00 TO NODE 1025.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3280.00 DOWNSTREAM(FEET) = 3240.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 138.00 CHANNEL SLOPE = 0.2899
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00
CHANNEL FLOW THRU SUBAREA(CFS) = 2.12
FLOW VELOCITY(FEET/SEC.) = 5.61 FLOW DEPTH(FEET) = 0.29
TRAVEL TIME(MIN.) = 0.41 Tc(MIN.) = 13.54
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1025.00 = 1046.00 FEET.

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*****
FLOW PROCESS FROM NODE 1024.00 TO NODE 1025.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 13.54
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.192
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 2.80 0.60 1.00 -
USER-DEFINED - 0.30 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 3.10 SUBAREA RUNOFF(CFS) = 1.65
EFFECTIVE AREA(ACRES) = 6.90 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 6.90 PEAK FLOW RATE(CFS) = 3.68

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*****
FLOW PROCESS FROM NODE 1025.00 TO NODE 1026.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3240.00 DOWNSTREAM(FEET) = 3200.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 200.00 CHANNEL SLOPE = 0.2000
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00
CHANNEL FLOW THRU SUBAREA(CFS) = 3.68
FLOW VELOCITY(FEET/SEC.) = 5.17 FLOW DEPTH(FEET) = 0.31
TRAVEL TIME(MIN.) = 0.64 Tc(MIN.) = 14.19
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1026.00 = 1246.00 FEET.

```

```

*****
FLOW PROCESS FROM NODE 1025.00 TO NODE 1026.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 14.19
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.147
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 1.50 0.60 1.00 -
USER-DEFINED - 1.80 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 3.30 SUBAREA RUNOFF(CFS) = 1.62
EFFECTIVE AREA(ACRES) = 10.20 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 10.20 PEAK FLOW RATE(CFS) = 5.02

```

```

*****
FLOW PROCESS FROM NODE 1026.00 TO NODE 1027.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3200.00 DOWNSTREAM(FEET) = 3120.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 477.00 CHANNEL SLOPE = 0.1677
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00
CHANNEL FLOW THRU SUBAREA(CFS) = 5.02
FLOW VELOCITY(FEET/SEC.) = 5.45 FLOW DEPTH(FEET) = 0.39
TRAVEL TIME(MIN.) = 1.46 Tc(MIN.) = 15.65
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1027.00 = 1723.00 FEET.

*****
FLOW PROCESS FROM NODE 1026.00 TO NODE 1027.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 15.65
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.058
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 3.90 0.60 1.00 -
USER-DEFINED - 3.10 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 7.00 SUBAREA RUNOFF(CFS) = 2.88
EFFECTIVE AREA(ACRES) = 17.20 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 17.20 PEAK FLOW RATE(CFS) = 7.09

*****
FLOW PROCESS FROM NODE 1027.00 TO NODE 1028.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3120.00 DOWNSTREAM(FEET) = 3100.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 273.00 CHANNEL SLOPE = 0.0733
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00
CHANNEL FLOW THRU SUBAREA(CFS) = 7.09
FLOW VELOCITY(FEET/SEC.) = 4.26 FLOW DEPTH(FEET) = 0.48
TRAVEL TIME(MIN.) = 1.07 Tc(MIN.) = 16.71
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1028.00 = 1996.00 FEET.

*****
FLOW PROCESS FROM NODE 1027.00 TO NODE 1028.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 16.71
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.004
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 2.70 0.60 1.00 -
USER-DEFINED - 0.50 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 3.20 SUBAREA RUNOFF(CFS) = 1.16
EFFECTIVE AREA(ACRES) = 20.40 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 20.40 PEAK FLOW RATE(CFS) = 7.43

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*****
FLOW PROCESS FROM NODE 1028.00 TO NODE 1029.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3100.00 DOWNSTREAM(FEET) = 3080.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 212.00 CHANNEL SLOPE = 0.0943
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00
CHANNEL FLOW THRU SUBAREA(CFS) = 7.43
FLOW VELOCITY(FEET/SEC.) = 4.72 FLOW DEPTH(FEET) = 0.45
TRAVEL TIME(MIN.) = 0.75 Tc(MIN.) = 17.46
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1029.00 = 2208.00 FEET.

*****
FLOW PROCESS FROM NODE 1028.00 TO NODE 1029.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 17.46
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.967
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 4.60 0.60 1.00 -
USER-DEFINED - 4.40 0.60 1.00 -
USER-DEFINED - 8.70 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 17.70 SUBAREA RUNOFF(CFS) = 5.85
EFFECTIVE AREA(ACRES) = 38.10 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 38.10 PEAK FLOW RATE(CFS) = 12.59

*****
FLOW PROCESS FROM NODE 1029.00 TO NODE 1030.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3080.00 DOWNSTREAM(FEET) = 3000.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 781.00 CHANNEL SLOPE = 0.1024
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00
CHANNEL FLOW THRU SUBAREA(CFS) = 12.59
FLOW VELOCITY(FEET/SEC.) = 5.74 FLOW DEPTH(FEET) = 0.61
TRAVEL TIME(MIN.) = 2.27 Tc(MIN.) = 19.73
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1030.00 = 2989.00 FEET.

*****
FLOW PROCESS FROM NODE 1029.00 TO NODE 1030.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 19.73
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.854
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 24.90 0.60 1.00 -
USER-DEFINED - 6.60 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 31.50 SUBAREA RUNOFF(CFS) = 7.19
EFFECTIVE AREA(ACRES) = 69.60 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 69.60 PEAK FLOW RATE(CFS) = 15.89

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*****
FLOW PROCESS FROM NODE 1030.00 TO NODE 1031.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3000.00 DOWNSTREAM(FEET) = 2980.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 392.00 CHANNEL SLOPE = 0.0510
CHANNEL BASE(FEET) = 4.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 4.00
CHANNEL FLOW THRU SUBAREA(CFS) = 15.89
FLOW VELOCITY(FEET/SEC.) = 4.61 FLOW DEPTH(FEET) = 0.73
TRAVEL TIME(MIN.) = 1.42 Tc(MIN.) = 21.15
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1031.00 = 3381.00 FEET.

*****
FLOW PROCESS FROM NODE 1030.00 TO NODE 1031.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 21.15
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.816
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 53.50 0.60 1.00 -
USER-DEFINED - 2.40 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 55.90 SUBAREA RUNOFF(CFS) = 10.87
EFFECTIVE AREA(ACRES) = 125.50 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 125.50 PEAK FLOW RATE(CFS) = 24.40

*****
FLOW PROCESS FROM NODE 1031.00 TO NODE 1032.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2980.00 DOWNSTREAM(FEET) = 2920.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1552.00 CHANNEL SLOPE = 0.0387
CHANNEL BASE(FEET) = 5.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 5.00
CHANNEL FLOW THRU SUBAREA(CFS) = 24.40
FLOW VELOCITY(FEET/SEC.) = 4.61 FLOW DEPTH(FEET) = 0.90
TRAVEL TIME(MIN.) = 5.61 Tc(MIN.) = 26.76
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1032.00 = 4933.00 FEET.

*****
FLOW PROCESS FROM NODE 1031.00 TO NODE 1032.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 26.76
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.698
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 65.60 0.60 1.00 -
USER-DEFINED - 44.00 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 109.60 SUBAREA RUNOFF(CFS) = 9.69
EFFECTIVE AREA(ACRES) = 235.10 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 235.10 PEAK FLOW RATE(CFS) = 24.40

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NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
*****
FLOW PROCESS FROM NODE 1032.00 TO NODE 1033.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2920.00 DOWNSTREAM(FEET) = 2900.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 976.00 CHANNEL SLOPE = 0.0205
CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00
CHANNEL FLOW THRU SUBAREA(CFS) = 24.40
FLOW VELOCITY(FEET/SEC.) = 3.48 FLOW DEPTH(FEET) = 0.89
TRAVEL TIME(MIN.) = 4.68 Tc(MIN.) = 31.44
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1033.00 = 5909.00 FEET.

*****
FLOW PROCESS FROM NODE 1032.00 TO NODE 1033.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 31.44
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.622
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 35.60 0.60 1.00 -
USER-DEFINED - 0.60 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 36.20 SUBAREA RUNOFF(CFS) = 0.72
EFFECTIVE AREA(ACRES) = 271.30 AREA-AVERAGED Fm(INCH/HR) = 0.60
AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 271.30 PEAK FLOW RATE(CFS) = 24.40
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

*****
FLOW PROCESS FROM NODE 1033.00 TO NODE 1034.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2900.00 DOWNSTREAM(FEET) = 2880.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 942.00 CHANNEL SLOPE = 0.0212
CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00
CHANNEL FLOW THRU SUBAREA(CFS) = 24.40
FLOW VELOCITY(FEET/SEC.) = 3.52 FLOW DEPTH(FEET) = 0.88
TRAVEL TIME(MIN.) = 4.46 Tc(MIN.) = 35.90
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1034.00 = 6851.00 FEET.

*****
FLOW PROCESS FROM NODE 1033.00 TO NODE 1034.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 35.90
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 0.597
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
USER-DEFINED - 30.50 0.60 1.00 -
USER-DEFINED - 1.20 0.60 1.00 -
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.60
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.

```



SUBAREA AREA(ACRES) = 31.70 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 303.00 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 303.00 PEAK FLOW RATE(CFS) = 24.40  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1034.00 TO NODE 1035.00 IS CODE = 51  
 -----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<<  
 >>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<<  
 -----  
 ELEVATION DATA: UPSTREAM(FEET) = 2880.00 DOWNSTREAM(FEET) = 2840.00  
 CHANNEL LENGTH THRU SUBAREA( FEET) = 1097.00 CHANNEL SLOPE = 0.0365  
 CHANNEL BASE( FEET) = 7.00 "Z" FACTOR = 1.000  
 MANNING'S FACTOR = 0.050 MAXIMUM DEPTH( FEET) = 7.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 24.40  
 FLOW VELOCITY( FEET/SEC.) = 4.20 FLOW DEPTH( FEET) = 0.75  
 TRAVEL TIME( MIN.) = 4.36 Tc( MIN.) = 40.26  
 LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1035.00 = 7948.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1034.00 TO NODE 1035.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<  
 -----

MAINLINE Tc( MIN) = 40.26  
 \* 2 YEAR RAINFALL INTENSITY( INCH/HR) = 0.572  
 SUBAREA LOSS RATE DATA( AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
USER-DEFINED	-	1.20	0.60	1.00	-
USER-DEFINED	-	113.90	0.60	1.00	-
USER-DEFINED	-	18.60	0.60	1.00	-

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.60  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 SUBAREA AREA(ACRES) = 133.70 SUBAREA RUNOFF(CFS) = 0.00  
 EFFECTIVE AREA(ACRES) = 436.70 AREA-AVERAGED Fm(INCH/HR) = 0.60  
 AREA-AVERAGED Fp(INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 \* RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;  
 \* IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.  
 TOTAL AREA(ACRES) = 436.70 PEAK FLOW RATE(CFS) = 24.40  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 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.) = 40.26  
 RAINFALL INTENSITY( INCH/HR) = 0.57  
 AREA-AVERAGED Fm( INCH/HR) = 0.60  
 AREA-AVERAGED Fp( INCH/HR) = 0.60  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA( ACRES) = 436.70  
 TOTAL STREAM AREA( ACRES) = 436.70  
 PEAK FLOW RATE( CFS) AT CONFLUENCE = 24.40

\*\* CONFLUENCE DATA \*\*  

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
------------------	------------	--------------	------------------------	---------------------	-----------------	---------------	-------------------

1	13.77	63.23	0.454	0.60( 0.60)	1.00	389.5	1000.00
2	24.40	40.26	0.572	0.60( 0.60)	1.00	436.7	1020.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	35.44	40.26	0.572	0.60( 0.60)	1.00	684.7	1020.00
2	33.15	63.23	0.454	0.60( 0.60)	1.00	826.2	1000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 35.44 Tc( MIN.) = 40.26  
 EFFECTIVE AREA(ACRES) = 684.70 AREA-AVERAGED Fm( INCH/HR) = 0.60  
 AREA-AVERAGED Fp( INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 826.20  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

=====  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 826.20 TC( MIN.) = 40.26  
 EFFECTIVE AREA(ACRES) = 684.70 AREA-AVERAGED Fm( INCH/HR) = 0.60  
 AREA-AVERAGED Fp( INCH/HR) = 0.60 AREA-AVERAGED Ap = 1.00  
 PEAK FLOW RATE(CFS) = 35.44

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (DECIMAL)	Ae (ACRES)	HEADWATER NODE
1	35.44	40.26	0.572	0.60( 0.60)	1.00	684.7	1020.00
2	33.15	63.23	0.454	0.60( 0.60)	1.00	826.2	1000.00

=====  
 END OF RATIONAL METHOD ANALYSIS  
 =====

\*\*\*\*\*

FLOOD ROUTING ANALYSIS  
USING COUNTY HYDROLOGY MANUAL OF ORANGE (1986)  
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-----  
FILE NAME: LU35002E.FLD  
TIME/DATE OF STUDY: 13:11 02/25/2004

\*\*\*\*\*

FLOW PROCESS FROM NODE 1000.00 TO NODE 1035.00 IS CODE = 1

-----  
>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<  
=====

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 826.200 ACRES  
BASEFLOW = 0.000 CFS/SQUARE-MILE  
\*USER ENTERED "LAG" TIME = 0.840 HOURS  
VALLEY (DEVELOPED):  
"S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.000  
FOOTHILL "S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.030  
MOUNTAIN "S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.920  
VALLEY (UNDEVELOPED)/DESERT:  
"S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.050  
DESERT (UNDEVELOPED) "S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.000  
MAXIMUM WATERSHED LOSS RATE (INCH/HOUR) = 0.600  
LOW LOSS FRACTION = 0.740  
\*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL (INCH) = 0.18  
SPECIFIED PEAK 30-MINUTES RAINFALL (INCH) = 0.32  
SPECIFIED PEAK 1-HOUR RAINFALL (INCH) = 0.46  
SPECIFIED PEAK 3-HOUR RAINFALL (INCH) = 0.94  
SPECIFIED PEAK 6-HOUR RAINFALL (INCH) = 1.46  
SPECIFIED PEAK 24-HOUR RAINFALL (INCH) = 2.67

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
5-MINUTE FACTOR = 0.963  
30-MINUTE FACTOR = 0.963  
1-HOUR FACTOR = 0.963  
3-HOUR FACTOR = 0.994  
6-HOUR FACTOR = 0.997  
24-HOUR FACTOR = 0.998

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 9.921

RUNOFF HYDROGRAPH LISTING LIMITS:  
MODEL TIME (HOURS) FOR BEGINNING OF RESULTS = 14.00  
MODEL TIME (HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES (CFS)
1	1.075	107.370
2	3.342	226.564
3	6.452	310.788
4	10.509	405.295
5	16.062	554.891
6	23.361	729.267
7	31.456	808.820
8	37.773	631.275
9	42.919	514.169
10	47.476	455.318
11	51.460	398.094
12	54.436	297.283
13	56.987	254.937
14	59.129	213.965
15	61.202	207.192
16	63.137	193.363
17	64.820	168.142
18	66.379	155.747
19	67.866	148.622
20	69.238	137.068
21	70.505	126.588
22	71.753	124.657
23	72.947	119.320
24	73.971	102.311
25	74.949	97.742
26	75.863	91.355
27	76.761	89.669
28	77.601	84.015
29	78.426	82.396
30	79.194	76.730
31	79.901	70.659
32	80.602	70.000
33	81.272	66.941
34	81.926	65.331
35	82.578	65.149
36	83.153	57.470
37	83.679	52.564
38	84.205	52.563
39	84.724	51.874
40	85.176	45.120
41	85.609	43.335
42	86.041	43.150
43	86.467	42.554
44	86.875	40.774
45	87.253	37.707
46	87.627	37.415
47	88.001	37.372
48	88.375	37.373
49	88.739	36.376
50	89.077	33.792
51	89.414	33.608
52	89.749	33.469
53	90.080	33.128
54	90.412	33.111
55	90.726	31.412
56	91.020	29.386
57	91.314	29.349
58	91.608	29.420
59	91.902	29.384
60	92.196	29.386
61	92.485	28.877

62	92.738	25.282
63	92.980	24.140
64	93.221	24.035
65	93.461	24.036
66	93.702	24.072
67	93.942	24.001
68	94.183	24.068
69	94.412	22.841
70	94.601	18.896
71	94.787	18.569
72	94.972	18.568
73	95.158	18.572
74	95.344	18.569
75	95.530	18.533
76	95.716	18.607
77	95.902	18.569
78	96.087	18.534
79	96.268	18.027
80	96.411	14.299
81	96.547	13.645
82	96.682	13.459
83	96.817	13.495
84	96.952	13.459
85	97.087	13.495
86	97.222	13.495
87	97.357	13.459
88	97.492	13.531
89	97.626	13.386
90	97.761	13.531
91	97.893	13.161
92	98.024	13.103
93	98.145	12.089
94	98.194	4.922
95	98.231	3.619
96	98.267	3.619
97	98.302	3.475
98	98.338	3.619
99	98.374	3.619
100	98.410	3.547
101	98.446	3.619
102	98.481	3.547
103	98.518	3.619
104	98.553	3.548
105	98.589	3.546
106	98.626	3.693
107	98.661	3.546
108	98.697	3.548
109	98.733	3.619
110	98.768	3.547
111	98.804	3.619
112	98.839	3.475
113	98.876	3.693
114	98.911	3.474
115	98.947	3.619
116	98.983	3.620
117	99.019	3.547
118	99.055	3.619
119	99.091	3.619
120	99.128	3.619
121	99.164	3.619
122	99.200	3.620
123	99.236	3.619
124	99.273	3.619
125	99.309	3.619
126	99.345	3.619
127	99.381	3.619
128	99.417	3.619

129	99.454	3.619
130	99.490	3.620
131	99.526	3.619
132	99.562	3.619
133	99.599	3.619
134	99.635	3.619
135	99.671	3.619
136	99.707	3.619
137	99.743	3.619
138	99.780	3.619
139	99.816	3.620
140	99.852	3.619
141	99.888	3.619
142	99.925	3.619
143	99.961	3.619
144	99.997	3.619
145	100.000	0.298

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TOTAL SOIL-LOSS VOLUME (ACRE-FEET) = 130.4180  
TOTAL STORM RUNOFF VOLUME (ACRE-FEET) = 53.0790  
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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

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

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TIME (HRS)	VOLUME (AF)	Q (CFS)	0.	50.0	100.0	150.0	200.0
14.000	16.2818	33.21	.	Q	.	V	.
14.083	16.5139	33.70	.	Q	.	V	.
14.167	16.7498	34.24	.	Q	.	V	.
14.250	16.9895	34.81	.	Q	.	V	.
14.333	17.2335	35.42	.	Q	.	V	.
14.417	17.4821	36.09	.	Q	.	V	.
14.500	17.7356	36.82	.	Q	.	V	.
14.583	17.9945	37.58	.	Q	.	V	.
14.667	18.2584	38.32	.	Q	.	V	.
14.750	18.5273	39.05	.	Q	.	V	.
14.833	18.8012	39.78	.	Q	.	V	.
14.917	19.0804	40.53	.	Q	.	V	.
15.000	19.3647	41.28	.	Q	.	V	.
15.083	19.6543	42.06	.	Q	.	V	.
15.167	19.9495	42.86	.	Q	.	V	.
15.250	20.2507	43.73	.	Q	.	V	.
15.333	20.5581	44.63	.	Q	.	V	.
15.417	20.8711	45.45	.	Q	.	V	.
15.500	21.1891	46.17	.	Q	.	V	.
15.583	21.5121	46.90	.	Q	.	V	.
15.667	21.8400	47.62	.	Q	.	V	.
15.750	22.1710	48.05	.	Q	.	V	.
15.833	22.5026	48.16	.	Q	.	V	.
15.917	22.8363	48.45	.	Q	.	V	.
16.000	23.1779	49.60	.	Q	.	V	.
16.083	23.6142	63.36	.	Q	.	V	.
16.167	24.1523	78.13	.	Q	.	V	.
16.250	24.7654	89.02	.	Q	.	V	.
16.333	25.4671	101.89	.	Q	.	V	.
16.417	26.3024	121.29	.	Q	.	V	.
16.500	27.2838	142.50	.	Q	.	V	.
16.583	28.3252	151.22	.	Q	.	V	.
16.667	29.2215	130.14	.	Q	.	V	.
16.750	30.0221	116.24	.	Q	.	V	.
16.833	30.7715	108.82	.	Q	.	V	.
16.917	31.4697	101.38	.	Q	.	V	.
17.000	32.0815	88.83	.	Q	.	V	.
17.083	32.6534	83.04	.	Q	.	V	.
17.167	33.1866	77.42	.	Q	.	V	.
17.250	33.7082	75.73	.	Q	.	V	.
17.333	34.2116	73.11	.	Q	.	V	.
17.417	34.6883	69.22	.	Q	.	V	.
17.500	35.1483	66.78	.	Q	.	V	.
17.583	35.5956	64.95	.	Q	.	V	.
17.667	36.0275	62.72	.	Q	.	V	.
17.750	36.4455	60.69	.	Q	.	V	.
17.833	36.8564	59.66	.	Q	.	V	.
17.917	37.2574	58.23	.	Q	.	V	.
18.000	37.6399	55.54	.	Q	.	V	.
18.083	38.0133	54.22	.	Q	.	V	.
18.167	38.3756	52.60	.	Q	.	V	.
18.250	38.7301	51.47	.	Q	.	V	.
18.333	39.0731	49.80	.	Q	.	V	.
18.417	39.4067	48.45	.	Q	.	V	.
18.500	39.7266	46.45	.	Q	.	V	.
18.583	40.0321	44.36	.	Q	.	V	.

18.667	40.3291	43.11	.	Q	.	V	.
18.750	40.6166	41.74	.	Q	.	V	.
18.833	40.8962	40.60	.	Q	.	V	.
18.917	41.1693	39.66	.	Q	.	V	.
19.000	41.4310	38.00	.	Q	.	V	.
19.083	41.6842	36.75	.	Q	.	V	.
19.167	41.9329	36.11	.	Q	.	V	.
19.250	42.1766	35.39	.	Q	.	V	.
19.333	42.4108	34.01	.	Q	.	V	.
19.417	42.6399	33.26	.	Q	.	V	.
19.500	42.8653	32.72	.	Q	.	V	.
19.583	43.0867	32.15	.	Q	.	V	.
19.667	43.3033	31.45	.	Q	.	V	.
19.750	43.5142	30.64	.	Q	.	V	.
19.833	43.7219	30.16	.	Q	.	V	.
19.917	43.9266	29.72	.	Q	.	V	.
20.000	44.1285	29.31	.	Q	.	V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE (1986)  
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Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LU36002E.FLD  
 TIME/DATE OF STUDY: 13:11 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1036.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 879.400 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 0.900 HOURS  
 VALLEY (DEVELOPED):  
 "S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.030  
 MOUNTAIN "S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.910  
 VALLEY (UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.050  
 DESERT (UNDEVELOPED) "S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE (INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.750  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL (INCH) = 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL (INCH) = 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL (INCH) = 0.46  
 SPECIFIED PEAK 3-HOUR RAINFALL (INCH) = 0.94  
 SPECIFIED PEAK 6-HOUR RAINFALL (INCH) = 1.46  
 SPECIFIED PEAK 24-HOUR RAINFALL (INCH) = 2.67

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.961  
 30-MINUTE FACTOR = 0.961  
 1-HOUR FACTOR = 0.961  
 3-HOUR FACTOR = 0.994  
 6-HOUR FACTOR = 0.997  
 24-HOUR FACTOR = 0.998

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 9.259

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME (HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME (HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES (CFS)
1	0.998	106.153
2	3.055	218.755
3	5.877	300.112
4	9.357	370.072
5	14.141	508.825
6	20.437	669.612
7	28.023	806.760
8	34.659	705.766
9	39.999	567.890
10	44.606	489.969
11	48.750	440.732
12	52.268	374.208
13	54.960	286.238
14	57.334	252.487
15	59.364	215.942
16	61.324	208.469
17	63.176	196.913
18	64.780	170.640
19	66.258	157.116
20	67.684	151.695
21	69.008	140.838
22	70.214	128.264
23	71.385	124.471
24	72.542	123.127
25	73.582	110.536
26	74.516	99.378
27	75.405	94.501
28	76.247	89.590
29	77.074	87.908
30	77.849	82.418
31	78.612	81.220
32	79.331	76.392
33	79.987	69.811
34	80.637	69.163
35	81.269	67.146
36	81.875	64.471
37	82.480	64.411
38	83.061	61.724
39	83.555	52.552
40	84.041	51.686
41	84.527	51.667
42	84.996	49.930
43	85.403	43.268
44	85.804	42.626
45	86.203	42.398
46	86.596	41.838
47	86.976	40.375
48	87.325	37.212
49	87.671	36.784
50	88.017	36.734
51	88.362	36.757
52	88.707	36.630
53	89.026	33.999
54	89.337	33.061
55	89.648	33.014
56	89.956	32.797
57	90.262	32.548
58	90.568	32.505
59	90.853	30.343
60	91.125	28.912
61	91.397	28.914

62	91.668	28.832
63	91.940	28.913
64	92.212	28.912
65	92.483	28.837
66	92.727	25.971
67	92.951	23.863
68	93.174	23.702
69	93.396	23.569
70	93.618	23.656
71	93.841	23.656
72	94.062	23.571
73	94.285	23.694
74	94.492	21.982
75	94.664	18.347
76	94.836	18.304
77	95.008	18.224
78	95.179	18.224
79	95.351	18.307
80	95.523	18.223
81	95.694	18.225
82	95.866	18.264
83	96.037	18.264
84	96.209	18.223
85	96.363	16.427
86	96.490	13.445
87	96.615	13.338
88	96.740	13.296
89	96.864	13.214
90	96.989	13.296
91	97.113	13.172
92	97.239	13.335
93	97.362	13.173
94	97.487	13.253
95	97.612	13.254
96	97.736	13.254
97	97.860	13.124
98	97.981	12.902
99	98.102	12.902
100	98.191	9.390
101	98.225	3.675
102	98.258	3.512
103	98.291	3.511
104	98.324	3.512
105	98.357	3.511
106	98.390	3.512
107	98.424	3.593
108	98.456	3.430
109	98.490	3.593
110	98.522	3.430
111	98.556	3.593
112	98.589	3.511
113	98.622	3.512
114	98.655	3.511
115	98.688	3.512
116	98.721	3.511
117	98.755	3.593
118	98.787	3.430
119	98.821	3.593
120	98.853	3.430
121	98.887	3.593
122	98.919	3.430
123	98.953	3.593
124	98.986	3.511
125	99.019	3.512
126	99.052	3.511
127	99.085	3.512
128	99.118	3.511

129	99.151	3.511
130	99.184	3.511
131	99.217	3.511
132	99.250	3.511
133	99.283	3.511
134	99.316	3.511
135	99.349	3.511
136	99.382	3.511
137	99.415	3.511
138	99.448	3.511
139	99.481	3.511
140	99.514	3.511
141	99.547	3.512
142	99.580	3.511
143	99.613	3.511
144	99.646	3.511
145	99.679	3.511
146	99.712	3.511
147	99.745	3.511
148	99.778	3.511
149	99.811	3.511
150	99.844	3.511
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TOTAL SOIL-LOSS VOLUME (ACRE-FEET) =		140.6499
TOTAL STORM RUNOFF VOLUME (ACRE-FEET) =		54.5577
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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

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

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TIME (HRS)	VOLUME (AF)	Q (CFS)	0.	50.0	100.0	150.0	200.0
14.000	16.4426	33.54	.	Q	.	V	.
14.083	16.6770	34.04	.	Q	.	V	.
14.167	16.9152	34.58	.	Q	.	V	.
14.250	17.1573	35.15	.	Q	.	V	.
14.333	17.4035	35.75	.	Q	.	V	.
14.417	17.6543	36.41	.	Q	.	V	.
14.500	17.9100	37.12	.	Q	.	V	.
14.583	18.1709	37.89	.	Q	.	V	.
14.667	18.4371	38.65	.	Q	.	V	.
14.750	18.7083	39.39	.	Q	.	V	.
14.833	18.9847	40.13	.	Q	.	V	.
14.917	19.2663	40.88	.	Q	.	V	.
15.000	19.5531	41.65	.	Q	.	V	.
15.083	19.8454	42.44	.	Q	.	V	.
15.167	20.1433	43.25	.	Q	.	V	.
15.250	20.4471	44.11	.	Q	.	V	.
15.333	20.7571	45.01	.	Q	.	V	.
15.417	21.0727	45.83	.	Q	.	V	.
15.500	21.3934	46.56	.	Q	.	V	.
15.583	21.7191	47.29	.	Q	.	V	.
15.667	22.0500	48.05	.	Q	.	V	.
15.750	22.3843	48.54	.	Q	.	V	.
15.833	22.7201	48.76	.	Q	.	V	.
15.917	23.0579	49.05	.	Q	.	V	.
16.000	23.4030	50.10	.	Q	.	V	.
16.083	23.8413	63.64	.	Q	.	V	.
16.167	24.3760	77.65	.	Q	.	V	.
16.250	24.9819	87.98	.	Q	.	V	.
16.333	25.6543	97.62	.	Q	.	V	.
16.417	26.4510	115.69	.	Q	.	V	.
16.500	27.3858	135.73	.	Q	.	V	.
16.583	28.4300	151.62	.	Q	.	V	.
16.667	29.3900	139.40	.	Q	.	V	.
16.750	30.2379	123.11	.	Q	.	V	.
16.833	31.0208	113.68	.	Q	.	V	.
16.917	31.7605	107.39	.	Q	.	V	.
17.000	32.4410	98.82	.	Q	.	V	.
17.083	33.0453	87.74	.	Q	.	V	.
17.167	33.6165	82.94	.	Q	.	V	.
17.250	34.1527	77.86	.	Q	.	V	.
17.333	34.6767	76.09	.	Q	.	V	.
17.417	35.1844	73.71	.	Q	.	V	.
17.500	35.6644	69.70	.	Q	.	V	.
17.583	36.1269	67.15	.	Q	.	V	.
17.667	36.5784	65.56	.	Q	.	V	.
17.750	37.0153	63.43	.	Q	.	V	.
17.833	37.4367	61.19	.	Q	.	V	.
17.917	37.8499	59.99	.	Q	.	V	.
18.000	38.2567	59.07	.	Q	.	V	.
18.083	38.6478	56.79	.	Q	.	V	.
18.167	39.0239	54.61	.	Q	.	V	.
18.250	39.3897	53.11	.	Q	.	V	.
18.333	39.7448	51.56	.	Q	.	V	.
18.417	40.0910	50.27	.	Q	.	V	.
18.500	40.4243	48.39	.	Q	.	V	.
18.583	40.7471	46.88	.	Q	.	V	.

18.667	41.0575	45.07	.	Q	.	V	.
18.750	41.3552	43.23	.	Q	.	V	.
18.833	41.6456	42.17	.	Q	.	V	.
18.917	41.9282	41.04	.	Q	.	V	.
19.000	42.2031	39.92	.	Q	.	V	.
19.083	42.4728	39.16	.	Q	.	V	.
19.167	42.7355	38.14	.	Q	.	V	.
19.250	42.9866	36.46	.	Q	.	V	.
19.333	43.2329	35.77	.	Q	.	V	.
19.417	43.4751	35.17	.	Q	.	V	.
19.500	43.7121	34.41	.	Q	.	V	.
19.583	43.9401	33.11	.	Q	.	V	.
19.667	44.1643	32.55	.	Q	.	V	.
19.750	44.3850	32.05	.	Q	.	V	.
19.833	44.6022	31.53	.	Q	.	V	.
19.917	44.8151	30.91	.	Q	.	V	.
20.000	45.0225	30.12	.	Q	.	V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
USING COUNTY HYDROLOGY MANUAL OF ORANGE (1986)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LU37002E.FLD  
TIME/DATE OF STUDY: 13:12 02/25/2004

\*\*\*\*\*

FLOW PROCESS FROM NODE 1000.00 TO NODE 1037.00 IS CODE = 1

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>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<  
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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 976.200 ACRES  
BASEFLOW = 0.000 CFS/SQUARE-MILE  
\*USER ENTERED "LAG" TIME = 0.970 HOURS  
VALLEY (DEVELOPED):  
"S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.010  
FOOTHILL "S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.040  
MOUNTAIN "S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.890  
VALLEY (UNDEVELOPED)/DESERT:  
"S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.060  
DESERT (UNDEVELOPED) "S"-CURVE PERCENTAGE (DECIMAL NOTATION) = 0.000  
MAXIMUM WATERSHED LOSS RATE (INCH/HOUR) = 0.600  
LOW LOSS FRACTION = 0.750  
\*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL (INCH) = 0.18  
SPECIFIED PEAK 30-MINUTES RAINFALL (INCH) = 0.32  
SPECIFIED PEAK 1-HOUR RAINFALL (INCH) = 0.46  
SPECIFIED PEAK 3-HOUR RAINFALL (INCH) = 0.94  
SPECIFIED PEAK 6-HOUR RAINFALL (INCH) = 1.46  
SPECIFIED PEAK 24-HOUR RAINFALL (INCH) = 2.67

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
5-MINUTE FACTOR = 0.956  
30-MINUTE FACTOR = 0.956  
1-HOUR FACTOR = 0.956  
3-HOUR FACTOR = 0.993  
6-HOUR FACTOR = 0.997  
24-HOUR FACTOR = 0.998

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 8.591

RUNOFF HYDROGRAPH LISTING LIMITS:  
MODEL TIME (HOURS) FOR BEGINNING OF RESULTS = 14.00  
MODEL TIME (HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES (CFS)
1	0.920	108.586
2	2.777	219.284
3	5.295	297.289
4	8.313	356.226
5	12.326	473.772
6	17.665	630.327
7	24.097	759.445
8	31.104	827.227
9	36.650	654.758
10	41.257	543.822
11	45.499	500.807
12	49.404	461.003
13	52.614	379.072
14	55.107	294.227
15	57.359	265.922
16	59.266	225.149
17	61.116	218.440
18	62.894	209.895
19	64.434	181.746
20	65.869	169.418
21	67.216	159.004
22	68.494	150.869
23	69.686	140.761
24	70.792	130.539
25	71.875	127.913
26	72.946	126.414
27	73.889	111.320
28	74.758	102.607
29	75.585	97.663
30	76.368	92.481
31	77.142	91.346
32	77.870	85.887
33	78.580	83.819
34	79.274	81.951
35	79.896	73.493
36	80.501	71.448
37	81.101	70.796
38	81.673	67.492
39	82.233	66.137
40	82.793	66.130
41	83.322	62.479
42	83.775	53.483
43	84.224	52.918
44	84.672	52.941
45	85.114	52.177
46	85.499	45.401
47	85.868	43.670
48	86.238	43.628
49	86.601	42.884
50	86.961	42.498
51	87.295	39.465
52	87.615	37.698
53	87.932	37.438
54	88.248	37.376
55	88.565	37.401
56	88.881	37.330
57	89.175	34.705
58	89.461	33.670
59	89.746	33.654
60	90.030	33.518
61	90.309	33.020



62	90.589	33.068
63	90.863	32.350
64	91.115	29.676
65	91.364	29.386
66	91.613	29.386
67	91.862	29.391
68	92.110	29.383
69	92.359	29.390
70	92.608	29.296
71	92.833	26.662
72	93.039	24.328
73	93.243	24.008
74	93.445	23.919
75	93.648	23.911
76	93.851	24.011
77	94.053	23.864
78	94.257	24.008
79	94.459	23.870
80	94.636	20.854
81	94.792	18.513
82	94.949	18.516
83	95.106	18.516
84	95.263	18.516
85	95.420	18.558
86	95.577	18.471
87	95.734	18.561
88	95.891	18.516
89	96.047	18.513
90	96.204	18.513
91	96.359	18.275
92	96.484	14.738
93	96.599	13.641
94	96.713	13.465
95	96.827	13.429
96	96.941	13.477
97	97.054	13.334
98	97.168	13.477
99	97.282	13.383
100	97.396	13.430
101	97.509	13.382
102	97.624	13.525
103	97.736	13.334
104	97.850	13.430
105	97.961	13.051
106	98.072	13.090
107	98.179	12.708
108	98.239	7.071
109	98.269	3.535
110	98.300	3.631
111	98.329	3.440
112	98.360	3.632
113	98.390	3.535
114	98.420	3.534
115	98.450	3.535
116	98.480	3.535
117	98.509	3.536
118	98.540	3.631
119	98.570	3.535
120	98.600	3.535
121	98.629	3.440
122	98.660	3.631
123	98.690	3.535
124	98.720	3.535
125	98.750	3.535
126	98.780	3.535
127	98.810	3.535
128	98.840	3.536

129	98.870	3.630
130	98.900	3.440
131	98.930	3.631
132	98.959	3.440
133	98.990	3.632
134	99.019	3.440
135	99.050	3.631
136	99.080	3.535
137	99.110	3.535
138	99.140	3.534
139	99.170	3.535
140	99.200	3.535
141	99.230	3.535
142	99.260	3.535
143	99.290	3.535
144	99.320	3.535
145	99.350	3.535
146	99.380	3.535
147	99.409	3.535
148	99.439	3.534
149	99.469	3.535
150	99.499	3.535
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TOTAL SOIL-LOSS VOLUME (ACRE-FEET) =		156.1478
TOTAL STORM RUNOFF VOLUME (ACRE-FEET) =		60.2960
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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

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

TIME (HRS)	VOLUME (AF)	Q (CFS)	0.	50.0	100.0	150.0	200.0
14.000	17.9744	36.64	.	Q .V	.	.	.
14.083	18.2305	37.19	.	Q . V	.	.	.
14.167	18.4908	37.79	.	Q . V	.	.	.
14.250	18.7553	38.41	.	Q . V	.	.	.
14.333	19.0244	39.06	.	Q . V	.	.	.
14.417	19.2982	39.76	.	Q . V	.	.	.
14.500	19.5773	40.52	.	Q . V	.	.	.
14.583	19.8619	41.33	.	Q . V	.	.	.
14.667	20.1525	42.19	.	Q . V	.	.	.
14.750	20.4487	43.01	.	Q . V	.	.	.
14.833	20.7505	43.83	.	Q . V	.	.	.
14.917	21.0581	44.66	.	Q . V	.	.	.
15.000	21.3715	45.51	.	Q . V	.	.	.
15.083	21.6908	46.37	.	Q . V	.	.	.
15.167	22.0163	47.25	.	Q . V	.	.	.
15.250	22.3481	48.18	.	Q . V	.	.	.
15.333	22.6866	49.15	.	Q . V	.	.	.
15.417	23.0312	50.04	.	Q . V	.	.	.
15.500	23.3813	50.83	.	Q . V	.	.	.
15.583	23.7368	51.62	.	Q . V	.	.	.
15.667	24.0982	52.47	.	Q . V	.	.	.
15.750	24.4636	53.07	.	Q . V	.	.	.
15.833	24.8314	53.40	.	Q . V	.	.	.
15.917	25.2020	53.82	.	Q . V	.	.	.
16.000	25.5794	54.79	.	Q . V	.	.	.
16.083	26.0513	68.53	.	Q . V	.	.	.
16.167	26.6181	82.30	.	Q V	.	.	.
16.250	27.2533	92.22	.	Q .	.	.	.
16.333	27.9432	100.18	.	V Q	.	.	.
16.417	28.7389	115.54	.	V . Q	.	.	.
16.500	29.6710	135.35	.	V .	Q	.	.
16.583	30.7114	151.06	.	V	Q	Q	.
16.667	31.8021	158.37	.	V	Q	Q	.
16.750	32.7529	138.06	.	V	Q	Q	.
16.833	33.6147	125.13	.	V	Q	Q	.
16.917	34.4394	119.74	.	V Q	Q	Q	.
17.000	35.2278	114.47	.	V Q	Q	Q	.
17.083	35.9444	104.06	.	Q V	Q	Q	.
17.167	36.5871	93.32	.	Q Q	Q	Q	.
17.250	37.2006	89.07	.	Q Q	Q	Q	.
17.333	37.7756	83.50	.	Q Q	Q	Q	.
17.417	38.3389	81.78	.	Q Q	Q	Q	.
17.500	38.8875	79.66	.	Q Q	Q	Q	.
17.583	39.4065	75.36	.	Q Q	Q	Q	.
17.667	39.9086	72.91	.	Q Q	Q	Q	.
17.750	40.3958	70.74	.	Q Q	Q	Q	.
17.833	40.8703	68.90	.	Q Q	Q	Q	.
17.917	41.3308	66.86	.	Q Q	Q	Q	.
18.000	41.7778	64.90	.	Q Q	Q	Q	.
18.083	42.2167	63.72	.	Q Q	Q	Q	.
18.167	42.6474	62.55	.	Q Q	Q	Q	.
18.250	43.0592	59.79	.	Q Q	Q	Q	.
18.333	43.4570	57.76	.	Q Q	Q	Q	.
18.417	43.8430	56.06	.	Q Q	Q	Q	.
18.500	44.2164	54.21	.	Q Q	Q	Q	.
18.583	44.5793	52.71	.	Q Q	Q	Q	.

18.667	44.9282	50.66	.	Q	.	V.	.
18.750	45.2670	49.19	.	Q.	.	V	.
18.833	45.5966	47.86	.	Q.	.	V	.
18.917	45.9124	45.86	.	Q.	.	V	.
19.000	46.2199	44.65	.	Q .	.	V	.
19.083	46.5209	43.70	.	Q .	.	V	.
19.167	46.8141	42.58	.	Q .	.	V	.
19.250	47.1014	41.72	.	Q .	.	V	.
19.333	47.3840	41.03	.	Q .	.	V	.
19.417	47.6590	39.93	.	Q .	.	V	.
19.500	47.9226	38.28	.	Q .	.	V	.
19.583	48.1819	37.65	.	Q .	.	V	.
19.667	48.4374	37.10	.	Q .	.	V	.
19.750	48.6885	36.45	.	Q .	.	V	.
19.833	48.9305	35.15	.	Q .	.	V	.
19.917	49.1679	34.46	.	Q .	.	V	.
20.000	49.4019	33.99	.	Q .	.	V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LU38002E.FLD  
 TIME/DATE OF STUDY: 13:12 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1038.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 1141.900 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.030 HOURS  
 VALLEY(DEVELOPED):  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.040  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.890  
 VALLEY(UNDEVELOPED)/DESERT:  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.750  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.94  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.46  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.67

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.949  
 30-MINUTE FACTOR = 0.949  
 1-HOUR FACTOR = 0.949  
 3-HOUR FACTOR = 0.992  
 6-HOUR FACTOR = 0.996  
 24-HOUR FACTOR = 0.998

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 8.091

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.866	119.619
2	2.596	238.823
3	4.889	316.776
4	7.618	376.776
5	11.176	491.443
6	15.757	632.578
7	21.517	795.429
8	28.249	929.751
9	33.973	790.408
10	38.812	668.248
11	42.980	575.617
12	46.807	528.550
13	50.374	492.596
14	53.213	392.047
15	55.472	311.986
16	57.540	285.530
17	59.340	248.591
18	61.082	240.629
19	62.766	232.490
20	64.230	202.197
21	65.604	189.670
22	66.877	175.884
23	68.105	169.581
24	69.263	159.958
25	70.321	146.110
26	71.351	142.146
27	72.367	140.288
28	73.344	134.981
29	74.187	116.360
30	74.998	112.084
31	75.760	105.160
32	76.498	101.894
33	77.223	100.143
34	77.904	94.100
35	78.573	92.335
36	79.229	90.676
37	79.819	81.466
38	80.390	78.859
39	80.957	78.209
40	81.504	75.576
41	82.032	72.883
42	82.559	72.882
43	83.083	72.261
44	83.536	62.595
45	83.958	58.294
46	84.380	58.320
47	84.802	58.296
48	85.209	56.187
49	85.563	48.859
50	85.911	48.104
51	86.259	48.040
52	86.601	47.200
53	86.941	46.896
54	87.258	43.806
55	87.559	41.638
56	87.858	41.197
57	88.156	41.221
58	88.455	41.215
59	88.753	41.166
60	89.042	39.913
61	89.311	37.180
62	89.580	37.133

63	89.848	36.988
64	90.113	36.693
65	90.378	36.491
66	90.641	36.364
67	90.897	35.360
68	91.132	32.387
69	91.366	32.393
70	91.601	32.390
71	91.835	32.391
72	92.070	32.389
73	92.304	32.331
74	92.538	32.329
75	92.761	30.850
76	92.959	27.254
77	93.150	26.459
78	93.342	26.407
79	93.532	26.348
80	93.723	26.353
81	93.914	26.347
82	94.105	26.408
83	94.296	26.347
84	94.486	26.293
85	94.648	22.312
86	94.796	20.414
87	94.944	20.418
88	95.091	20.408
89	95.239	20.355
90	95.387	20.418
91	95.534	20.413
92	95.683	20.477
93	95.830	20.354
94	95.978	20.418
95	96.125	20.354
96	96.273	20.414
97	96.411	19.049
98	96.521	15.250
99	96.630	14.925
100	96.737	14.781
101	96.844	14.840
102	96.951	14.722
103	97.059	14.900
104	97.165	14.722
105	97.272	14.781
106	97.380	14.841
107	97.486	14.722
108	97.594	14.841
109	97.701	14.840
110	97.808	14.722
111	97.913	14.477
112	98.017	14.362
113	98.121	14.360
114	98.213	12.818
115	98.250	5.104
116	98.278	3.797
117	98.307	4.035
118	98.335	3.798
119	98.362	3.797
120	98.390	3.917
121	98.420	4.034
122	98.448	3.917
123	98.476	3.797
124	98.504	3.917
125	98.532	3.915
126	98.561	3.917
127	98.588	3.797
128	98.616	3.917
129	98.645	3.917
130	98.673	3.915

131	98.701	3.798
132	98.730	4.035
133	98.757	3.798
134	98.787	4.034
135	98.814	3.798
136	98.842	3.916
137	98.871	3.917
138	98.899	3.916
139	98.928	3.916
140	98.956	3.917
141	98.983	3.797
142	99.013	4.035
143	99.040	3.797
144	99.069	4.035
145	99.097	3.797
146	99.125	3.917
147	99.153	3.798
148	99.180	3.797
149	99.208	3.798
150	99.235	3.797

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 182.6838  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 70.2283  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	50.0	100.0	150.0	200.0
14.000	20.7393	42.27	.	Q .V	.	.	.
14.083	21.0348	42.90	.	Q .V	.	.	.
14.167	21.3350	43.59	.	Q .V	.	.	.
14.250	21.6402	44.32	.	Q .V	.	.	.
14.333	21.9507	45.08	.	Q .V	.	.	.
14.417	22.2666	45.88	.	Q .V	.	.	.
14.500	22.5886	46.75	.	Q .V	.	.	.
14.583	22.9169	47.68	.	Q .V	.	.	.
14.667	23.2522	48.68	.	Q .V	.	.	.
14.750	23.5942	49.66	.	Q .V	.	.	.
14.833	23.9428	50.62	.	Q .V	.	.	.
14.917	24.2981	51.59	.	Q .V	.	.	.
15.000	24.6602	52.58	.	Q .V	.	.	.
15.083	25.0293	53.59	.	Q .V	.	.	.
15.167	25.4054	54.61	.	Q .V	.	.	.
15.250	25.7887	55.66	.	.Q .V	.	.	.
15.333	26.1798	56.77	.	.Q .V	.	.	.
15.417	26.5776	57.77	.	.Q .V	.	.	.
15.500	26.9817	58.67	.	.Q .V	.	.	.
15.583	27.3921	59.59	.	.Q .V	.	.	.
15.667	27.8091	60.55	.	.Q .V	.	.	.
15.750	28.2309	61.25	.	.Q .V	.	.	.
15.833	28.6559	61.70	.	.Q .V	.	.	.
15.917	29.0844	62.23	.	.Q .V	.	.	.
16.000	29.5201	63.26	.	.Q .V	.	.	.
16.083	30.0583	78.14	.	.Q .V	.	.	.
16.167	30.6975	92.81	.	.Q .V	.	.	.
16.250	31.4049	102.72	.	.Q .V	.	.	.
16.333	32.1672	110.68	.	.Q .V	.	.	.
16.417	33.0311	125.44	.	.Q .V	.	.	.
16.500	34.0198	143.56	.	.Q .V	.	.	.
16.583	35.1463	163.55	.	.Q .V	.	.	.
16.667	36.3771	178.72	.	.Q .V	.	.	.
16.750	37.4953	162.37	.	.Q .V	.	.	.
16.833	38.5155	148.13	.	.Q .V	.	.	.
16.917	39.4610	137.28	.	.Q .V	.	.	.
17.000	40.3669	131.54	.	.Q .V	.	.	.
17.083	41.2378	126.45	.	.Q .V	.	.	.
17.167	42.0219	113.86	.	.Q .V	.	.	.
17.250	42.7359	103.68	.	.Q .V	.	.	.
17.333	43.4217	99.58	.	.Q .V	.	.	.
17.417	44.0717	94.38	.	.Q .V	.	.	.
17.500	44.7080	92.39	.	.Q .V	.	.	.
17.583	45.3291	90.18	.	.Q .V	.	.	.
17.667	45.9179	85.50	.	.Q .V	.	.	.
17.750	46.4892	82.95	.	.Q .V	.	.	.
17.833	47.0424	80.33	.	.Q .V	.	.	.
17.917	47.5839	78.62	.	.Q .V	.	.	.
18.000	48.1110	76.54	.	.Q .V	.	.	.
18.083	48.6204	73.96	.	.Q .V	.	.	.
18.167	49.1193	72.45	.	.Q .V	.	.	.
18.250	49.6090	71.10	.	.Q .V	.	.	.
18.333	50.0860	69.27	.	.Q .V	.	.	.
18.417	50.5399	65.90	.	.Q .V	.	.	.
18.500	50.9809	64.04	.	.Q .V	.	.	.
18.583	51.4061	61.74	.	.Q .V	.	.	.

18.667	51.8177	59.76	.	.Q	.	.V	.
18.750	52.2179	58.10	.	.Q	.	.V	.
18.833	52.6044	56.12	.	.Q	.	.V	.
18.917	52.9813	54.72	.	.Q	.	.V	.
19.000	53.3489	53.38	.	.Q	.	.V	.
19.083	53.7021	51.28	.	.Q	.	.V	.
19.167	54.0468	50.04	.	.Q	.	.V	.
19.250	54.3850	49.11	.	.Q	.	.V	.
19.333	54.7157	48.02	.	.Q	.	.V	.
19.417	55.0394	47.00	.	.Q	.	.V	.
19.500	55.3582	46.28	.	.Q	.	.V	.
19.583	55.6713	45.47	.	.Q	.	.V	.
19.667	55.9723	43.70	.	.Q	.	.V	.
19.750	56.2657	42.60	.	.Q	.	.V	.
19.833	56.5551	42.02	.	.Q	.	.V	.
19.917	56.8405	41.43	.	.Q	.	.V	.
20.000	57.1202	40.61	.	.Q	.	.V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LU39002E.FLD  
 TIME/DATE OF STUDY: 13:13 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1039.00 IS CODE = 1

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 >>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<  
 =====

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 1244.400 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.080 HOURS  
 VALLEY(DEVELOPED):  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.040  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.890  
 VALLEY(UNDEVELOPED)/DESERT:  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.740  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.94  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.46  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.67

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.944  
 30-MINUTE FACTOR = 0.944  
 1-HOUR FACTOR = 0.944  
 3-HOUR FACTOR = 0.992  
 6-HOUR FACTOR = 0.996  
 24-HOUR FACTOR = 0.998

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 7.716

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.826	124.321
2	2.468	247.101
3	4.586	318.814
4	7.121	381.445
5	10.373	489.447
6	14.462	615.343
7	19.741	794.441
8	25.825	915.578
9	31.885	911.999
10	36.836	745.203
11	40.944	618.149
12	44.811	582.046
13	48.379	536.860
14	51.516	472.184
15	53.979	370.579
16	56.127	323.319
17	57.959	275.759
18	59.675	258.179
19	61.326	248.421
20	62.923	240.378
21	64.302	207.551
22	65.610	196.871
23	66.824	182.628
24	68.001	177.223
25	69.114	167.511
26	70.133	153.279
27	71.120	148.492
28	72.090	146.033
29	73.047	144.051
30	73.885	126.030
31	74.667	117.689
32	75.420	113.356
33	76.125	106.099
34	76.826	105.540
35	77.503	101.793
36	78.143	96.413
37	78.779	95.761
38	79.392	92.214
39	79.944	83.092
40	80.488	81.769
41	81.027	81.234
42	81.546	77.996
43	82.049	75.756
44	82.552	75.718
45	83.053	75.372
46	83.491	65.916
47	83.894	60.617
48	84.297	60.614
49	84.699	60.575
50	85.098	59.972
51	85.446	52.361
52	85.778	50.022
53	86.110	49.984
54	86.439	49.582
55	86.763	48.737
56	87.082	47.981
57	87.374	43.983
58	87.661	43.075
59	87.945	42.809
60	88.230	42.839
61	88.514	42.803
62	88.799	42.840

63	89.071	40.972
64	89.328	38.601
65	89.584	38.564
66	89.840	38.491
67	90.093	38.121
68	90.344	37.862
69	90.596	37.871
70	90.844	37.259
71	91.070	34.080
72	91.293	33.591
73	91.517	33.674
74	91.741	33.659
75	91.964	33.659
76	92.188	33.607
77	92.411	33.664
78	92.634	33.534
79	92.834	30.070
80	93.020	28.025
81	93.202	27.401
82	93.384	27.381
83	93.567	27.461
84	93.749	27.378
85	93.931	27.390
86	94.113	27.455
87	94.295	27.378
88	94.477	27.327
89	94.633	23.581
90	94.774	21.220
91	94.915	21.218
92	95.056	21.141
93	95.197	21.217
94	95.338	21.218
95	95.479	21.215
96	95.619	21.146
97	95.761	21.280
98	95.901	21.151
99	96.042	21.214
100	96.183	21.214
101	96.324	21.214
102	96.445	18.162
103	96.549	15.722
104	96.652	15.450
105	96.754	15.419
106	96.856	15.349
107	96.958	15.347
108	97.061	15.418
109	97.163	15.347
110	97.265	15.349
111	97.367	15.416
112	97.469	15.348
113	97.571	15.281
114	97.673	15.416
115	97.775	15.416
116	97.877	15.347
117	97.976	14.782
118	98.075	14.918
119	98.173	14.782
120	98.234	9.221
121	98.261	4.069
122	98.288	4.068
123	98.315	4.068
124	98.342	4.069
125	98.369	4.068
126	98.396	3.933
127	98.424	4.203
128	98.450	3.934
129	98.478	4.203
130	98.504	3.934

131	98.531	4.068
132	98.559	4.205
133	98.584	3.797
134	98.612	4.203
135	98.639	4.068
136	98.666	4.069
137	98.693	4.068
138	98.719	3.933
139	98.746	4.069
140	98.773	4.068
141	98.800	4.068
142	98.828	4.205
143	98.854	3.933
144	98.881	4.068
145	98.909	4.205
146	98.936	4.069
147	98.962	3.797
148	98.989	4.068
149	99.016	4.068
150	99.044	4.205

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 196.5177  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 78.8663  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	50.0	100.0	150.0	200.0
14.000	23.2425	47.36	.	Q.V	.	.	.
14.083	23.5737	48.08	.	Q.V	.	.	.
14.167	23.9101	48.85	.	Q.V	.	.	.
14.250	24.2520	49.66	.	Q.V	.	.	.
14.333	24.5999	50.50	.	Q.V	.	.	.
14.417	24.9540	51.41	.	Q.V	.	.	.
14.500	25.3146	52.37	.	Q.V	.	.	.
14.583	25.6825	53.41	.	Q.V	.	.	.
14.667	26.0580	54.52	.	Q.V	.	.	.
14.750	26.4412	55.65	.	Q.V	.	.	.
14.833	26.8320	56.74	.	Q.V	.	.	.
14.917	27.2303	57.83	.	Q.V	.	.	.
15.000	27.6362	58.94	.	Q.V	.	.	.
15.083	28.0499	60.07	.	Q.V	.	.	.
15.167	28.4716	61.24	.	Q.V	.	.	.
15.250	28.9015	62.42	.	Q.V	.	.	.
15.333	29.3399	63.65	.	Q.V	.	.	.
15.417	29.7858	64.75	.	Q.V	.	.	.
15.500	30.2386	65.74	.	Q.V	.	.	.
15.583	30.6984	66.76	.	Q.V	.	.	.
15.667	31.1656	67.84	.	Q.V	.	.	.
15.750	31.6384	68.65	.	Q.V	.	.	.
15.833	32.1150	69.21	.	Q.V	.	.	.
15.917	32.5960	69.84	.	Q.V	.	.	.
16.000	33.0851	71.03	.	Q.V	.	.	.
16.083	33.6793	86.28	.	Q	.	.	.
16.167	34.3767	101.26	.	Q	Q	.	.
16.250	35.1377	110.50	.	Q	Q	Q	.
16.333	35.9557	118.77	.	Q	Q	Q	.
16.417	36.8683	132.51	.	Q	Q	Q	.
16.500	37.8933	148.83	.	Q	Q	Q	.
16.583	39.0698	170.83	.	Q	Q	Q	Q
16.667	40.3441	185.03	.	Q	Q	Q	Q
16.750	41.6121	184.11	.	Q	Q	Q	Q
16.833	42.7468	164.76	.	Q	Q	Q	Q
16.917	43.7818	150.28	.	Q	Q	Q	Q
17.000	44.7861	145.82	.	Q	Q	Q	Q
17.083	45.7502	139.99	.	Q	Q	Q	Q
17.167	46.6560	131.52	.	Q	Q	Q	Q
17.250	47.4743	118.82	.	Q	Q	Q	Q
17.333	48.2474	112.25	.	Q	Q	Q	Q
17.417	48.9758	105.76	.	Q	Q	Q	Q
17.500	49.6829	102.67	.	Q	Q	Q	Q
17.583	50.3735	100.29	.	Q	Q	Q	Q
17.667	51.0483	97.98	.	Q	Q	Q	Q
17.750	51.6884	92.95	.	Q	Q	Q	Q
17.833	52.3121	90.55	.	Q	Q	Q	Q
17.917	52.9171	87.85	.	Q	Q	Q	Q
18.000	53.5105	86.17	.	Q	Q	Q	Q
18.083	54.0881	83.87	.	Q	Q	Q	Q
18.167	54.6463	81.05	.	Q	Q	Q	Q
18.250	55.1924	79.30	.	Q	Q	Q	Q
18.333	55.7279	77.75	.	Q	Q	Q	Q
18.417	56.2522	76.12	.	Q	Q	Q	Q
18.500	56.7521	72.60	.	Q	Q	Q	Q
18.583	57.2345	70.03	.	Q	Q	Q	Q

18.667	57.7014	67.80	.	Q	.	.	V.	.
18.750	58.1512	65.30	.	Q	.	.	V.	.
18.833	58.5901	63.74	.	Q	.	.	V.	.
18.917	59.0170	61.98	.	Q	.	.	V.	.
19.000	59.4310	60.11	.	Q	.	.	V	.
19.083	59.8360	58.81	.	Q	.	.	V	.
19.167	60.2304	57.27	.	Q	.	.	V	.
19.250	60.6111	55.28	.	Q	.	.	V	.
19.333	60.9845	54.22	.	Q	.	.	V	.
19.417	61.3516	53.30	.	Q	.	.	V	.
19.500	61.7106	52.13	.	Q	.	.	V	.
19.583	62.0627	51.12	.	Q	.	.	V	.
19.667	62.4095	50.36	.	Q	.	.	V	.
19.750	62.7509	49.57	.	Q	.	.	V	.
19.833	63.0801	47.80	.	Q	.	.	V	.
19.917	63.4008	46.56	.	Q	.	.	V	.
20.000	63.7172	45.94	.	Q	.	.	V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LU40002E.FLD  
 TIME/DATE OF STUDY: 13:14 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1040.00 IS CODE = 1

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 >>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<  
 =====

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 1359.400 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.150 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.040  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.890  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.730  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.94  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.46  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.67

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.939  
 30-MINUTE FACTOR = 0.939  
 1-HOUR FACTOR = 0.939  
 3-HOUR FACTOR = 0.991  
 6-HOUR FACTOR = 0.995  
 24-HOUR FACTOR = 0.997

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 7.246

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.776	127.543
2	2.318	253.535
3	4.209	310.887
4	6.554	385.458
5	9.362	461.677
6	12.987	596.044
7	17.538	748.149
8	22.843	872.147
9	29.033	1017.602
10	34.006	817.579
11	38.413	724.522
12	42.156	615.362
13	45.674	578.435
14	48.996	546.109
15	51.836	466.883
16	54.102	372.581
17	56.124	332.379
18	57.846	283.124
19	59.464	265.949
20	61.025	256.742
21	62.543	249.507
22	63.886	220.847
23	65.142	206.367
24	66.300	190.470
25	67.438	187.091
26	68.505	175.334
27	69.521	167.036
28	70.457	154.021
29	71.377	151.225
30	72.288	149.672
31	73.178	146.410
32	73.950	126.840
33	74.683	120.621
34	75.392	116.494
35	76.054	108.856
36	76.715	108.565
37	77.357	105.685
38	77.962	99.454
39	78.561	98.438
40	79.154	97.398
41	79.689	88.060
42	80.203	84.395
43	80.711	83.565
44	81.214	82.702
45	81.692	78.621
46	82.165	77.716
47	82.637	77.636
48	83.106	77.049
49	83.510	66.466
50	83.888	62.203
51	84.266	62.128
52	84.645	62.240
53	85.022	62.008
54	85.360	55.553
55	85.672	51.336
56	85.984	51.316
57	86.295	51.156
58	86.601	50.281
59	86.905	49.978
60	87.195	47.578
61	87.465	44.478
62	87.733	44.096

63	88.000	43.875
64	88.268	44.001
65	88.535	43.874
66	88.802	43.914
67	89.059	42.258
68	89.299	39.509
69	89.540	39.528
70	89.781	39.580
71	90.020	39.294
72	90.256	38.870
73	90.492	38.865
74	90.728	38.781
75	90.951	36.574
76	91.161	34.527
77	91.370	34.449
78	91.580	34.522
79	91.790	34.528
80	92.000	34.522
81	92.210	34.527
82	92.420	34.448
83	92.630	34.522
84	92.819	31.054
85	92.994	28.800
86	93.165	28.171
87	93.336	28.125
88	93.507	28.131
89	93.678	28.045
90	93.850	28.210
91	94.020	28.045
92	94.192	28.204
93	94.362	28.051
94	94.530	27.498
95	94.669	22.841
96	94.801	21.736
97	94.933	21.741
98	95.065	21.741
99	95.197	21.737
100	95.330	21.736
101	95.462	21.820
102	95.595	21.736
103	95.727	21.742
104	95.859	21.734
105	95.992	21.820
106	96.123	21.657
107	96.256	21.815
108	96.384	21.027
109	96.486	16.687
110	96.583	16.057
111	96.680	15.970
112	96.776	15.733
113	96.872	15.734
114	96.967	15.733
115	97.064	15.892
116	97.159	15.655
117	97.256	15.812
118	97.352	15.812
119	97.447	15.655
120	97.543	15.812
121	97.639	15.813
122	97.735	15.655
123	97.832	15.970
124	97.925	15.325
125	98.017	15.144
126	98.111	15.460
127	98.199	14.512
128	98.242	6.941
129	98.266	4.102
130	98.291	4.100

131	98.317	4.261
132	98.342	4.102
133	98.367	4.100
134	98.393	4.260
135	98.418	4.102
136	98.444	4.260
137	98.469	4.102
138	98.495	4.258
139	98.520	4.103
140	98.546	4.258
141	98.571	4.102
142	98.596	4.102
143	98.620	3.943
144	98.646	4.260
145	98.671	4.260
146	98.696	4.102
147	98.721	4.102
148	98.747	4.258
149	98.771	3.943
150	98.798	4.418

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 211.8796  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 88.6361  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	75.0	150.0	225.0	300.0
14.000	25.9619	52.90	.	Q .V	.	.	.
14.083	26.3317	53.71	.	Q .V	.	.	.
14.167	26.7076	54.57	.	Q .V	.	.	.
14.250	27.0896	55.47	.	Q .V	.	.	.
14.333	27.4780	56.40	.	Q .V	.	.	.
14.417	27.8733	57.40	.	Q .V	.	.	.
14.500	28.2760	58.46	.	Q .V	.	.	.
14.583	28.6865	59.62	.	Q .V	.	.	.
14.667	29.1054	60.82	.	Q .V	.	.	.
14.750	29.5332	62.12	.	Q .V	.	.	.
14.833	29.9696	63.36	.	Q .V	.	.	.
14.917	30.4145	64.60	.	Q .V	.	.	.
15.000	30.8678	65.83	.	Q .V	.	.	.
15.083	31.3299	67.10	.	Q .V	.	.	.
15.167	31.8010	68.40	.	Q .V	.	.	.
15.250	32.2813	69.74	.	Q .V	.	.	.
15.333	32.7710	71.10	.	Q .V	.	.	.
15.417	33.2691	72.33	.	Q .V	.	.	.
15.500	33.7747	73.41	.	Q .V	.	.	.
15.583	34.2881	74.55	.	Q .V	.	.	.
15.667	34.8096	75.72	.	Q .V	.	.	.
15.750	35.3376	76.67	.	Q .V	.	.	.
15.833	35.8702	77.33	.	Q .V	.	.	.
15.917	36.4085	78.16	.	Q .V	.	.	.
16.000	36.9563	79.53	.	Q .V	.	.	.
16.083	37.6104	94.98	.	Q .V	.	.	.
16.167	38.3690	110.15	.	Q .V	.	.	.
16.250	39.1800	117.76	.	Q .V	.	.	.
16.333	40.0572	127.36	.	Q .V	.	.	.
16.417	41.0028	137.30	.	Q .V	.	.	.
16.500	42.0658	154.34	.	Q .V	.	.	.
16.583	43.2596	173.34	.	Q .V	Q	.	.
16.667	44.5587	188.64	.	Q .V	Q	.	.
16.750	45.9673	204.52	.	Q .V	Q	.	.
16.833	47.2188	181.72	.	Q .V	Q	.	.
16.917	48.3963	170.98	.	Q .V	Q	.	.
17.000	49.4877	158.47	.	Q .V	Q	.	.
17.083	50.5483	154.01	.	Q .V	Q	.	.
17.167	51.5767	149.32	.	Q .V	Q	.	.
17.250	52.5352	139.17	.	Q .V	Q	.	.
17.333	53.4121	127.34	.	Q .V	Q	.	.
17.417	54.2487	121.47	.	Q .V	Q	.	.
17.500	55.0388	114.73	.	Q .V	Q	.	.
17.583	55.8072	111.56	.	Q .V	Q	.	.
17.667	56.5588	109.14	.	Q .V	Q	.	.
17.750	57.2945	106.82	.	Q .V	Q	.	.
17.833	57.9984	102.21	.	Q .V	Q	.	.
17.917	58.6823	99.29	.	Q .V	Q	.	.
18.000	59.3459	96.36	.	Q .V	Q	.	.
18.083	59.9982	94.71	.	Q .V	Q	.	.
18.167	60.6316	91.98	.	Q .V	Q	.	.
18.250	61.2490	89.64	.	Q .V	Q	.	.
18.333	61.8468	86.80	.	Q .V	Q	.	.
18.417	62.4328	85.09	.	Q .V	Q	.	.
18.500	63.0068	83.35	.	Q .V	Q	.	.
18.583	63.5662	81.23	.	Q .V	Q	.	.

18.667	64.0979	77.20	.	Q	.	V	.
18.750	64.6113	74.55	.	Q	.	V	.
18.833	65.1099	72.40	.	Q	.	V	.
18.917	65.5921	70.01	.	Q	.	V	.
19.000	66.0642	68.55	.	Q	.	V	.
19.083	66.5248	66.87	.	Q	.	V	.
19.167	66.9717	64.90	.	Q	.	V	.
19.250	67.4096	63.59	.	Q	.	V	.
19.333	67.8392	62.37	.	Q	.	V	.
19.417	68.2548	60.34	.	Q	.	V	.
19.500	68.6613	59.03	.	Q	.	V	.
19.583	69.0612	58.06	.	Q	.	V	.
19.667	69.4544	57.10	.	Q	.	V	.
19.750	69.8390	55.84	.	Q	.	V	.
19.833	70.2177	54.99	.	Q	.	V	.
19.917	70.5912	54.23	.	Q	.	V	.
20.000	70.9590	53.41	.	Q	.	V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LU41002E.FLD  
TIME/DATE OF STUDY: 13:14 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1041.00 IS CODE = 1

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>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 1577.500 ACRES  
BASEFLOW = 0.000 CFS/SQUARE-MILE  
\*USER ENTERED "LAG" TIME = 1.200 HOURS  
VALLEY(DEVELOPED):  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.040  
MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.890  
VALLEY(UNDEVELOPED)/DESERT:  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
LOW LOSS FRACTION = 0.710  
\*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46  
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.94  
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.46  
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.67

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
5-MINUTE FACTOR = 0.930  
30-MINUTE FACTOR = 0.930  
1-HOUR FACTOR = 0.930  
3-HOUR FACTOR = 0.989  
6-HOUR FACTOR = 0.995  
24-HOUR FACTOR = 0.997

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 6.944

RUNOFF HYDROGRAPH LISTING LIMITS:  
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.743	141.839
2	2.222	282.153
3	3.973	333.888
4	6.211	427.034
5	8.780	490.051
6	12.066	626.938
7	16.169	782.726
8	21.140	948.462
9	26.870	1093.050
10	32.146	1006.709
11	36.626	854.545
12	40.332	707.046
13	43.904	681.475
14	47.132	615.888
15	50.212	587.518
16	52.705	475.732
17	54.709	382.300
18	56.654	371.058
19	58.220	298.796
20	59.759	293.486
21	61.246	283.799
22	62.698	277.010
23	63.965	241.698
24	65.167	229.334
25	66.277	211.660
26	67.369	208.354
27	68.395	195.725
28	69.380	187.962
29	70.282	172.141
30	71.168	169.010
31	72.041	166.601
32	72.908	165.354
33	73.688	148.704
34	74.395	135.002
35	75.088	132.184
36	75.738	124.018
37	76.372	120.914
38	77.000	119.759
39	77.600	114.492
40	78.175	109.742
41	78.748	109.245
42	79.306	106.533
43	79.807	95.644
44	80.298	93.665
45	80.785	92.882
46	81.265	91.607
47	81.722	87.058
48	82.175	86.396
49	82.628	86.437
50	83.078	85.901
51	83.471	74.949
52	83.833	69.167
53	84.196	69.158
54	84.558	69.108
55	84.921	69.210
56	85.261	64.940
57	85.562	57.313
58	85.861	57.084
59	86.160	57.039
60	86.456	56.428
61	86.747	55.607
62	87.037	55.223

63	87.302	50.686
64	87.561	49.323
65	87.817	48.874
66	88.073	48.885
67	88.329	48.840
68	88.585	48.837
69	88.841	48.885
70	89.084	46.262
71	89.315	44.015
72	89.545	44.011
73	89.776	43.973
74	90.005	43.631
75	90.231	43.277
76	90.458	43.171
77	90.684	43.168
78	90.902	41.563
79	91.104	38.484
80	91.305	38.400
81	91.506	38.401
82	91.707	38.394
83	91.908	38.299
84	92.109	38.404
85	92.311	38.394
86	92.512	38.394
87	92.709	37.542
88	92.881	32.853
89	93.048	31.786
90	93.212	31.316
91	93.375	31.212
92	93.539	31.314
93	93.703	31.220
94	93.867	31.310
95	94.031	31.313
96	94.195	31.221
97	94.359	31.308
98	94.520	30.742
99	94.655	25.673
100	94.781	24.153
101	94.908	24.248
102	95.035	24.146
103	95.162	24.153
104	95.289	24.239
105	95.416	24.248
106	95.542	24.152
107	95.669	24.147
108	95.796	24.246
109	95.923	24.147
110	96.050	24.240
111	96.176	24.144
112	96.303	24.242
113	96.419	22.045
114	96.512	17.840
115	96.606	17.842
116	96.698	17.514
117	96.790	17.565
118	96.881	17.376
119	96.974	17.757
120	97.066	17.474
121	97.157	17.471
122	97.250	17.661
123	97.341	17.474
124	97.433	17.471
125	97.525	17.568
126	97.617	17.565
127	97.709	17.570
128	97.800	17.375
129	97.892	17.615
130	97.981	16.810

131	98.070	17.001
132	98.159	17.001
133	98.227	12.989
134	98.253	4.966
135	98.277	4.585
136	98.300	4.394
137	98.325	4.774
138	98.349	4.585
139	98.373	4.585
140	98.397	4.583
141	98.422	4.776
142	98.446	4.585
143	98.470	4.583
144	98.494	4.585
145	98.519	4.776
146	98.543	4.583
147	98.567	4.585
148	98.591	4.585
149	98.615	4.583
150	98.640	4.777

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 239.3715  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 108.9512  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	75.0	150.0	225.0	300.0
14.000	32.0088	65.25	.	Q .V	.	.	.
14.083	32.4650	66.24	.	Q .V	.	.	.
14.167	32.9287	67.32	.	Q .V	.	.	.
14.250	33.4000	68.44	.	Q .V	.	.	.
14.333	33.8794	69.61	.	Q .V	.	.	.
14.417	34.3672	70.83	.	Q .V	.	.	.
14.500	34.8641	72.14	.	Q .V	.	.	.
14.583	35.3707	73.56	.	Q .V	.	.	.
14.667	35.8878	75.08	.	Q V	.	.	.
14.750	36.4160	76.70	.	Q V	.	.	.
14.833	36.9552	78.30	.	Q V	.	.	.
14.917	37.5053	79.86	.	Q V	.	.	.
15.000	38.0659	81.40	.	Q V	.	.	.
15.083	38.6373	82.98	.	.Q V	.	.	.
15.167	39.2199	84.59	.	.Q V	.	.	.
15.250	39.8139	86.25	.	.Q V	.	.	.
15.333	40.4196	87.94	.	.Q V	.	.	.
15.417	41.0355	89.43	.	.Q V	.	.	.
15.500	41.6606	90.77	.	.Q V	.	.	.
15.583	42.2951	92.13	.	.Q V	.	.	.
15.667	42.9392	93.52	.	.Q V	.	.	.
15.750	43.5912	94.67	.	.Q V	.	.	.
15.833	44.2490	95.51	.	.Q V	.	.	.
15.917	44.9140	96.56	.	.Q V	.	.	.
16.000	45.5900	98.16	.	Q V	.	.	.
16.083	46.3829	115.13	.	Q V	.	.	.
16.167	47.2893	131.61	.	Q	.	.	.
16.250	48.2443	138.67	.	VQ	.	.	.
16.333	49.2790	150.24	.	V Q	.	.	.
16.417	50.3722	158.74	.	V .Q	.	.	.
16.500	51.5839	175.94	.	V . Q	.	.	.
16.583	52.9294	195.37	.	V . Q	.	.	.
16.667	54.4138	215.53	.	V . Q	.	.	.
16.750	56.0092	231.65	.	V . Q	.	.	.
16.833	57.5355	221.62	.	.V	.	Q.	.
16.917	58.9432	204.40	.	.V	.	Q	.
17.000	60.2386	188.09	.	.V	.	Q	.
17.083	61.5126	184.99	.	.V Q	.	.	.
17.167	62.7314	176.97	.	.Q	.	.	.
17.250	63.9191	172.45	.	.QV	.	.	.
17.333	65.0111	158.56	.	.Q V	.	.	.
17.417	66.0230	146.93	.	Q .V	.	.	.
17.500	67.0144	143.94	.	Q .V	.	.	.
17.583	67.9411	134.56	.	Q .V	.	.	.
17.667	68.8531	132.43	.	Q .V	.	.	.
17.750	69.7457	129.60	.	Q .V	.	.	.
17.833	70.6210	127.10	.	Q .V	.	.	.
17.917	71.4582	121.57	.	Q .V	.	.	.
18.000	72.2757	118.70	.	Q .V	.	.	.
18.083	73.0691	115.19	.	Q .V	.	.	.
18.167	73.8484	113.17	.	Q .V	.	.	.
18.250	74.6063	110.04	.	Q .V	.	.	.
18.333	75.3460	107.40	.	Q .V	.	.	.
18.417	76.0619	103.95	.	Q .V	.	.	.
18.500	76.7630	101.80	.	Q .V	.	.	.
18.583	77.4485	99.55	.	Q .V	.	.	.

18.667	78.1179	97.19	.	.Q	.	V .	.
18.750	78.7583	92.99	.	.Q	.	V .	.
18.833	79.3732	89.29	.	.Q	.	V .	.
18.917	79.9724	87.01	.	.Q	.	V .	.
19.000	80.5536	84.39	.	.Q	.	V .	.
19.083	81.1209	82.37	.	Q	.	V .	.
19.167	81.6763	80.64	.	Q	.	V .	.
19.250	82.2172	78.55	.	Q	.	V	.
19.333	82.7453	76.67	.	Q	.	V	.
19.417	83.2644	75.37	.	Q	.	V	.
19.500	83.7728	73.82	.	Q.	.	V	.
19.583	84.2656	71.56	.	Q.	.	V	.
19.667	84.7498	70.31	.	Q.	.	.V	.
19.750	85.2264	69.20	.	Q.	.	.V	.
19.833	85.6951	68.06	.	Q.	.	.V	.
19.917	86.1541	66.65	.	Q .	.	.V	.
20.000	86.6067	65.71	.	Q .	.	.V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LU42002E.FLD  
 TIME/DATE OF STUDY: 13:15 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1042.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 1771.900 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.230 HOURS  
 VALLEY(DEVELOPED):  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.040  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.890  
 VALLEY(UNDEVELOPED)/DESERT:  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.710  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.94  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.46  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.67

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.921  
 30-MINUTE FACTOR = 0.921  
 1-HOUR FACTOR = 0.921  
 3-HOUR FACTOR = 0.988  
 6-HOUR FACTOR = 0.994  
 24-HOUR FACTOR = 0.996

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 6.775

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.725	155.433
2	2.169	309.322
3	3.843	358.697
4	6.019	466.250
5	8.468	524.961
6	11.578	666.476
7	15.443	828.060
8	20.233	1026.549
9	25.561	1141.692
10	31.086	1183.882
11	35.488	943.379
12	39.354	828.388
13	42.857	750.794
14	46.083	691.128
15	49.180	663.653
16	51.818	565.404
17	53.967	460.420
18	55.835	400.304
19	57.521	361.308
20	59.038	325.010
21	60.514	316.415
22	61.933	304.053
23	63.299	292.747
24	64.483	253.699
25	65.627	245.161
26	66.687	227.195
27	67.741	225.766
28	68.727	211.353
29	69.660	199.838
30	70.533	187.161
31	71.392	184.057
32	72.243	182.415
33	73.083	179.850
34	73.817	157.418
35	74.506	147.675
36	75.179	144.164
37	75.807	134.586
38	76.426	132.639
39	77.037	130.998
40	77.621	124.963
41	78.182	120.238
42	78.741	119.750
43	79.287	117.021
44	79.777	105.088
45	80.256	102.719
46	80.732	101.823
47	81.202	100.857
48	81.650	95.898
49	82.092	94.693
50	82.533	94.682
51	82.975	94.548
52	83.377	86.259
53	83.731	75.892
54	84.085	75.748
55	84.439	75.805
56	84.792	75.748
57	85.139	74.437
58	85.441	64.644
59	85.733	62.504
60	86.025	62.551
61	86.316	62.314
62	86.601	61.193

63	86.886	60.982
64	87.159	58.613
65	87.413	54.333
66	87.664	53.795
67	87.913	53.497
68	88.163	53.558
69	88.413	53.549
70	88.663	53.497
71	88.912	53.335
72	89.143	49.495
73	89.368	48.218
74	89.593	48.164
75	89.818	48.221
76	90.040	47.713
77	90.261	47.409
78	90.482	47.309
79	90.703	47.401
80	90.915	45.321
81	91.111	42.005
82	91.307	42.022
83	91.504	42.131
84	91.700	42.023
85	91.896	42.004
86	92.092	42.135
87	92.288	42.012
88	92.485	42.128
89	92.679	41.582
90	92.850	36.623
91	93.014	35.067
92	93.173	34.253
93	93.333	34.243
94	93.494	34.349
95	93.653	34.245
96	93.813	34.119
97	93.973	34.356
98	94.133	34.245
99	94.293	34.339
100	94.453	34.253
101	94.597	30.932
102	94.720	26.428
103	94.845	26.659
104	94.968	26.435
105	95.092	26.541
106	95.215	26.425
107	95.340	26.664
108	95.463	26.320
109	95.587	26.649
110	95.710	26.431
111	95.834	26.547
112	95.958	26.539
113	96.081	26.430
114	96.205	26.539
115	96.329	26.543
116	96.436	22.800
117	96.527	19.611
118	96.618	19.393
119	96.708	19.449
120	96.797	19.096
121	96.888	19.316
122	96.977	19.207
123	97.067	19.205
124	97.156	19.205
125	97.246	19.207
126	97.336	19.316
127	97.425	19.097
128	97.514	19.096
129	97.606	19.534
130	97.694	18.877

131	97.784	19.316
132	97.874	19.249
133	97.961	18.693
134	98.047	18.473
135	98.133	18.474
136	98.212	16.934
137	98.244	6.816
138	98.268	5.060
139	98.291	5.057
140	98.315	5.058
141	98.339	5.058
142	98.362	5.058
143	98.386	5.058
144	98.410	5.277
145	98.433	4.839
146	98.457	5.058
147	98.480	5.057
148	98.505	5.277
149	98.527	4.839
150	98.552	5.277

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 268.9244  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 122.0626  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	75.0	150.0	225.0	300.0
14.000	35.7218	72.85	.	Q.V	.	.	.
14.083	36.2312	73.97	.	Q.V	.	.	.
14.167	36.7489	75.18	.	Q V	.	.	.
14.250	37.2753	76.43	.	Q V	.	.	.
14.333	37.8109	77.76	.	Q V	.	.	.
14.417	38.3558	79.13	.	Q V	.	.	.
14.500	38.9110	80.60	.	Q V	.	.	.
14.583	39.4770	82.19	.	Q V	.	.	.
14.667	40.0549	83.92	.	.Q V	.	.	.
14.750	40.6454	85.74	.	.Q V	.	.	.
14.833	41.2487	87.60	.	.Q V	.	.	.
14.917	41.8642	89.37	.	.Q V	.	.	.
15.000	42.4918	91.13	.	.QV	.	.	.
15.083	43.1316	92.90	.	.Q V	.	.	.
15.167	43.7838	94.70	.	.Q V	.	.	.
15.250	44.4489	96.57	.	.Q V	.	.	.
15.333	45.1271	98.47	.	.QV	.	.	.
15.417	45.8166	100.12	.	.Q V	.	.	.
15.500	46.5162	101.58	.	.Q V	.	.	.
15.583	47.2262	103.09	.	.Q V	.	.	.
15.667	47.9466	104.60	.	.Q V	.	.	.
15.750	48.6755	105.84	.	.QV	.	.	.
15.833	49.4109	106.77	.	.Q V	.	.	.
15.917	50.1542	107.93	.	.Q V	.	.	.
16.000	50.9093	109.64	.	.Q V	.	.	.
16.083	51.7909	128.01	.	.VQ	.	.	.
16.167	52.7939	145.64	.	.V Q.	.	.	.
16.250	53.8441	152.48	.	.V Q	.	.	.
16.333	54.9835	165.44	.	.V . Q	.	.	.
16.417	56.1787	173.55	.	.V . Q	.	.	.
16.500	57.4943	191.03	.	.V . Q	.	.	.
16.583	58.9479	211.06	.	.V . Q	.	.	.
16.667	60.5641	234.68	.	.V . Q	.	.	.
16.750	62.2724	248.04	.	.V . Q	.	.	.
16.833	64.0078	251.97	.	.V . Q	.	.	.
16.917	65.5606	225.48	.	.V . Q	.	.	.
17.000	67.0267	212.87	.	.V . Q	.	.	.
17.083	68.4325	204.13	.	.V . Q	.	.	.
17.167	69.7906	197.20	.	.V . Q	.	.	.
17.250	71.1185	192.81	.	.V Q	.	.	.
17.333	72.3616	180.49	.	.VQ	.	.	.
17.417	73.5151	167.50	.	.Q V	.	.	.
17.500	74.6121	159.28	.	.Q V	.	.	.
17.583	75.6680	153.32	.	.Q V	.	.	.
17.667	76.6852	147.69	.	.Q V	.	.	.
17.750	77.6832	144.91	.	.Q V	.	.	.
17.833	78.6587	141.64	.	.Q V	.	.	.
17.917	79.6127	138.53	.	.Q V	.	.	.
18.000	80.5258	132.58	.	.Q V	.	.	.
18.083	81.4201	129.86	.	.Q V	.	.	.
18.167	82.2883	126.06	.	.Q V	.	.	.
18.250	83.1425	124.02	.	.Q V	.	.	.
18.333	83.9721	120.46	.	.Q V	.	.	.
18.417	84.7796	117.25	.	.Q V	.	.	.
18.500	85.5639	113.87	.	.Q V	.	.	.
18.583	86.3312	111.42	.	.Q V	.	.	.

18.667	87.0809	108.86	.	. Q	.	. V .	.
18.750	87.8110	106.01	.	. Q	.	. V .	.
18.833	88.5067	101.03	.	. Q	.	. V .	.
18.917	89.1801	97.77	.	. Q	.	. V .	.
19.000	89.8369	95.37	.	. Q	.	. V .	.
19.083	90.4739	92.49	.	. Q	.	. V .	.
19.167	91.0973	90.51	.	. Q	.	. V .	.
19.250	91.7074	88.59	.	. Q	.	. V	.
19.333	92.3023	86.38	.	. Q	.	. V	.
19.417	92.8841	84.48	.	. Q	.	. V	.
19.500	93.4564	83.09	.	. Q	.	. V	.
19.583	94.0176	81.49	.	. Q	.	. V	.
19.667	94.5618	79.02	.	. Q	.	. V	.
19.750	95.0965	77.64	.	. Q	.	. V	.
19.833	95.6229	76.44	.	. Q	.	. V	.
19.917	96.1413	75.26	.	. Q	.	. V	.
20.000	96.6491	73.73	.	. Q.	.	. V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LU43002E.FLD  
 TIME/DATE OF STUDY: 13:16 02/25/2004

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1000.00 TO NODE 1043.00 IS CODE = 1

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 >>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<  
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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 1927.800 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.290 HOURS  
 VALLEY(DEVELOPED):  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.040  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.890  
 VALLEY(UNDEVELOPED)/DESERT:  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.710  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.94  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.46  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.67

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.914  
 30-MINUTE FACTOR = 0.914  
 1-HOUR FACTOR = 0.914  
 3-HOUR FACTOR = 0.987  
 6-HOUR FACTOR = 0.994  
 24-HOUR FACTOR = 0.996

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 6.460

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.692	161.243
2	2.069	321.145
3	3.607	358.573
4	5.660	478.664
5	7.881	517.888
6	10.742	666.928
7	14.176	800.629
8	18.501	1008.249
9	23.260	1109.538
10	28.862	1306.175
11	33.369	1050.658
12	37.440	949.304
13	40.799	783.099
14	44.100	769.440
15	47.095	698.451
16	49.987	674.046
17	52.358	552.892
18	54.303	453.456
19	56.118	423.120
20	57.657	358.894
21	59.107	338.125
22	60.515	328.045
23	61.866	315.010
24	63.185	307.625
25	64.318	264.141
26	65.423	257.615
27	66.439	236.779
28	67.458	237.587
29	68.407	221.204
30	69.326	214.443
31	70.167	196.057
32	70.995	193.084
33	71.808	189.457
34	72.617	188.680
35	73.390	180.114
36	74.059	155.932
37	74.712	152.228
38	75.345	147.693
39	75.936	137.746
40	76.527	137.728
41	77.108	135.547
42	77.660	128.719
43	78.195	124.693
44	78.728	124.249
45	79.251	121.963
46	79.721	109.667
47	80.179	106.710
48	80.632	105.670
49	81.084	105.252
50	81.517	100.903
51	81.938	98.187
52	82.359	98.254
53	82.780	98.187
54	83.192	95.924
55	83.543	81.808
56	83.880	78.544
57	84.217	78.667
58	84.554	78.606
59	84.891	78.542
60	85.214	75.385
61	85.496	65.564
62	85.774	64.892

63	86.052	64.887
64	86.329	64.602
65	86.601	63.430
66	86.872	63.199
67	87.135	61.308
68	87.378	56.488
69	87.618	55.956
70	87.856	55.481
71	88.094	55.611
72	88.332	55.472
73	88.570	55.552
74	88.809	55.536
75	89.038	53.464
76	89.253	50.152
77	89.467	49.961
78	89.682	50.027
79	89.896	49.951
80	90.107	49.175
81	90.318	49.253
82	90.528	48.994
83	90.739	49.116
84	90.937	46.230
85	91.124	43.599
86	91.312	43.718
87	91.499	43.593
88	91.686	43.604
89	91.873	43.602
90	92.061	43.716
91	92.248	43.599
92	92.435	43.601
93	92.622	43.716
94	92.792	39.712
95	92.949	36.607
96	93.103	35.769
97	93.255	35.584
98	93.408	35.598
99	93.560	35.450
100	93.713	35.600
101	93.865	35.457
102	94.018	35.593
103	94.170	35.591
104	94.323	35.582
105	94.475	35.459
106	94.609	31.208
107	94.726	27.426
108	94.845	27.688
109	94.962	27.309
110	95.081	27.554
111	95.199	27.560
112	95.316	27.428
113	95.435	27.569
114	95.552	27.430
115	95.670	27.551
116	95.789	27.571
117	95.907	27.553
118	96.025	27.428
119	96.142	27.426
120	96.260	27.554
121	96.376	26.923
122	96.468	21.407
123	96.555	20.274
124	96.641	20.137
125	96.727	19.966
126	96.812	19.965
127	96.898	19.966
128	96.983	19.840
129	97.069	19.965
130	97.154	19.966

131	97.239	19.840
132	97.325	19.965
133	97.411	20.091
134	97.496	19.716
135	97.581	19.965
136	97.667	19.966
137	97.753	19.965
138	97.838	19.966
139	97.921	19.330
140	98.005	19.573
141	98.087	19.072
142	98.170	19.322
143	98.229	13.801
144	98.252	5.270
145	98.274	5.270
146	98.297	5.270
147	98.318	5.018
148	98.341	5.270
149	98.365	5.519
150	98.386	5.020

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 292.6331  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 132.4000  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	75.0	150.0	225.0	300.0
14.000	38.3686	78.31	.	QV	.	.	.
14.083	38.9161	79.50	.	QV	.	.	.
14.167	39.4726	80.81	.	QV	.	.	.
14.250	40.0383	82.14	.	Q V	.	.	.
14.333	40.6139	83.58	.	.QV	.	.	.
14.417	41.1996	85.04	.	.QV	.	.	.
14.500	41.7963	86.63	.	.QV	.	.	.
14.583	42.4044	88.29	.	.QV	.	.	.
14.667	43.0251	90.13	.	.Q	.	.	.
14.750	43.6589	92.04	.	.QV	.	.	.
14.833	44.3072	94.12	.	.QV	.	.	.
14.917	44.9688	96.08	.	.QV	.	.	.
15.000	45.6439	98.02	.	.Q	.	.	.
15.083	46.3320	99.91	.	.Q	.	.	.
15.167	47.0336	101.88	.	.QV	.	.	.
15.250	47.7489	103.85	.	.QV	.	.	.
15.333	48.4784	105.93	.	.Q	.	.	.
15.417	49.2202	107.70	.	.Q	.	.	.
15.500	49.9726	109.26	.	.QV	.	.	.
15.583	50.7363	110.88	.	.QV	.	.	.
15.667	51.5110	112.48	.	.QV	.	.	.
15.750	52.2948	113.82	.	.Q	.	.	.
15.833	53.0857	114.83	.	.QV	.	.	.
15.917	53.8855	116.13	.	.QV	.	.	.
16.000	54.6982	118.00	.	.QV	.	.	.
16.083	55.6415	136.97	.	.V Q	.	.	.
16.167	56.7082	154.88	.	.V Q	.	.	.
16.250	57.8125	160.34	.	.V .Q	.	.	.
16.333	59.0137	174.41	.	.V .Q	.	.	.
16.417	60.2570	180.54	.	.V .Q	.	.	.
16.500	61.6233	198.39	.	.V .Q	.	.	.
16.583	63.1053	215.18	.	.V .Q	.	.	.
16.667	64.7562	239.71	.	.V .Q	.	.	.
16.750	66.4941	252.35	.	.V .Q	.	.	.
16.833	68.3744	273.02	.	.V .Q	.	.	.
16.917	70.0635	245.25	.	.V .Q	.	.	.
17.000	71.6752	234.02	.	.V .Q	.	.	.
17.083	73.1626	215.97	.	.V .Q	.	.	.
17.167	74.6386	214.32	.	.V .Q	.	.	.
17.250	76.0555	205.74	.	.V .Q	.	.	.
17.333	77.4434	201.53	.	.V .Q	.	.	.
17.417	78.7296	186.75	.	.VQ	.	.	.
17.500	79.9312	174.47	.	.QV	.	.	.
17.583	81.0971	169.30	.	.Q V	.	.	.
17.667	82.2031	160.59	.	.Q V	.	.	.
17.750	83.2814	156.56	.	.Q V	.	.	.
17.833	84.3380	153.42	.	.Q V	.	.	.
17.917	85.3720	150.15	.	.Q V	.	.	.
18.000	86.3869	147.36	.	.Q V	.	.	.
18.083	87.3565	140.79	.	.Q V	.	.	.
18.167	88.3070	138.01	.	.Q V	.	.	.
18.250	89.2285	133.79	.	.Q V	.	.	.
18.333	90.1362	131.80	.	.Q V	.	.	.
18.417	91.0175	127.96	.	.Q V	.	.	.
18.500	91.8786	125.04	.	.Q V	.	.	.
18.583	92.7107	120.81	.	.Q V	.	.	.

18.667	93.5242	118.12	.	.Q	.	.V	.
18.750	94.3178	115.23	.	.Q	.	.V	.
18.833	95.0917	112.38	.	.Q	.	.V	.
18.917	95.8422	108.97	.	.Q	.	.V	.
19.000	96.5594	104.13	.	.Q	.	.V	.
19.083	97.2599	101.71	.	.Q	.	.V	.
19.167	97.9435	99.26	.	.Q	.	.V	.
19.250	98.6076	96.42	.	.Q	.	.V	.
19.333	99.2593	94.63	.	.Q	.	.V	.
19.417	99.8982	92.77	.	.Q	.	.V	.
19.500	100.5222	90.61	.	.Q	.	.V	.
19.583	101.1339	88.82	.	.Q	.	.V	.
19.667	101.7364	87.47	.	.Q	.	.V	.
19.750	102.3282	85.94	.	.Q	.	.V	.
19.833	102.9027	83.41	.	.Q	.	.V	.
19.917	103.4671	81.95	.	.Q	.	.V	.
20.000	104.0231	80.73	.	.Q	.	.V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LU44002E.FLD  
 TIME/DATE OF STUDY: 13:16 02/25/2004

\*\*\*\*\*

FLOW PROCESS FROM NODE 1000.00 TO NODE 1044.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 2017.400 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.370 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.040  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.890  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.710  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.94  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.46  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.66

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.910  
 30-MINUTE FACTOR = 0.910  
 1-HOUR FACTOR = 0.910  
 3-HOUR FACTOR = 0.986  
 6-HOUR FACTOR = 0.993  
 24-HOUR FACTOR = 0.996

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 6.083

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.651	158.884
2	1.950	316.775
3	3.337	338.378
4	5.231	462.175
5	7.231	488.101
6	9.745	613.297
7	12.800	745.239
8	16.481	898.125
9	20.881	1073.620
10	25.736	1184.505
11	30.766	1227.200
12	34.704	960.748
13	38.403	902.592
14	41.525	761.591
15	44.567	742.149
16	47.378	685.984
17	50.088	661.087
18	52.312	542.631
19	54.172	453.685
20	55.855	410.634
21	57.380	372.113
22	58.742	332.220
23	60.074	325.109
24	61.367	315.323
25	62.646	312.202
26	63.766	273.160
27	64.826	258.580
28	65.833	245.809
29	66.781	231.312
30	67.726	230.607
31	68.612	216.120
32	69.466	208.343
33	70.253	191.875
34	71.031	189.920
35	71.796	186.637
36	72.559	186.086
37	73.296	179.958
38	73.933	155.445
39	74.551	150.771
40	75.155	147.372
41	75.722	138.253
42	76.277	135.343
43	76.829	134.670
44	77.368	131.477
45	77.875	123.741
46	78.378	122.811
47	78.879	122.172
48	79.363	118.023
49	79.798	106.272
50	80.229	105.086
51	80.655	104.029
52	81.080	103.705
53	81.489	99.586
54	81.886	96.853
55	82.282	96.782
56	82.679	96.714
57	83.074	96.421
58	83.422	84.920
59	83.739	77.476
60	84.057	77.450
61	84.374	77.455
62	84.692	77.453

63	85.009	77.377
64	85.299	70.644
65	85.561	63.936
66	85.823	63.982
67	86.085	63.856
68	86.345	63.636
69	86.601	62.436
70	86.857	62.313
71	87.106	60.922
72	87.335	55.891
73	87.562	55.195
74	87.786	54.837
75	88.010	54.657
76	88.235	54.735
77	88.459	54.664
78	88.683	54.718
79	88.907	54.664
80	89.115	50.690
81	89.317	49.355
82	89.519	49.225
83	89.721	49.234
84	89.922	49.167
85	90.121	48.438
86	90.319	48.350
87	90.517	48.315
88	90.716	48.488
89	90.906	46.368
90	91.082	42.893
91	91.258	43.040
92	91.434	43.027
93	91.610	42.902
94	91.787	43.021
95	91.963	43.047
96	92.139	42.887
97	92.315	43.027
98	92.492	43.047
99	92.667	42.749
100	92.822	37.872
101	92.969	35.886
102	93.113	35.218
103	93.257	34.963
104	93.401	35.104
105	93.544	34.974
106	93.687	34.957
107	93.831	35.112
108	93.975	35.093
109	94.118	34.967
110	94.262	34.965
111	94.405	34.965
112	94.544	33.989
113	94.659	27.992
114	94.770	27.015
115	94.881	27.156
116	94.992	27.017
117	95.103	27.156
118	95.214	27.156
119	95.325	27.017
120	95.436	27.017
121	95.547	27.154
122	95.658	27.156
123	95.769	27.017
124	95.881	27.156
125	95.991	27.018
126	96.103	27.152
127	96.213	27.020
128	96.325	27.154
129	96.423	24.087
130	96.504	19.766

131	96.586	20.044
132	96.669	20.046
133	96.749	19.500
134	96.829	19.744
135	96.910	19.603
136	96.990	19.606
137	97.071	19.740
138	97.151	19.604
139	97.232	19.604
140	97.313	19.882
141	97.393	19.325
142	97.473	19.604
143	97.554	19.884
144	97.635	19.603
145	97.715	19.604
146	97.795	19.604
147	97.875	19.452
148	97.954	19.241
149	98.031	18.687
150	98.109	19.241

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 305.0738  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 137.5804  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	75.0	150.0	225.0	300.0
14.000	39.1890	80.44	.	QV	.	.	.
14.083	39.7518	81.72	.	QV	.	.	.
14.167	40.3238	83.06	.	.Q	.	.	.
14.250	40.9054	84.44	.	.Q	.	.	.
14.333	41.4970	85.90	.	.QV	.	.	.
14.417	42.0989	87.40	.	.QV	.	.	.
14.500	42.7118	88.99	.	.QV	.	.	.
14.583	43.3364	90.69	.	.Q	.	.	.
14.667	43.9735	92.51	.	.Q	.	.	.
14.750	44.6240	94.46	.	.Q	.	.	.
14.833	45.2887	96.50	.	.QV	.	.	.
14.917	45.9679	98.62	.	.Q	.	.	.
15.000	46.6609	100.63	.	.Q	.	.	.
15.083	47.3680	102.67	.	.Q	.	.	.
15.167	48.0888	104.65	.	.Q	.	.	.
15.250	48.8237	106.71	.	.Q	.	.	.
15.333	49.5731	108.81	.	.Q	.	.	.
15.417	50.3354	110.68	.	.Q	.	.	.
15.500	51.1087	112.29	.	.Q	.	.	.
15.583	51.8938	113.99	.	.Q	.	.	.
15.667	52.6902	115.64	.	.Q	.	.	.
15.750	53.4963	117.05	.	.Q	.	.	.
15.833	54.3099	118.14	.	.Q	.	.	.
15.917	55.1336	119.59	.	.QV	.	.	.
16.000	55.9711	121.61	.	.Q	.	.	.
16.083	56.9371	140.27	.	.V	.Q	.	.
16.167	58.0254	158.01	.	.V	.Q	.	.
16.250	59.1374	161.46	.	.V	.Q	.	.
16.333	60.3484	175.84	.	.V	.Q	.	.
16.417	61.5896	180.22	.	.V	.Q	.	.
16.500	62.9366	195.59	.	.V	.Q	.	.
16.583	64.3936	211.56	.	.V	.Q	.	.
16.667	65.9806	230.43	.	.V	.Q	.	.
16.750	67.7088	250.93	.	.V	.Q	.	.
16.833	69.5242	263.60	.	.V	.Q	.	.
16.917	71.3667	267.53	.	.V	.Q	.	.
17.000	73.0129	239.02	.	.V	.Q	.	.
17.083	74.6130	232.34	.	.V	.Q	.	.
17.167	76.1079	217.06	.	.V	.Q	.	.
17.250	77.5867	214.72	.	.V	.Q	.	.
17.333	79.0165	207.61	.	.V	.Q	.	.
17.417	80.4164	203.27	.	.V	.Q	.	.
17.500	81.7169	188.83	.	.V	.Q	.	.
17.583	82.9405	177.67	.	.QV	.	.	.
17.667	84.1195	171.19	.	.Q	.V	.	.
17.750	85.2569	165.15	.	.Q	.V	.	.
17.833	86.3521	159.01	.	.Q	.V	.	.
17.917	87.4285	156.30	.	.Q	.V	.	.
18.000	88.4850	153.41	.	.Q	.V	.	.
18.083	89.5248	150.98	.	.Q	.V	.	.
18.167	90.5212	144.68	.	.Q	.V	.	.
18.250	91.4926	141.05	.	.Q	.V	.	.
18.333	92.4396	137.51	.	.Q	.V	.	.
18.417	93.3618	133.90	.	.Q	.V	.	.
18.500	94.2684	131.64	.	.Q	.V	.	.
18.583	95.1487	127.82	.	.Q	.V	.	.

18.667	96.0065	124.56	.	.	.Q	.	.V	.
18.750	96.8347	120.26	.	.	.Q	.	.V	.
18.833	97.6439	117.48	.	.	.Q	.	.V	.
18.917	98.4325	114.51	.	.	.Q	.	.V	.
19.000	99.2046	112.11	.	.	.Q	.	.V	.
19.083	99.9563	109.15	.	.	.Q	.	.V	.
19.167	100.6764	104.55	.	.	.Q	.	.V	.
19.250	101.3797	102.11	.	.	.Q	.	.V	.
19.333	102.0676	99.89	.	.	.Q	.	.V	.
19.417	102.7370	97.19	.	.	.Q	.	.V	.
19.500	103.3932	95.29	.	.	.Q	.	.V	.
19.583	104.0387	93.73	.	.	.Q	.	.V	.
19.667	104.6722	91.98	.	.	.Q	.	.V	.
19.750	105.2912	89.88	.	.	.Q	.	.V	.
19.833	105.9011	88.56	.	.	.Q	.	.V	.
19.917	106.5021	87.26	.	.	.Q	.	.V	.
20.000	107.0915	85.59	.	.	.Q	.	.V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LU45002E.FLD  
 TIME/DATE OF STUDY: 13:16 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1045.00 IS CODE = 1

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 >>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<<  
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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 2335.400 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.480 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.040  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.890  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.710  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.93  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.44  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.64

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.896  
 30-MINUTE FACTOR = 0.896  
 1-HOUR FACTOR = 0.896  
 3-HOUR FACTOR = 0.984  
 6-HOUR FACTOR = 0.992  
 24-HOUR FACTOR = 0.995

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 5.631

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.603	170.258
2	1.806	339.882
3	3.032	346.291
4	4.722	477.216
5	6.547	515.584
6	8.666	598.401
7	11.245	728.378
8	14.308	865.112
9	18.060	1059.666
10	22.147	1154.460
11	26.983	1365.831
12	31.357	1235.242
13	34.988	1025.719
14	38.400	963.492
15	41.273	811.630
16	44.135	808.109
17	46.745	737.145
18	49.319	727.102
19	51.526	623.453
20	53.400	529.048
21	54.919	429.171
22	56.555	461.972
23	57.815	355.881
24	59.084	358.616
25	60.312	346.800
26	61.496	334.445
27	62.687	336.121
28	63.719	291.648
29	64.702	277.722
30	65.647	266.854
31	66.523	247.327
32	67.416	252.356
33	68.245	233.870
34	69.060	230.217
35	69.810	211.985
36	70.537	205.165
37	71.251	201.737
38	71.959	200.002
39	72.664	199.022
40	73.341	191.430
41	73.927	165.465
42	74.500	161.696
43	75.061	158.500
44	75.594	150.568
45	76.105	144.367
46	76.620	145.293
47	77.126	143.009
48	77.607	135.944
49	78.074	131.772
50	78.539	131.339
51	79.002	130.697
52	79.440	123.765
53	79.840	113.051
54	80.239	112.624
55	80.633	111.428
56	81.028	111.320
57	81.409	107.819
58	81.777	103.783
59	82.144	103.690
60	82.511	103.699
61	82.878	103.686
62	83.232	100.042



63	83.534	85.236
64	83.828	83.049
65	84.122	83.045
66	84.416	82.872
67	84.710	83.043
68	85.004	83.047
69	85.274	76.335
70	85.517	68.586
71	85.759	68.545
72	86.002	68.448
73	86.244	68.511
74	86.483	67.302
75	86.719	66.821
76	86.955	66.724
77	87.179	63.251
78	87.389	59.223
79	87.599	59.148
80	87.806	58.682
81	88.014	58.669
82	88.221	58.594
83	88.429	58.601
84	88.637	58.753
85	88.844	58.596
86	89.043	56.144
87	89.230	52.761
88	89.417	52.823
89	89.604	52.843
90	89.791	52.744
91	89.976	52.373
92	90.161	52.091
93	90.344	51.707
94	90.527	51.862
95	90.711	51.905
96	90.888	49.942
97	91.051	46.137
98	91.215	46.124
99	91.377	45.958
100	91.541	46.120
101	91.704	46.133
102	91.867	45.950
103	92.030	46.137
104	92.193	46.124
105	92.357	46.120
106	92.519	45.950
107	92.681	45.624
108	92.823	40.185
109	92.960	38.638
110	93.094	37.809
111	93.227	37.453
112	93.359	37.438
113	93.492	37.647
114	93.625	37.440
115	93.758	37.623
116	93.891	37.464
117	94.023	37.449
118	94.157	37.636
119	94.290	37.615
120	94.422	37.285
121	94.551	36.404
122	94.656	29.605
123	94.759	29.088
124	94.861	28.907
125	94.964	29.079
126	95.067	29.082
127	95.169	28.916
128	95.272	29.069
129	95.375	29.092
130	95.478	29.088

131	95.580	28.894
132	95.683	29.092
133	95.786	29.092
134	95.889	28.892
135	95.992	29.066
136	96.095	29.069
137	96.197	29.069
138	96.300	28.892
139	96.398	27.674
140	96.474	21.570
141	96.550	21.395
142	96.626	21.393
143	96.701	21.160
144	96.776	21.247
145	96.850	20.900
146	96.924	20.900
147	96.999	21.247
148	97.074	21.074
149	97.148	20.898
150	97.222	21.074

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 350.5300  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 156.2987  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	75.0	150.0	225.0	300.0
14.000	44.2129	89.55	.	.Q	.	.	.
14.083	44.8392	90.94	.	.VQ	.	.	.
14.167	45.4760	92.46	.	.VQ	.	.	.
14.250	46.1234	94.01	.	.VQ	.	.	.
14.333	46.7820	95.63	.	.VQ	.	.	.
14.417	47.4520	97.28	.	.Q	.	.	.
14.500	48.1340	99.02	.	.VQ	.	.	.
14.583	48.8286	100.85	.	.VQ	.	.	.
14.667	49.5367	102.83	.	.VQ	.	.	.
14.750	50.2594	104.94	.	.VQ	.	.	.
14.833	50.9974	107.15	.	.VQ	.	.	.
14.917	51.7517	109.53	.	.VQ	.	.	.
15.000	52.5222	111.87	.	.VQ	.	.	.
15.083	53.3083	114.14	.	.V Q	.	.	.
15.167	54.1103	116.45	.	.V Q	.	.	.
15.250	54.9281	118.74	.	.VQ	.	.	.
15.333	55.7623	121.12	.	.V Q	.	.	.
15.417	56.6107	123.19	.	.V Q	.	.	.
15.500	57.4720	125.06	.	.V Q	.	.	.
15.583	58.3469	127.03	.	.V Q	.	.	.
15.667	59.2347	128.91	.	.V Q	.	.	.
15.750	60.1333	130.48	.	.V Q	.	.	.
15.833	61.0414	131.85	.	.V Q	.	.	.
15.917	61.9614	133.58	.	.V Q	.	.	.
16.000	62.8979	135.97	.	.V Q	.	.	.
16.083	63.9700	155.68	.	.V	.Q	.	.
16.167	65.1725	174.60	.	.V	.Q	.	.
16.250	66.3882	176.53	.	.V	.Q	.	.
16.333	67.7049	191.18	.	.V	.Q	.Q	.
16.417	69.0595	196.69	.	.V	.Q	.Q	.
16.500	70.4879	207.41	.	.V	.Q	.Q	.
16.583	72.0225	222.81	.	.V	.Q	.Q	.
16.667	73.6712	239.40	.	.V	.Q	.Q	.
16.750	75.4757	262.01	.	.V	.Q	.Q	.
16.833	77.3614	273.81	.	.V	.Q	.Q	.
16.917	79.3997	295.95	.	.V	.Q	.Q	.
17.000	81.3406	281.83	.	.V	.Q	.Q	.
17.083	83.1314	260.02	.	.V	.Q	.Q	.
17.167	84.8713	252.64	.	.V	.Q	.Q	.
17.250	86.5018	236.74	.	.V	.Q	.Q	.
17.333	88.1258	235.81	.	.V	.Q	.Q	.
17.417	89.6919	227.39	.	.V	.Q	.Q	.
17.500	91.2385	224.57	.	.V	.Q	.Q	.
17.583	92.6962	211.66	.	.V	.Q	.Q	.
17.667	94.0729	199.89	.	.V Q	.	.	.
17.750	95.3651	187.62	.	.VQ	.	.	.
17.833	96.6646	188.69	.	.VQ	.	.	.
17.917	97.8731	175.48	.	.Q V	.	.	.
18.000	99.0697	173.74	.	.Q V	.	.	.
18.083	100.2421	170.24	.	.Q V	.	.	.
18.167	101.3903	166.71	.	.Q V	.	.	.
18.250	102.5230	164.47	.	.Q V	.	.	.
18.333	103.6073	157.44	.	.Q V	.	.	.
18.417	104.6655	153.66	.	.Q V	.	.	.
18.500	105.6992	150.09	.	.Q V	.	.	.
18.583	106.7026	145.70	.	.Q V	.	.	.

18.667	107.6920	143.66	.	.	.Q	.	V	.
18.750	108.6501	139.10	.	.	.Q	.	V	.
18.833	109.5863	135.95	.	.	.Q	.	V	.
18.917	110.4894	131.13	.	.	.Q	.	V	.
19.000	111.3692	127.75	.	.	.Q	.	V	.
19.083	112.2303	125.03	.	.	.Q	.	V	.
19.167	113.0745	122.58	.	.	.Q	.	V	.
19.250	113.9030	120.29	.	.	.Q	.	V	.
19.333	114.7110	117.32	.	.	.Q	.	V	.
19.417	115.4870	112.67	.	.	.Q	.	V	.
19.500	116.2470	110.36	.	.	.Q	.	V	.
19.583	116.9925	108.24	.	.	.Q	.	V	.
19.667	117.7212	105.80	.	.	.Q	.	V	.
19.750	118.4354	103.71	.	.	.Q	.	V	.
19.833	119.1401	102.32	.	.	.Q	.	V	.
19.917	119.8337	100.72	.	.	.Q	.	V	.
20.000	120.5132	98.66	.	.	.Q	.	V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS
USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)
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Analysis prepared by:

Huitt - Zollars, Inc.
430 Exchange, Suite 200
Irvine, CA. 92602-1309
714 - 734 - 5100

FILE NAME: LU46002E.FLD
TIME/DATE OF STUDY: 13:17 02/25/2004

\*\*\*\*\*

FLOW PROCESS FROM NODE 1000.00 TO NODE 1046.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 2446.000 ACRES
BASEFLOW = 0.000 CFS/SQUARE-MILE
\*USER ENTERED "LAG" TIME = 1.570 HOURS
VALLEY(DEVELOPED):
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010
FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.040
MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.890
VALLEY(UNDEVELOPED)/DESERT:
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060
DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600
LOW LOSS FRACTION = 0.710
\*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.93
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.43
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.61

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
5-MINUTE FACTOR = 0.891
30-MINUTE FACTOR = 0.891
1-HOUR FACTOR = 0.891
3-HOUR FACTOR = 0.984
6-HOUR FACTOR = 0.992
24-HOUR FACTOR = 0.995

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 5.308

RUNOFF HYDROGRAPH LISTING LIMITS:
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00
MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

Table with 3 columns: INTERVAL NUMBER, "S" GRAPH MEAN VALUES, and UNIT HYDROGRAPH ORDINATES (CFS). It lists 62 intervals with corresponding values for each column.

63	82.297	102.320
64	82.643	102.340
65	82.989	102.304
66	83.311	95.247
67	83.590	82.387
68	83.867	82.062
69	84.144	81.879
70	84.421	81.877
71	84.698	82.062
72	84.975	81.879
73	85.235	77.099
74	85.466	68.133
75	85.694	67.517
76	85.923	67.704
77	86.151	67.519
78	86.378	67.217
79	86.601	65.973
80	86.824	65.908
81	87.045	65.422
82	87.249	60.107
83	87.447	58.643
84	87.643	58.110
85	87.839	57.932
86	88.035	57.929
87	88.230	57.826
88	88.426	57.932
89	88.622	57.936
90	88.818	57.918
91	89.008	56.194
92	89.184	52.208
93	89.361	52.312
94	89.537	52.014
95	89.713	52.111
96	89.890	52.188
97	90.063	51.371
98	90.236	50.999
99	90.409	51.373
100	90.582	51.172
101	90.756	51.362
102	90.918	48.069
103	91.072	45.573
104	91.226	45.356
105	91.380	45.555
106	91.533	45.352
107	91.687	45.553
108	91.841	45.566
109	91.995	45.560
110	92.148	45.343
111	92.302	45.372
112	92.456	45.754
113	92.609	45.142
114	92.755	43.050
115	92.884	38.195
116	93.011	37.721
117	93.136	37.044
118	93.262	37.211
119	93.387	36.837
120	93.513	37.211
121	93.637	36.825
122	93.763	37.250
123	93.888	37.017
124	94.013	37.017
125	94.139	37.238
126	94.264	36.823
127	94.390	37.238
128	94.513	36.616
129	94.618	30.845
130	94.715	28.881

131	94.812	28.504
132	94.909	28.701
133	95.006	28.698
134	95.103	28.687
135	95.199	28.518
136	95.297	28.870
137	95.394	28.710
138	95.490	28.507
139	95.587	28.685
140	95.683	28.504
141	95.781	28.895
142	95.877	28.493
143	95.974	28.687
144	96.071	28.687
145	96.168	28.685
146	96.265	28.493
147	96.361	28.493
148	96.440	23.453
149	96.511	20.937
150	96.582	21.129

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 362.8538  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 160.7623  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	100.0	200.0	300.0	400.0
14.000	44.6747	90.36	.	Q.V	.	.	.
14.083	45.3067	91.77	.	Q.V	.	.	.
14.167	45.9496	93.34	.	Q.V	.	.	.
14.250	46.6033	94.92	.	Q.V	.	.	.
14.333	47.2687	96.61	.	Q.V	.	.	.
14.417	47.9462	98.38	.	Q.V	.	.	.
14.500	48.6360	100.15	.	Q V	.	.	.
14.583	49.3389	102.07	.	Q V	.	.	.
14.667	50.0558	104.09	.	Q V	.	.	.
14.750	50.7875	106.25	.	Q V	.	.	.
14.833	51.5355	108.60	.	Q V	.	.	.
14.917	52.2999	110.99	.	.Q V	.	.	.
15.000	53.0824	113.62	.	.Q V	.	.	.
15.083	53.8818	116.08	.	.Q V	.	.	.
15.167	54.6981	118.52	.	.Q V	.	.	.
15.250	55.5311	120.96	.	.QV	.	.	.
15.333	56.3811	123.42	.	.Q V	.	.	.
15.417	57.2464	125.64	.	.Q V	.	.	.
15.500	58.1252	127.60	.	.Q V	.	.	.
15.583	59.0186	129.72	.	.Q V	.	.	.
15.667	59.9260	131.75	.	.QV	.	.	.
15.750	60.8449	133.43	.	.Q V	.	.	.
15.833	61.7740	134.91	.	.Q V	.	.	.
15.917	62.7161	136.78	.	.Q V	.	.	.
16.000	63.6755	139.31	.	.Q V	.	.	.
16.083	64.7690	158.78	.	.QV	.	.	.
16.167	65.9907	177.39	.	.VQ	.	.	.
16.250	67.2222	178.81	.	.VQ	.	.	.
16.333	68.5423	191.67	.	.V Q.	.	.	.
16.417	69.9112	198.76	.	.V Q.	.	.	.
16.500	71.3189	204.40	.	.V Q	.	.	.
16.583	72.8426	221.25	.	.V . Q	.	.	.
16.667	74.4601	234.85	.	.V . Q	.	.	.
16.750	76.1993	252.53	.	.V . Q	.	.	.
16.833	78.0855	273.88	.	.V . Q	.	.	.
16.917	79.9995	277.91	.	.V . Q	.	.	.
17.000	82.0845	302.74	.	.V . Q	.	.	.
17.083	83.9642	272.94	.	.V . Q	.	.	.
17.167	85.7651	261.48	.	.V . Q	.	.	.
17.250	87.4840	249.59	.	.V . Q	.	.	.
17.333	89.1335	239.51	.	.VQ	.	.	.
17.417	90.7658	237.01	.	.VQ	.	.	.
17.500	92.3463	229.49	.	.Q	.	.	.
17.583	93.9093	226.93	.	.QV	.	.	.
17.667	95.3903	215.04	.	.Q V	.	.	.
17.750	96.7899	203.23	.	.Q . V	.	.	.
17.833	98.1110	191.82	.	.Q . V	.	.	.
17.917	99.4232	190.52	.	.Q . V	.	.	.
18.000	100.6666	180.55	.	.Q . V	.	.	.
18.083	101.8765	175.67	.	.Q . V	.	.	.
18.167	103.0639	172.41	.	.Q . V	.	.	.
18.250	104.2320	169.61	.	.Q . V	.	.	.
18.333	105.3728	165.64	.	.Q . V	.	.	.
18.417	106.4954	163.00	.	.Q . V	.	.	.
18.500	107.5665	155.52	.	.Q . V	.	.	.
18.583	108.6186	152.76	.	.Q . V	.	.	.

18.667	109.6430	148.75	.	. Q	.	. V	.
18.750	110.6385	144.54	.	. Q	.	. V	.
18.833	111.6196	142.45	.	. Q	.	. V	.
18.917	112.5676	137.65	.	. Q	.	. V	.
19.000	113.4939	134.50	.	. Q	.	. V	.
19.083	114.3902	130.13	.	. Q	.	. V	.
19.167	115.2645	126.96	.	. Q	.	. V	.
19.250	116.1220	124.51	.	. Q	.	. V	.
19.333	116.9639	122.23	.	. Q	.	. V	.
19.417	117.7911	120.11	.	. Q	.	. V	.
19.500	118.6025	117.82	.	.Q	.	. V	.
19.583	119.3845	113.54	.	.Q	.	. V	.
19.667	120.1463	110.62	.	.Q	.	. V	.
19.750	120.8953	108.74	.	.Q	.	. V	.
19.833	121.6313	106.88	.	.Q	.	. V	.
19.917	122.3499	104.34	.	.Q	.	. V	.
20.000	123.0585	102.89	.	.Q	.	. V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LU47002E.FLD  
 TIME/DATE OF STUDY: 13:17 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1047.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 4301.800 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.580 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.040  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.890  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.720  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.93  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.44  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.63

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.808  
 30-MINUTE FACTOR = 0.808  
 1-HOUR FACTOR = 0.808  
 3-HOUR FACTOR = 0.971  
 6-HOUR FACTOR = 0.986  
 24-HOUR FACTOR = 0.991

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 5.274

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.565	293.766
2	1.693	586.947
3	2.813	582.893
4	4.321	784.406
5	6.025	886.654
6	7.834	940.795
7	10.122	1190.295
8	12.798	1392.178
9	15.947	1638.326
10	19.738	1972.328
11	23.594	2006.164
12	28.320	2458.500
13	32.139	1987.128
14	35.529	1763.779
15	38.641	1618.745
16	41.330	1399.136
17	44.017	1398.000
18	46.465	1273.422
19	48.893	1262.967
20	51.050	1122.104
21	52.869	946.303
22	54.399	796.336
23	55.877	768.736
24	57.218	697.751
25	58.392	610.532
26	59.558	606.997
27	60.705	596.529
28	61.799	569.016
29	62.910	577.913
30	63.850	489.029
31	64.770	479.053
32	65.654	459.513
33	66.473	426.417
34	67.312	436.328
35	68.094	406.794
36	68.861	399.145
37	69.585	376.803
38	70.265	353.496
39	70.941	351.936
40	71.605	345.383
41	72.268	344.672
42	72.924	341.644
43	73.530	315.197
44	74.069	280.316
45	74.604	278.156
46	75.128	272.667
47	75.623	257.628
48	76.102	249.070
49	76.584	251.051
50	77.059	246.820
51	77.516	237.861
52	77.953	227.264
53	78.389	227.065
54	78.824	225.922
55	79.251	222.266
56	79.635	200.106
57	80.010	194.931
58	80.381	193.176
59	80.751	192.386
60	81.119	191.271
61	81.472	183.813
62	81.816	179.026

63	82.160	179.018
64	82.504	178.847
65	82.848	178.844
66	83.185	175.327
67	83.473	150.031
68	83.748	143.041
69	84.024	143.232
70	84.299	143.216
71	84.574	143.236
72	84.849	143.216
73	85.121	141.351
74	85.359	123.835
75	85.586	118.198
76	85.814	118.182
77	86.040	118.004
78	86.267	118.055
79	86.491	116.190
80	86.712	115.039
81	86.934	115.352
82	87.146	110.415
83	87.343	102.675
84	87.540	102.290
85	87.734	101.230
86	87.929	101.071
87	88.123	101.258
88	88.318	101.111
89	88.512	101.393
90	88.706	100.920
91	88.901	101.286
92	89.083	94.383
93	89.258	91.129
94	89.433	90.994
95	89.608	91.109
96	89.783	91.005
97	89.958	91.065
98	90.129	89.247
99	90.301	89.148
100	90.474	90.220
101	90.645	89.148
102	90.816	88.826
103	90.973	81.606
104	91.126	79.535
105	91.278	79.221
106	91.431	79.550
107	91.584	79.566
108	91.737	79.515
109	91.890	79.582
110	92.042	79.205
111	92.196	79.876
112	92.348	79.229
113	92.501	79.542
114	92.653	79.209
115	92.791	71.644
116	92.919	66.817
117	93.044	65.206
118	93.169	64.856
119	93.294	64.833
120	93.418	64.491
121	93.543	65.178
122	93.667	64.507
123	93.792	64.813
124	93.916	64.853
125	94.040	64.491
126	94.165	64.833
127	94.289	64.829
128	94.414	64.833
129	94.536	63.463
130	94.636	52.143

131	94.733	50.107
132	94.829	50.063
133	94.925	50.111
134	95.021	50.063
135	95.118	50.135
136	95.214	50.059
137	95.310	50.087
138	95.406	50.087
139	95.502	49.742
140	95.598	50.111
141	95.695	50.405
142	95.792	50.111
143	95.888	50.087
144	95.984	50.083
145	96.080	50.091
146	96.177	50.083
147	96.273	50.087
148	96.369	50.087
149	96.445	39.454
150	96.516	36.715

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 653.3447  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 271.3764  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	125.0	250.0	375.0	500.0
14.000	76.4864	156.34	.	.VQ	.	.	.
14.083	77.5805	158.86	.	.VQ	.	.	.
14.167	78.6946	161.76	.	.VQ	.	.	.
14.250	79.8288	164.68	.	.V Q	.	.	.
14.333	80.9847	167.84	.	.V Q	.	.	.
14.417	82.1635	171.17	.	.VQ	.	.	.
14.500	83.3653	174.50	.	.VQ	.	.	.
14.583	84.5922	178.14	.	.V Q	.	.	.
14.667	85.8459	182.04	.	.V Q	.	.	.
14.750	87.1284	186.21	.	.V Q	.	.	.
14.833	88.4426	190.82	.	.V Q	.	.	.
14.917	89.7888	195.47	.	.V Q	.	.	.
15.000	91.1708	200.67	.	.V Q	.	.	.
15.083	92.5853	205.37	.	.V Q	.	.	.
15.167	94.0307	209.88	.	.V Q	.	.	.
15.250	95.5066	214.30	.	.V Q	.	.	.
15.333	97.0120	218.58	.	.V Q	.	.	.
15.417	98.5427	222.25	.	.V Q	.	.	.
15.500	100.0940	225.25	.	.V Q	.	.	.
15.583	101.6674	228.46	.	.V Q	.	.	.
15.667	103.2604	231.30	.	.V Q	.	.	.
15.750	104.8679	233.41	.	.V Q	.	.	.
15.833	106.4870	235.11	.	.V Q	.	.	.
15.917	108.1205	237.18	.	.V Q	.	.	.
16.000	109.7741	240.10	.	.V Q	.	.	.
16.083	111.6224	268.38	.	.V .Q	.	.	.
16.167	113.6548	295.11	.	.V . Q	.	.	.
16.250	115.6921	295.82	.	.V . Q	.	.	.
16.333	117.8492	313.20	.	.V . Q Q	.	.	.
16.417	120.0744	323.10	.	.V . Q Q	.	.	.
16.500	122.3490	330.27	.	.V . Q Q	.	.	.
16.583	124.7936	354.96	.	.V . Q Q	.	.	.
16.667	127.3800	375.53	.	.V . Q Q	.	.	.
16.750	130.1407	400.86	.	.V . Q Q	.	.	.
16.833	133.1270	433.61	.	.V . Q Q	.	.	.
16.917	136.1549	439.65	.	.V . Q Q	.	.	.
17.000	139.4589	479.75	.	.V . Q Q	.	.	.
17.083	142.4732	437.68	.	.V . Q Q	.	.	.
17.167	145.3554	418.49	.	.V . Q Q	.	.	.
17.250	148.1457	405.15	.	.V . Q Q	.	.	.
17.333	150.8090	386.71	.	.V . Q Q	.	.	.
17.417	153.4711	386.54	.	.V . Q Q	.	.	.
17.500	156.0528	374.87	.	.V . Q Q	.	.	.
17.583	158.6149	372.01	.	.V . Q Q	.	.	.
17.667	161.0697	356.45	.	.V . Q Q	.	.	.
17.750	163.3965	337.85	.	.V . Q Q	.	.	.
17.833	165.6099	321.38	.	.V Q	.	.	.
17.917	167.7831	315.54	.	.V Q	.	.	.
18.000	169.8846	305.15	.	.QV	.	.	.
18.083	171.9066	293.59	.	.Q V	.	.	.
18.167	173.8981	289.17	.	.Q V	.	.	.
18.250	175.8559	284.28	.	.Q V	.	.	.
18.333	177.7692	277.81	.	.Q V	.	.	.
18.417	179.6571	274.12	.	.Q V	.	.	.
18.500	181.4622	262.10	.	.Q V	.	.	.
18.583	183.2313	256.87	.	.Q V	.	.	.

18.667	184.9573	250.61	.	.	. Q	.	V .
18.750	186.6329	243.30	.	.	. Q.	.	V .
18.833	188.2814	239.36	.	.	. Q.	.	V .
18.917	189.8792	232.00	.	.	. Q .	.	V .
19.000	191.4369	226.18	.	.	. Q .	.	V .
19.083	192.9497	219.66	.	.	. Q .	.	V .
19.167	194.4200	213.48	.	.	. Q .	.	V .
19.250	195.8627	209.47	.	.	. Q .	.	V .
19.333	197.2774	205.41	.	.	. Q .	.	V .
19.417	198.6671	201.79	.	.	. Q .	.	V .
19.500	200.0312	198.06	.	.	. Q .	.	V .
19.583	201.3556	192.31	.	.	. Q .	.	V .
19.667	202.6378	186.17	.	.	. Q .	.	V .
19.750	203.8992	183.17	.	.	. Q .	.	V .
19.833	205.1392	180.04	.	.	. Q .	.	V .
19.917	206.3526	176.19	.	.	. Q .	.	V .
20.000	207.5446	173.08	.	.	. Q .	.	V .

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

-----  
 FILE NAME: LU48002E.FLD  
 TIME/DATE OF STUDY: 13:18 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1048.00 IS CODE = 1

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 >>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<  
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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 7126.900 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.610 HOURS  
 VALLEY(DEVELOPED):  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.050  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.880  
 VALLEY(UNDEVELOPED)/DESERT:  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.680  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.93  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.44  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.64

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.731  
 30-MINUTE FACTOR = 0.731  
 1-HOUR FACTOR = 0.731  
 3-HOUR FACTOR = 0.956  
 6-HOUR FACTOR = 0.977  
 24-HOUR FACTOR = 0.985

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 5.176

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.552	475.563
2	1.654	950.383
3	2.745	940.175
4	4.192	1246.583
5	5.855	1433.627
6	7.587	1493.107
7	9.776	1886.945
8	12.356	2223.208
9	15.340	2571.963
10	18.936	3099.599
11	22.656	3206.393
12	27.208	3922.984
13	31.167	3412.861
14	34.484	2858.776
15	37.724	2792.923
16	40.356	2268.279
17	43.087	2353.640
18	45.567	2137.699
19	48.023	2117.176
20	50.327	1985.288
21	52.223	1634.108
22	53.893	1439.374
23	55.239	1160.055
24	56.772	1321.390
25	57.915	985.193
26	59.090	1012.789
27	60.225	978.335
28	61.335	957.131
29	62.424	938.140
30	63.447	881.956
31	64.353	781.211
32	65.254	776.147
33	66.095	725.270
34	66.904	696.501
35	67.719	703.030
36	68.475	651.548
37	69.226	646.767
38	69.916	594.989
39	70.588	578.944
40	71.248	569.633
41	71.900	561.518
42	72.551	560.861
43	73.194	554.725
44	73.769	495.142
45	74.299	456.771
46	74.822	451.425
47	75.336	442.949
48	75.818	415.304
49	76.289	405.947
50	76.763	408.294
51	77.229	401.455
52	77.676	385.463
53	78.105	369.937
54	78.534	369.319
55	78.960	367.721
56	79.380	362.040
57	79.759	326.550
58	80.127	316.936
59	80.492	314.529
60	80.855	312.905
61	81.216	311.360
62	81.565	300.543

63	81.902	290.501
64	82.238	290.251
65	82.576	290.527
66	82.912	290.218
67	83.247	288.384
68	83.541	253.321
69	83.810	232.167
70	84.079	231.720
71	84.348	231.976
72	84.617	231.759
73	84.886	231.720
74	85.155	232.002
75	85.401	212.321
76	85.625	192.409
77	85.847	191.410
78	86.069	191.403
79	86.292	191.988
80	86.511	189.503
81	86.727	185.544
82	86.942	185.643
83	87.156	184.794
84	87.353	169.624
85	87.545	165.047
86	87.735	164.028
87	87.924	163.022
88	88.113	163.015
89	88.302	163.002
90	88.492	162.982
91	88.680	162.752
92	88.870	163.285
93	89.057	161.279
94	89.230	149.015
95	89.400	146.937
96	89.570	146.720
97	89.740	146.359
98	89.911	146.720
99	90.081	146.609
100	90.247	143.104
101	90.414	144.314
102	90.582	144.314
103	90.748	143.715
104	90.914	142.558
105	91.065	130.609
106	91.214	128.255
107	91.363	128.295
108	91.511	127.670
109	91.660	128.328
110	91.808	127.650
111	91.957	128.282
112	92.106	128.295
113	92.254	128.288
114	92.403	127.670
115	92.551	127.729
116	92.700	128.860
117	92.837	117.938
118	92.962	107.653
119	93.085	106.167
120	93.206	103.800
121	93.327	104.839
122	93.448	104.372
123	93.569	104.339
124	93.690	104.300
125	93.811	103.833
126	93.933	104.872
127	94.054	104.372
128	94.175	104.346
129	94.295	103.760
130	94.417	104.944

131	94.538	104.293
132	94.645	92.358
133	94.738	80.337
134	94.833	81.402
135	94.926	80.324
136	95.020	80.824
137	95.113	80.337
138	95.207	81.442
139	95.301	80.909
140	95.395	80.824
141	95.488	80.331
142	95.581	80.298
143	95.676	81.481
144	95.770	80.830
145	95.863	80.324
146	95.957	80.870
147	96.051	80.863
148	96.144	80.298
149	96.238	81.442
150	96.331	80.291

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1027.2599  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 498.6432  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	200.0	400.0	600.0	800.0
14.000	144.9109	295.32	.	.V Q	.	.	.
14.083	146.9786	300.23	.	.V Q	.	.	.
14.167	149.0867	306.10	.	.V Q	.	.	.
14.250	151.2352	311.96	.	.V Q	.	.	.
14.333	153.4281	318.41	.	.V Q	.	.	.
14.417	155.6678	325.21	.	.V Q	.	.	.
14.500	157.9552	332.12	.	.V Q	.	.	.
14.583	160.2942	339.63	.	.V Q	.	.	.
14.667	162.6894	347.79	.	.V Q	.	.	.
14.750	165.1448	356.52	.	.V Q	.	.	.
14.833	167.6668	366.19	.	.V Q	.	.	.
14.917	170.2568	376.07	.	.V Q	.	.	.
15.000	172.9232	387.16	.	.V Q	.	.	.
15.083	175.6597	397.34	.	.V Q	.	.	.
15.167	178.4592	406.49	.	.V Q	.	.	.
15.250	181.3210	415.54	.	.V Q	.	.	.
15.333	184.2393	423.73	.	.V .Q	.	.	.
15.417	187.2050	430.63	.	.V .Q	.	.	.
15.500	190.2066	435.82	.	.V .Q	.	.	.
15.583	193.2462	441.35	.	.V .Q	.	.	.
15.667	196.3182	446.06	.	.V .Q	.	.	.
15.750	199.4102	448.95	.	.V .Q	.	.	.
15.833	202.5165	451.05	.	.V .Q	.	.	.
15.917	205.6369	453.07	.	.V .Q	.	.	.
16.000	208.7819	456.65	.	.V .Q	.	.	.
16.083	212.1836	493.94	.	.V .Q	.	.	.
16.167	215.8226	528.38	.	.V .Q	.	.	.
16.250	219.4523	527.03	.	.V .Q	.	.	.
16.333	223.2151	546.36	.	.V .Q	.	.	.
16.417	227.0652	559.03	.	.V .Q	.	.	.
16.500	230.9650	566.24	.	.V .Q	.	.	.
16.583	235.0857	598.33	.	.V .Q	.	.	.
16.667	239.4058	627.28	.	.V .Q	.	.	.
16.750	243.9397	658.33	.	.V .Q	.	.	.
16.833	248.7817	703.06	.	.V .Q	.	.	.
16.917	253.7173	716.65	.	.V .Q	.	.	.
17.000	259.0315	771.62	.	.V .Q	.	.	.
17.083	264.0850	733.77	.	.V .Q	.	.	.
17.167	268.8707	694.89	.	.V .Q	.	.	.
17.250	273.6304	691.10	.	.V .Q	.	.	.
17.333	278.1439	655.35	.	.V .Q	.	.	.
17.417	282.7192	664.34	.	.V .Q	.	.	.
17.500	287.1883	648.90	.	.V .Q	.	.	.
17.583	291.6433	646.87	.	.V .Q	.	.	.
17.667	295.9982	632.34	.	.V .Q	.	.	.
17.750	300.1427	601.78	.	.V .Q	.	.	.
17.833	304.1483	581.61	.	.V .Q	.	.	.
17.917	307.9768	555.89	.	.V .Q	.	.	.
18.000	311.8347	560.17	.	.V .Q	.	.	.
18.083	315.4682	527.58	.	.V Q	.	.	.
18.167	319.0666	522.49	.	.V Q	.	.	.
18.250	322.5913	511.78	.	.Q	.	.	.
18.333	326.0576	503.31	.	.QV	.	.	.
18.417	329.4555	493.37	.	.Q V	.	.	.
18.500	332.7690	481.12	.	.Q V	.	.	.
18.583	335.9734	465.27	.	.Q V	.	.	.

18.667	339.1157	456.26	.	.	.Q	V	.
18.750	342.1734	443.98	.	.	.Q	V	.
18.833	345.1560	433.08	.	.	.Q	V	.
18.917	348.0813	424.75	.	.	.Q	V	.
19.000	350.9128	411.13	.	.	.Q	V	.
19.083	353.6828	402.21	.	.	.Q	V	.
19.167	356.3723	390.52	.	.	.Q	V	.
19.250	359.0020	381.83	.	.	.Q	V	.
19.333	361.5810	374.48	.	.	.Q	V	.
19.417	364.1107	367.31	.	.	.Q	V	.
19.500	366.5957	360.82	.	.	.Q	V	.
19.583	369.0331	353.91	.	.	.Q	V	.
19.667	371.3978	343.36	.	.	.Q	V	.
19.750	373.7061	335.17	.	.	.Q	V	.
19.833	375.9769	329.72	.	.	.Q	V	.
19.917	378.2112	324.41	.	.	.Q	V	.
20.000	380.3985	317.60	.	.	.Q	V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 430 Exchange, Suite 200  
 Irvine, CA. 92602-1309  
 714 - 734 - 5100

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 FILE NAME: LU49002E.FLD  
 TIME/DATE OF STUDY: 13:18 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1049.00 IS CODE = 1

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 >>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<  
 =====

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 8128.900 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.660 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.050  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.870  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.070  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.680  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.92  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.43  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.61

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.705  
 30-MINUTE FACTOR = 0.705  
 1-HOUR FACTOR = 0.705  
 3-HOUR FACTOR = 0.951  
 6-HOUR FACTOR = 0.974  
 24-HOUR FACTOR = 0.983

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 5.020

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.534	524.716
2	1.601	1048.920
3	2.654	1035.258
4	4.006	1329.045
5	5.612	1579.209
6	7.253	1612.999
7	9.316	2028.591
8	11.716	2359.363
9	14.472	2708.748
10	17.790	3261.875
11	21.420	3568.567
12	25.477	3988.436
13	29.743	4194.161
14	33.067	3267.674
15	36.326	3204.534
16	39.048	2675.162
17	41.703	2610.340
18	44.241	2494.965
19	46.631	2349.552
20	49.014	2343.169
21	51.092	2042.359
22	52.854	1732.965
23	54.364	1484.050
24	55.750	1363.035
25	57.133	1359.079
26	58.244	1092.613
27	59.380	1116.445
28	60.488	1089.332
29	61.554	1048.218
30	62.623	1051.053
31	63.596	955.911
32	64.477	865.836
33	65.352	860.578
34	66.171	805.622
35	66.954	769.216
36	67.751	784.089
37	68.485	721.618
38	69.216	718.498
39	69.895	667.556
40	70.547	640.367
41	71.193	635.312
42	71.826	621.878
43	72.457	621.143
44	73.083	615.383
45	73.673	579.396
46	74.190	508.788
47	74.703	504.145
48	75.204	492.812
49	75.689	476.611
50	76.145	447.787
51	76.606	453.630
52	77.061	446.767
53	77.508	440.332
54	77.930	414.748
55	78.347	409.175
56	78.761	407.488
57	79.174	405.733
58	79.573	392.142
59	79.933	353.995
60	80.289	350.200
61	80.642	347.102
62	80.993	344.815

63	81.342	343.787
64	81.678	329.746
65	82.004	320.723
66	82.330	320.791
67	82.657	321.083
68	82.983	320.716
69	83.308	319.133
70	83.597	283.942
71	83.857	256.228
72	84.118	255.988
73	84.378	256.265
74	84.639	255.980
75	84.899	255.973
76	85.160	256.618
77	85.410	245.285
78	85.629	215.066
79	85.844	211.421
80	86.059	211.421
81	86.274	211.788
82	86.489	211.053
83	86.699	206.575
84	86.907	204.775
85	87.116	205.038
86	87.318	198.760
87	87.504	182.754
88	87.690	182.664
89	87.873	180.354
90	88.056	179.799
91	88.239	179.829
92	88.422	179.806
93	88.604	179.446
94	88.788	180.226
95	88.971	179.776
96	89.150	176.836
97	89.317	163.501
98	89.482	162.143
99	89.647	162.211
100	89.811	161.836
101	89.976	162.173
102	90.140	161.431
103	90.301	157.740
104	90.463	159.068
105	90.624	159.045
106	90.786	158.408
107	90.947	158.355
108	91.096	146.475
109	91.238	140.347
110	91.383	141.772
111	91.525	140.437
112	91.669	141.112
113	91.813	141.727
114	91.957	141.142
115	92.100	140.384
116	92.244	141.742
117	92.387	141.097
118	92.531	141.097
119	92.674	141.022
120	92.816	139.822
121	92.941	122.459
122	93.062	118.971
123	93.179	115.378
124	93.296	114.178
125	93.412	114.958
126	93.529	114.906
127	93.646	114.291
128	93.763	114.913
129	93.879	114.898
130	93.996	114.246

131	94.112	114.291
132	94.229	114.906
133	94.345	114.238
134	94.462	114.966
135	94.579	114.906
136	94.683	102.253
137	94.774	89.674
138	94.864	88.227
139	94.954	89.059
140	95.045	88.894
141	95.135	89.007
142	95.226	88.947
143	95.316	88.294
144	95.405	88.324
145	95.497	89.614
146	95.586	88.294
147	95.677	88.999
148	95.767	88.947
149	95.858	88.947
150	95.948	88.962

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1157.7218  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 557.1355  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	225.0	450.0	675.0	900.0
14.000	161.2291	332.06	.	.V	Q	.	.
14.083	163.5565	337.94	.	.V	Q	.	.
14.167	165.9288	344.46	.	.V	Q	.	.
14.250	168.3467	351.07	.	.V	Q	.	.
14.333	170.8137	358.22	.	.V	Q	.	.
14.417	173.3334	365.85	.	.V	Q	.	.
14.500	175.9062	373.58	.	.V	Q	.	.
14.583	178.5371	382.00	.	.V	Q	.	.
14.667	181.2294	390.92	.	.V	Q	.	.
14.750	183.9879	400.53	.	.V	Q	.	.
14.833	186.8188	411.06	.	.V	Q	.	.
14.917	189.7260	422.12	.	.V	Q	.	.
15.000	192.7145	433.93	.	.V	Q	.	.
15.083	195.7864	446.04	.	.V	Q	.	.
15.167	198.9299	456.42	.	.V	Q	.	.
15.250	202.1438	466.66	.	.V	Q	.	.
15.333	205.4215	475.92	.	.V	.Q	.	.
15.417	208.7511	483.45	.	.V	.Q	.	.
15.500	212.1203	489.21	.	.V	.Q	.	.
15.583	215.5303	495.13	.	.V	.Q	.	.
15.667	218.9774	500.52	.	.V	.Q	.	.
15.750	222.4481	503.94	.	.V	.Q	.	.
15.833	225.9347	506.25	.	.V	.Q	.	.
15.917	229.4373	508.59	.	.V	.Q	.	.
16.000	232.9646	512.16	.	.V	.Q	.	.
16.083	236.7612	551.25	.	.V	.Q	.	.
16.167	240.8016	586.67	.	.V	.Q	.	.
16.250	244.8256	584.29	.	.V	.Q	.	.
16.333	248.9695	601.68	.	.V	.Q	.	.
16.417	253.2117	615.98	.	.V	.Q	.	.
16.500	257.4860	620.63	.	.V	.Q	.	.
16.583	261.9754	651.86	.	.V	.Q	.	.
16.667	266.6505	678.83	.	.V	.Q	.	.
16.750	271.5280	708.20	.	.V	.Q	.	.
16.833	276.7111	752.59	.	.V	.Q	.	.
16.917	282.0838	780.12	.	.V	.Q	.	.
17.000	287.6864	813.50	.	.V	.Q	.	.
17.083	293.3849	827.43	.	.V	.Q	.	.
17.167	298.6497	764.45	.	.V	.Q	.	.
17.250	303.8993	762.24	.	.V	.Q	.	.
17.333	308.9142	728.17	.	.V	.Q	.	.
17.417	313.9249	727.55	.	.V	.Q	.	.
17.500	318.8912	721.11	.	.V	.Q	.	.
17.583	323.7934	711.79	.	.V	.Q	.	.
17.667	328.6724	708.43	.	.V	.Q	.	.
17.750	333.3752	682.84	.	.V	.Q	.	.
17.833	337.8916	655.79	.	.V	.Q	.	.
17.917	342.2476	632.48	.	.V	.Q	.	.
18.000	346.5013	617.64	.	.V	.Q	.	.
18.083	350.6910	608.35	.	.V	.Q	.	.
18.167	354.6969	581.66	.	.Q	.	.	.
18.250	358.6577	575.11	.	.Q	.	.	.
18.333	362.5486	564.96	.	.QV	.	.	.
18.417	366.3633	553.89	.	.QV	.	.	.
18.500	370.1155	544.81	.	.QV	.	.	.
18.583	373.7574	528.80	.	.QV	.	.	.

18.667	377.2901	512.94	.	.	.Q	V	.
18.750	380.7535	502.89	.	.	.Q	V	.
18.833	384.1232	489.28	.	.	.Q	V	.
18.917	387.4078	476.92	.	.	.Q	V	.
19.000	390.6267	467.38	.	.	.Q	V	.
19.083	393.7423	452.38	.	.	.Q	V	.
19.167	396.7958	443.37	.	.	.Q	V	.
19.250	399.7642	431.01	.	.	.Q	V	.
19.333	402.6661	421.36	.	.	.Q	V	.
19.417	405.5130	413.37	.	.	.Q	V	.
19.500	408.3040	405.25	.	.	.Q	V	.
19.583	411.0464	398.19	.	.	.Q	V	.
19.667	413.7372	390.71	.	.	.Q	V	.
19.750	416.3649	381.53	.	.	.Q	V	.
19.833	418.9185	370.78	.	.	.Q	V	.
19.917	421.4329	365.09	.	.	.Q	V	.
20.000	423.9055	359.04	.	.	.Q	V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 FILE NAME: LU50002E.FLD  
 TIME/DATE OF STUDY: 13:19 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1050.00 IS CODE = 1

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 >>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<<  
 =====

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 9515.800 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.670 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.050  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.870  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.070  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.690  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.45  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.92  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.42  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.60

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.680  
 30-MINUTE FACTOR = 0.684  
 1-HOUR FACTOR = 0.685  
 3-HOUR FACTOR = 0.944  
 6-HOUR FACTOR = 0.971  
 24-HOUR FACTOR = 0.982

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 4.990

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.531	610.561
2	1.591	1220.587
3	2.638	1204.702
4	3.972	1534.943
5	5.568	1837.151
6	7.194	1871.598
7	9.237	2350.470
8	11.597	2715.938
9	14.314	3126.727
10	17.581	3760.151
11	21.208	4173.406
12	25.151	4538.270
13	29.453	4950.705
14	32.823	3877.842
15	36.040	3702.278
16	38.826	3206.707
17	41.435	3001.772
18	43.989	2939.982
19	46.363	2731.461
20	48.741	2736.882
21	50.862	2440.670
22	52.639	2045.147
23	54.195	1790.034
24	55.521	1526.339
25	56.968	1665.432
26	58.067	1264.681
27	59.204	1308.142
28	60.304	1265.932
29	61.380	1238.964
30	62.428	1205.842
31	63.436	1160.062
32	64.309	1005.029
33	65.182	1004.542
34	66.015	957.735
35	66.789	891.683
36	67.589	919.709
37	68.325	847.607
38	69.053	838.055
39	69.745	796.481
40	70.391	743.186
41	71.039	745.882
42	71.668	723.879
43	72.297	722.966
44	72.921	718.988
45	73.526	695.300
46	74.050	603.592
47	74.561	588.412
48	75.062	576.559
49	75.553	564.565
50	76.010	525.696
51	76.466	525.520
52	76.921	523.229
53	77.370	516.249
54	77.797	491.902
55	78.211	476.282
56	78.624	474.939
57	79.034	472.682
58	79.440	467.282
59	79.808	422.952
60	80.162	408.061
61	80.515	405.207
62	80.864	401.687

63	81.212	400.747
64	81.553	392.433
65	81.878	374.152
66	82.203	373.696
67	82.527	373.371
68	82.851	372.932
69	83.176	373.547
70	83.484	354.362
71	83.747	303.227
72	84.006	298.302
73	84.265	297.994
74	84.524	297.977
75	84.783	297.933
76	85.042	298.003
77	85.300	296.353
78	85.528	263.103
79	85.743	246.579
80	85.956	245.964
81	86.170	246.342
82	86.384	245.964
83	86.596	243.980
84	86.803	237.921
85	87.010	238.984
86	87.217	237.368
87	87.408	220.168
88	87.592	212.284
89	87.776	211.300
90	87.958	208.886
91	88.140	209.650
92	88.322	209.246
93	88.503	209.272
94	88.685	208.842
95	88.867	209.632
96	89.049	209.184
97	89.221	198.411
98	89.386	189.183
99	89.549	188.060
100	89.713	188.946
101	89.877	188.007
102	90.041	189.631
103	90.202	185.338
104	90.362	183.248
105	90.523	185.601
106	90.683	184.135
107	90.843	184.714
108	91.001	181.036
109	91.145	166.022
110	91.288	164.476
111	91.430	163.651
112	91.573	164.485
113	91.715	163.756
114	91.859	165.188
115	92.001	162.940
116	92.143	164.450
117	92.286	164.494
118	92.429	164.441
119	92.572	164.468
120	92.714	163.774
121	92.852	158.155
122	92.974	140.200
123	93.093	137.741
124	93.209	133.553
125	93.326	133.650
126	93.442	133.711
127	93.557	132.851
128	93.673	132.930
129	93.789	133.711
130	93.904	132.912

131	94.020	132.868
132	94.136	133.711
133	94.252	133.702
134	94.368	132.930
135	94.483	132.860
136	94.599	133.702
137	94.699	114.123
138	94.789	103.921
139	94.878	103.078
140	94.968	103.139
141	95.058	103.139
142	95.147	103.139
143	95.238	103.868
144	95.327	103.139
145	95.417	103.139
146	95.507	103.929
147	95.596	102.349
148	95.686	103.868
149	95.776	103.139
150	95.865	103.078

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1369.1344  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 627.2909  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	250.0	500.0	750.0	1000.0
14.000	182.0962	371.57	.	.V	Q	.	.
14.083	184.7023	378.41	.	.V	Q	.	.
14.167	187.3610	386.04	.	.V	Q	.	.
14.250	190.0729	393.77	.	.V	Q	.	.
14.333	192.8426	402.16	.	.V	Q	.	.
14.417	195.6748	411.23	.	.V	Q	.	.
14.500	198.5696	420.33	.	.V	Q	.	.
14.583	201.5339	430.42	.	.V	Q	.	.
14.667	204.5714	441.05	.	.V	Q	.	.
14.750	207.6883	452.57	.	.V	Q	.	.
14.833	210.8926	465.27	.	.V	Q	.	.
14.917	214.1897	478.73	.	.V	Q	.	.
15.000	217.5841	492.87	.	.V	Q	.	.
15.083	221.0808	507.72	.	.V	Q	.	.
15.167	224.6635	520.22	.	.V	Q	.	.
15.250	228.3293	532.27	.	.V	Q	.	.
15.333	232.0701	543.17	.	.V	Q	.	.
15.417	235.8685	551.53	.	.V	Q	.	.
15.500	239.7094	557.69	.	.V	Q	.	.
15.583	243.5926	563.84	.	.V	Q	.	.
15.667	247.5131	569.27	.	.V	Q	.	.
15.750	251.4562	572.54	.	.V	Q	.	.
15.833	255.4132	574.55	.	.V	Q	.	.
15.917	259.3823	576.31	.	.V	Q	.	.
16.000	263.3706	579.11	.	.V	Q	.	.
16.083	267.6472	620.96	.	.V	Q	.	.
16.167	272.1803	658.20	.	.V	Q	.	.
16.250	276.6825	653.71	.	.V	Q	.	.
16.333	281.2990	670.32	.	.V	Q	.	.
16.417	286.0152	684.80	.	.V	Q	.	.
16.500	290.7574	688.56	.	.V	Q	.	.
16.583	295.7298	721.99	.	.V	Q	.	.
16.667	300.8964	750.18	.	.V	Q	.	.
16.750	306.2895	783.08	.	.V	Q	.	.
16.833	312.0118	830.88	.	.V	Q	.	.
16.917	317.9687	864.94	.	.V	Q	.	.
17.000	324.1250	893.90	.	.V	Q	.	.
17.083	330.4659	920.70	.	.V	Q	.	.
17.167	336.3339	852.03	.	.V	Q	.	.
17.250	342.1453	843.81	.	.V	Q	.	.
17.333	347.7611	815.42	.	.V	Q	.	.
17.417	353.3226	807.54	.	.V	Q	.	.
17.500	358.8786	806.72	.	.V	Q	.	.
17.583	364.3522	794.78	.	.V	Q	.	.
17.667	369.8150	793.20	.	.V	Q	.	.
17.750	375.1103	768.87	.	.V	Q	.	.
17.833	380.1866	737.09	.	.V	Q	.	.
17.917	385.0989	713.26	.	.V	Q	.	.
18.000	389.8457	689.24	.	.V	Q	.	.
18.083	394.5836	687.94	.	.V	Q	.	.
18.167	399.0761	652.31	.	.V	Q	.	.
18.250	403.5252	646.00	.	.V	Q	.	.
18.333	407.8881	633.48	.	.V	Q	.	.
18.417	412.1772	622.78	.	.V	Q	.	.
18.500	416.3786	610.04	.	.V	Q	.	.
18.583	420.4850	596.26	.	.V	Q	.	.

18.667	424.4461	575.16	.	.	.Q	V	.
18.750	428.3316	564.17	.	.	.Q	V	.
18.833	432.1199	550.06	.	.	.Q	V	.
18.917	435.8031	534.80	.	.	.Q	V	.
19.000	439.4196	525.12	.	.	.Q	V	.
19.083	442.9198	508.23	.	.	.Q	V	.
19.167	446.3487	497.87	.	.	.Q	V	.
19.250	449.6915	485.37	.	.	.Q	V	.
19.333	452.9504	473.20	.	.	.Q	V	.
19.417	456.1519	464.86	.	.	.Q	V	.
19.500	459.2882	455.39	.	.	.Q	V	.
19.583	462.3706	447.57	.	.	.Q	V	.
19.667	465.3974	439.49	.	.	.Q	V	.
19.750	468.3616	430.40	.	.	.Q	V	.
19.833	471.2388	417.77	.	.	.Q	V	.
19.917	474.0676	410.73	.	.	.Q	V	.
20.000	476.8512	404.19	.	.	.Q	V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

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430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

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FILE NAME: LU51002E.FLD  
TIME/DATE OF STUDY: 13:20 02/25/2004

\*\*\*\*\*

FLOW PROCESS FROM NODE 1000.00 TO NODE 1051.00 IS CODE = 1

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>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 9976.100 ACRES  
BASEFLOW = 0.000 CFS/SQUARE-MILE  
\*USER ENTERED "LAG" TIME = 1.730 HOURS  
VALLEY(DEVELOPED):  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.050  
MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.870  
VALLEY(UNDEVELOPED)/DESERT:  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.070  
DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
LOW LOSS FRACTION = 0.690  
\*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.45  
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.92  
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.42  
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.59

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
5-MINUTE FACTOR = 0.672  
30-MINUTE FACTOR = 0.677  
1-HOUR FACTOR = 0.680  
3-HOUR FACTOR = 0.941  
6-HOUR FACTOR = 0.970  
24-HOUR FACTOR = 0.981

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 4.817

RUNOFF HYDROGRAPH LISTING LIMITS:  
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.512	617.896
2	1.536	1235.548
3	2.547	1220.049
4	3.780	1486.717
5	5.317	1854.205
6	6.876	1881.720
7	8.759	2271.950
8	10.929	2617.004
9	13.446	3037.837
10	16.434	3603.926
11	19.939	4229.354
12	23.404	4180.172
13	27.738	5229.433
14	31.311	4310.341
15	34.384	3708.112
16	37.449	3696.898
17	39.893	2949.689
18	42.476	3116.318
19	44.844	2855.851
20	47.140	2771.071
21	49.405	2732.438
22	51.334	2327.227
23	53.002	2012.153
24	54.428	1720.583
25	55.765	1612.713
26	57.099	1609.699
27	58.160	1280.818
28	59.255	1320.518
29	60.316	1280.454
30	61.357	1255.426
31	62.365	1215.768
32	63.354	1193.943
33	64.197	1017.203
34	65.043	1020.724
35	65.857	982.156
36	66.610	908.223
37	67.379	927.949
38	68.106	876.439
39	68.810	849.276
40	69.499	831.318
41	70.130	761.859
42	70.757	755.839
43	71.370	740.485
44	71.977	731.814
45	72.583	731.290
46	73.182	722.821
47	73.736	668.016
48	74.231	596.909
49	74.722	593.007
50	75.203	579.908
51	75.669	562.824
52	76.106	527.229
53	76.549	533.931
54	76.986	527.496
55	77.418	521.375
56	77.828	494.543
57	78.227	481.776
58	78.626	480.994
59	79.023	478.306
60	79.415	473.787
61	79.773	431.703
62	80.115	412.759

63	80.456	411.121
64	80.793	406.620
65	81.130	406.454
66	81.462	400.830
67	81.779	382.043
68	82.092	377.754
69	82.405	377.864
70	82.718	377.763
71	83.031	377.781
72	83.342	374.817
73	83.614	327.892
74	83.864	302.164
75	84.114	301.520
76	84.364	301.492
77	84.614	301.557
78	84.864	301.962
79	85.114	301.078
80	85.359	296.006
81	85.573	257.954
82	85.780	249.191
83	85.986	249.154
84	86.193	249.145
85	86.399	249.145
86	86.603	246.089
87	86.803	241.348
88	87.003	240.851
89	87.203	241.302
90	87.389	224.228
91	87.567	215.363
92	87.745	214.268
93	87.920	211.479
94	88.095	211.829
95	88.271	211.774
96	88.447	211.801
97	88.622	211.783
98	88.798	211.829
99	88.973	211.405
100	89.146	208.349
101	89.306	193.484
102	89.464	190.474
103	89.622	190.980
104	89.781	191.394
105	89.938	189.664
106	90.097	191.578
107	90.251	186.092
108	90.407	188.127
109	90.561	185.641
110	90.716	187.188
111	90.871	187.409
112	91.021	180.431
113	91.160	167.720
114	91.297	165.280
115	91.435	166.762
116	91.573	166.081
117	91.711	166.790
118	91.848	165.234
119	91.986	166.928
120	92.124	165.971
121	92.261	165.998
122	92.399	165.971
123	92.537	166.081
124	92.675	166.910
125	92.811	164.332
126	92.932	145.463
127	93.047	139.572
128	93.161	137.142
129	93.273	134.785
130	93.384	134.573

131	93.497	135.494
132	93.608	134.583
133	93.720	134.647
134	93.831	134.573
135	93.944	135.494
136	94.055	134.647
137	94.167	134.647
138	94.279	135.420
139	94.391	134.647
140	94.502	134.583
141	94.614	134.638
142	94.708	113.375
143	94.793	103.066
144	94.881	105.643
145	94.967	104.069
146	95.053	103.940
147	95.140	104.860
148	95.227	104.778
149	95.314	104.916
150	95.400	103.866

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1429.7355  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 650.9187  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	250.0	500.0	750.0	1000.0
14.000	187.2638	384.55	.	.V	Q	.	.
14.083	189.9599	391.47	.	.V	Q	.	.
14.167	192.7128	399.73	.	.V	Q	.	.
14.250	195.5200	407.60	.	.V	Q	.	.
14.333	198.3858	416.11	.	.V	Q	.	.
14.417	201.3156	425.41	.	.V	Q	.	.
14.500	204.3098	434.75	.	.V	Q	.	.
14.583	207.3739	444.91	.	.V	Q	.	.
14.667	210.5127	455.76	.	.V	Q	.	.
14.750	213.7308	467.26	.	.V	Q	.	.
14.833	217.0360	479.92	.	.V	Q	.	.
14.917	220.4369	493.80	.	.V	Q	.	.
15.000	223.9313	507.40	.	.V	Q	.	.
15.083	227.5341	523.12	.	.V	Q	.	.
15.167	231.2308	536.77	.	.V	.Q	.	.
15.250	235.0120	549.03	.	.V	.Q	.	.
15.333	238.8772	561.22	.	.V	.Q	.	.
15.417	242.7997	569.56	.	.V	.Q	.	.
15.500	246.7679	576.17	.	.V	.Q	.	.
15.583	250.7805	582.63	.	.V	.Q	.	.
15.667	254.8328	588.40	.	.V	.Q	.	.
15.750	258.9120	592.30	.	.V	.Q	.	.
15.833	263.0102	595.05	.	.V	.Q	.	.
15.917	267.1262	597.65	.	.V	.Q	.	.
16.000	271.2675	601.31	.	.V	.Q	.	.
16.083	275.6956	642.96	.	.V	.Q	.	.
16.167	280.3855	680.98	.	.V	.Q	.	.
16.250	285.0421	676.13	.	.V	.Q	.	.
16.333	289.7922	689.72	.	.V	.Q	.	.
16.417	294.6611	706.97	.	.V	.Q	.	.
16.500	299.5406	708.49	.	.V	.Q	.	.
16.583	304.6061	735.52	.	.V	.Q	.	.
16.667	309.8473	761.02	.	.V	.Q	.	.
16.750	315.3162	794.08	.	.V	.Q	.	.
16.833	321.0754	836.24	.	.V	.Q	.	.
16.917	327.1578	883.16	.	.V	.Q	.	.
17.000	333.2672	887.10	.	.V	.Q	.	.
17.083	339.8439	954.93	.	.V	.Q	.	.
17.167	346.0127	895.71	.	.V	.Q	.	.
17.250	351.9438	861.19	.	.V	.Q	.	.
17.333	357.8824	862.29	.	.V	.Q	.	.
17.417	363.5360	820.91	.	.V	.Q	.	.
17.500	369.2891	835.35	.	.V	.Q	.	.
17.583	374.9402	820.54	.	.V	.Q	.	.
17.667	380.5615	816.21	.	.V	.Q	.	.
17.750	386.1367	809.52	.	.V	.Q	.	.
17.833	391.4959	778.16	.	.V	.Q	.	.
17.917	396.6681	750.99	.	.V	.Q	.	.
18.000	401.6644	725.47	.	.V	.Q	.	.
18.083	406.5489	709.22	.	.V	.Q	.	.
18.167	411.3603	698.62	.	.V	.Q	.	.
18.250	415.9638	668.42	.	.V	.Q	.	.
18.333	420.5157	660.95	.	.V	.Q	.	.
18.417	424.9850	648.93	.	.V	.Q	.	.
18.500	429.3771	637.74	.	.V	.Q	.	.
18.583	433.6768	624.31	.	.V	.Q	.	.

18.667	437.8884	611.52	.	.	.	.Q	V	.	.
18.750	441.9427	588.68	.	.	.	.	.Q	V	.
18.833	445.9196	577.45	.	.	.	.	.Q	V	.
18.917	449.7982	563.17	.	.	.	.	.Q	V	.
19.000	453.5696	547.61	.	.	.	.	.Q	V	.
19.083	457.2624	536.20	.	.	.	.	.Q	V	.
19.167	460.8539	521.49	.	.	.	.	.Q	V	.
19.250	464.3662	509.98	.	.	.	.	.Q	V	.
19.333	467.8024	498.93	.	.	.	.	.Q	V	.
19.417	471.1493	485.97	.	.	.	.	.Q	V	.
19.500	474.4336	476.87	.	.	.	.	.Q	V	.
19.583	477.6544	467.67	.	.	.	.	.Q	V	.
19.667	480.8176	459.30	.	.	.	.	.Q	V	.
19.750	483.9271	451.51	.	.	.	.	.Q	V	.
19.833	486.9818	443.54	.	.	.	.	.Q	V	.
19.917	489.9647	433.11	.	.	.	.	.Q	V	.
20.000	492.8750	422.57	.	.	.	.	.Q	V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 430 Exchange, Suite 200  
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 714 - 734 - 5100

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 FILE NAME: LU52002E.FLD  
 TIME/DATE OF STUDY: 13:20 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1052.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 10727.700 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.840 HOURS  
 VALLEY(DEVELOPED):  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.050  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.870  
 VALLEY(UNDEVELOPED)/DESERT:  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.070  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.690  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.45  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.91  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.40  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.56

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.659  
 30-MINUTE FACTOR = 0.667  
 1-HOUR FACTOR = 0.670  
 3-HOUR FACTOR = 0.937  
 6-HOUR FACTOR = 0.968  
 24-HOUR FACTOR = 0.980

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 4.529

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.482	624.726
2	1.445	1249.449
3	2.397	1235.731
4	3.474	1397.699
5	4.903	1853.240
6	6.364	1896.130
7	7.940	2044.833
8	9.891	2529.946
9	12.163	2947.763
10	14.690	3279.532
11	17.681	3879.480
12	21.002	4309.280
13	24.437	4456.420
14	28.511	5284.877
15	31.740	4189.481
16	34.617	3732.587
17	37.494	3732.619
18	39.774	2958.443
19	42.213	3164.346
20	44.465	2922.087
21	46.618	2792.455
22	48.773	2795.974
23	50.715	2519.204
24	52.352	2124.646
25	53.829	1915.204
26	54.999	1518.854
27	56.394	1808.902
28	57.463	1387.668
29	58.490	1332.456
30	59.506	1317.905
31	60.506	1297.579
32	61.471	1252.126
33	62.425	1236.893
34	63.353	1204.363
35	64.144	1026.328
36	64.941	1034.553
37	65.715	1003.443
38	66.430	927.385
39	67.145	928.009
40	67.851	916.111
41	68.514	859.483
42	69.174	856.603
43	69.793	803.301
44	70.379	760.006
45	70.969	765.559
46	71.540	741.407
47	72.111	739.883
48	72.680	738.596
49	73.242	729.658
50	73.757	667.151
51	74.221	602.832
52	74.684	600.635
53	75.137	586.995
54	75.580	575.553
55	75.994	536.623
56	76.407	536.197
57	76.822	538.563
58	77.230	528.942
59	77.628	516.965
60	78.005	488.705
61	78.380	486.953
62	78.755	485.340

63	79.127	483.162
64	79.493	474.274
65	79.822	428.000
66	80.144	417.597
67	80.464	415.360
68	80.781	411.004
69	81.098	411.093
70	81.412	406.600
71	81.712	389.644
72	82.006	381.923
73	82.301	381.884
74	82.595	381.933
75	82.889	381.884
76	83.184	381.725
77	83.466	365.829
78	83.706	311.705
79	83.941	305.113
80	84.176	305.064
81	84.411	305.093
82	84.646	304.608
83	84.881	305.103
84	85.116	304.579
85	85.348	300.738
86	85.550	262.541
87	85.744	251.633
88	85.938	252.068
89	86.133	251.989
90	86.327	252.009
91	86.520	250.643
92	86.709	245.644
93	86.897	243.635
94	87.085	243.586
95	87.271	241.170
96	87.441	220.206
97	87.608	217.791
98	87.775	215.663
99	87.940	214.267
100	88.105	214.109
101	88.270	213.643
102	88.435	214.712
103	88.600	213.653
104	88.765	214.109
105	88.930	214.693
106	89.094	212.703
107	89.248	199.509
108	89.397	192.837
109	89.545	193.134
110	89.694	192.837
111	89.843	192.699
112	89.992	194.184
113	90.139	190.373
114	90.284	188.551
115	90.431	189.818
116	90.576	188.502
117	90.721	188.759
118	90.868	189.521
119	91.009	183.761
120	91.140	170.121
121	91.269	167.221
122	91.399	168.240
123	91.528	168.181
124	91.658	168.181
125	91.787	167.211
126	91.917	168.181
127	92.047	169.171
128	92.176	167.211
129	92.305	167.270
130	92.435	169.151

131	92.565	168.181
132	92.694	167.211
133	92.822	166.221
134	92.934	145.821
135	93.043	140.941
136	93.150	138.714
137	93.255	136.823
138	93.360	135.942
139	93.465	136.665
140	93.570	135.853
141	93.676	136.843
142	93.780	135.863
143	93.885	135.853
144	93.991	137.714
145	94.095	134.893
146	94.201	137.724
147	94.305	134.883
148	94.411	137.803
149	94.515	134.883
150	94.620	135.774

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1519.3187  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 684.5955  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	250.0	500.0	750.0	1000.0
14.000	195.2344	398.31	.	.V	Q	.	.
14.083	198.0281	405.64	.	.V	Q	.	.
14.167	200.8780	413.81	.	.V	Q	.	.
14.250	203.7871	422.40	.	.V	Q	.	.
14.333	206.7543	430.83	.	.V	Q	.	.
14.417	209.7858	440.18	.	.V	Q	.	.
14.500	212.8825	449.64	.	.V	Q	.	.
14.583	216.0465	459.42	.	.V	Q	.	.
14.667	219.2846	470.17	.	.V	Q	.	.
14.750	222.6026	481.77	.	.V	Q	.	.
14.833	226.0049	494.01	.	.V	Q	.	.
14.917	229.4982	507.23	.	.V	Q	.	.
15.000	233.0883	521.29	.	.V	Q	.	.
15.083	236.7766	535.54	.	.V	.Q	.	.
15.167	240.5735	551.31	.	.V	.Q	.	.
15.250	244.4630	564.75	.	.V	.Q	.	.
15.333	248.4379	577.16	.	.V	.Q	.	.
15.417	252.4830	587.36	.	.V	.Q	.	.
15.500	256.5732	593.88	.	.V	.Q	.	.
15.583	260.7135	601.18	.	.V	.Q	.	.
15.667	264.8993	607.78	.	.V	.Q	.	.
15.750	269.1147	612.07	.	.V	.Q	.	.
15.833	273.3568	615.95	.	.V	.Q	.	.
15.917	277.6314	620.68	.	.V	.Q	.	.
16.000	281.9427	626.00	.	.V	.Q	.	.
16.083	286.5430	667.96	.	.V	.Q	.	.
16.167	291.4058	706.08	.	.V	.Q	.	.
16.250	296.2536	703.90	.	.V	.Q	.	.
16.333	301.1473	710.57	.	.V	.Q	.	.
16.417	306.2108	735.22	.	.V	.Q	.	.
16.500	311.2667	734.11	.	.V	.Q	.	.
16.583	316.3941	744.50	.	.V	.Q	.	.
16.667	321.7487	777.50	.	.V	.Q	.	.
16.750	327.3107	807.59	.	.V	.Q	.	.
16.833	333.0576	834.46	.	.V	.Q	.	.
16.917	339.1011	877.51	.	.V	.Q	.	.
17.000	345.3782	911.44	.	.V	.Q	.	.
17.083	351.7572	926.23	.	.V	.Q	.	.
17.167	358.4803	976.19	.	.V	.Q	.	.
17.250	364.7379	908.60	.	.V	.Q	.	.
17.333	370.8251	883.87	.	.V	.Q	.	.
17.417	376.9203	885.02	.	.V	.Q	.	.
17.500	382.7347	844.25	.	.V	.Q	.	.
17.583	388.6519	859.19	.	.V	.Q	.	.
17.667	394.4718	845.04	.	.V	.Q	.	.
17.750	400.2411	837.72	.	.V	.Q	.	.
17.833	405.9841	833.87	.	.V	.Q	.	.
17.917	411.5662	810.52	.	.V	.Q	.	.
18.000	416.9300	778.82	.	.V	.Q	.	.
18.083	422.1450	757.21	.	.V	.Q	.	.
18.167	427.1219	722.65	.	.V	.Q	.	.
18.250	432.1563	731.00	.	.V	.Q	.	.
18.333	436.9444	695.22	.	.V	.Q	.	.
18.417	441.6400	681.81	.	.V	.Q	.	.
18.500	446.2609	670.94	.	.V	.Q	.	.
18.583	450.8084	660.31	.	.V	.Q	.	.

18.667	455.2617	646.62	.	.	.	.QV	.
18.750	459.6295	634.19	.	.	.	.QV	.
18.833	463.8985	619.87	.	.	.	.QV	.
18.917	468.0089	596.83	.	.	.	.QV	.
19.000	472.0413	585.51	.	.	.	.QV	.
19.083	475.9796	571.85	.	.	.	.QV	.
19.167	479.8049	555.42	.	.	.	.QV	.
19.250	483.5521	544.09	.	.	.	.QV	.
19.333	487.2256	533.40	.	.	.	.QV	.
19.417	490.8072	520.04	.	.	.	.QV	.
19.500	494.3263	510.97	.	.	.	.QV	.
19.583	497.7619	498.85	.	.	.	.QV	.
19.667	501.1225	487.96	.	.	.	.QV	.
19.750	504.4294	480.16	.	.	.	.QV	.
19.833	507.6719	470.81	.	.	.	.QV	.
19.917	510.8651	463.66	.	.	.	.QV	.
20.000	514.0106	456.72	.	.	.	.QV	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

-----  
 FILE NAME: LU53002E.FLD  
 TIME/DATE OF STUDY: 13:20 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1053.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 12821.300 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 1.890 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.860  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.070  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.680  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.45  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.91  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.40  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.55

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.624  
 30-MINUTE FACTOR = 0.638  
 1-HOUR FACTOR = 0.644  
 3-HOUR FACTOR = 0.927  
 6-HOUR FACTOR = 0.964  
 24-HOUR FACTOR = 0.978

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 4.409

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.467	723.741
2	1.400	1447.482
3	2.324	1433.086
4	3.339	1572.683
5	4.711	2127.037
6	6.123	2189.609
7	7.595	2283.003
8	9.461	2892.695
9	11.586	3295.352
10	13.924	3626.245
11	16.706	4313.314
12	19.934	5004.308
13	23.040	4817.211
14	27.003	6144.562
15	30.424	5303.875
16	33.241	4369.125
17	36.128	4475.598
18	38.562	3773.821
19	40.862	3566.661
20	43.193	3614.288
21	45.334	3320.266
22	47.507	3369.485
23	49.608	3256.970
24	51.366	2725.746
25	52.914	2400.582
26	54.286	2127.523
27	55.437	1784.496
28	56.796	2108.299
29	57.779	1523.988
30	58.794	1573.153
31	59.779	1528.253
32	60.762	1523.485
33	61.692	1442.154
34	62.636	1463.028
35	63.523	1375.741
36	64.296	1199.516
37	65.077	1209.708
38	65.833	1173.177
39	66.533	1084.547
40	67.230	1081.577
41	67.923	1074.326
42	68.569	1002.423
43	69.214	999.750
44	69.829	953.057
45	70.402	888.548
46	70.980	897.066
47	71.541	868.851
48	72.096	861.635
49	72.652	861.256
50	73.202	853.685
51	73.730	817.533
52	74.189	712.755
53	74.643	702.818
54	75.088	690.361
55	75.527	681.062
56	75.942	643.514
57	76.342	619.890
58	76.749	630.466
59	77.148	619.854
60	77.545	614.744
61	77.922	584.435
62	78.288	567.306



63	78.653	566.738
64	79.017	564.230
65	79.379	561.887
66	79.727	539.588
67	80.043	489.642
68	80.356	485.821
69	80.667	482.390
70	80.976	477.930
71	81.284	478.285
72	81.588	471.578
73	81.878	449.160
74	82.165	444.392
75	82.450	442.618
76	82.737	444.487
77	83.022	442.570
78	83.308	443.753
79	83.585	428.469
80	83.820	364.753
81	84.048	353.929
82	84.276	353.278
83	84.504	353.290
84	84.732	353.278
85	84.959	353.242
86	85.187	353.384
87	85.415	352.627
88	85.619	317.374
89	85.809	293.312
90	85.997	292.022
91	86.185	292.046
92	86.374	292.661
93	86.562	292.058
94	86.747	286.947
95	86.929	280.938
96	87.110	280.938
97	87.291	281.553
98	87.464	267.298
99	87.626	250.854
100	87.787	250.653
101	87.947	247.163
102	88.106	247.163
103	88.265	247.187
104	88.424	246.560
105	88.583	246.548
106	88.742	246.524
107	88.902	247.116
108	89.061	246.749
109	89.219	245.211
110	89.366	227.159
111	89.509	223.018
112	89.652	221.753
113	89.796	223.338
114	89.940	221.930
115	90.083	222.936
116	90.225	220.203
117	90.366	218.416
118	90.507	217.943
119	90.647	217.115
120	90.787	218.121
121	90.928	218.215
122	91.067	214.584
123	91.194	198.045
124	91.319	193.408
125	91.444	194.484
126	91.569	193.325
127	91.695	194.591
128	91.819	192.118
129	91.944	194.591
130	92.069	193.325

131	92.193	193.384
132	92.319	194.425
133	92.444	193.384
134	92.568	193.420
135	92.694	194.496
136	92.818	193.408
137	92.937	183.767
138	93.043	163.774
139	93.147	162.130
140	93.250	158.888
141	93.351	156.842
142	93.452	156.534
143	93.554	159.113
144	93.655	156.640
145	93.756	156.735
146	93.858	156.747
147	93.959	157.918
148	94.060	156.652
149	94.162	157.918
150	94.263	156.735

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1783.2523  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 829.6405  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	300.0	600.0	900.0	1200.0
14.000	237.0845	488.41	.	.V	Q	.	.
14.083	240.5117	497.62	.	.V	Q	.	.
14.167	244.0114	508.16	.	.V	Q	.	.
14.250	247.5803	518.20	.	.V	Q	.	.
14.333	251.2243	529.11	.	.V	Q	.	.
14.417	254.9462	540.42	.	.V	Q	.	.
14.500	258.7480	552.02	.	.V	Q	.	.
14.583	262.6305	563.75	.	.V	Q	.	.
14.667	266.6035	576.88	.	.V	Q	.	.
14.750	270.6719	590.73	.	.V	Q	.	.
14.833	274.8411	605.36	.	.V	Q	.	.
14.917	279.1199	621.29	.	.V	Q	.	.
15.000	283.5168	638.43	.	.V	.Q	.	.
15.083	288.0280	655.03	.	.V	.Q	.	.
15.167	292.6725	674.38	.	.V	.Q	.	.
15.250	297.4354	691.57	.	.V	.Q	.	.
15.333	302.3015	706.57	.	.V	.Q	.	.
15.417	307.2542	719.12	.	.V	.Q	.	.
15.500	312.2646	727.52	.	.V	.Q	.	.
15.583	317.3324	735.84	.	.V	.Q	.	.
15.667	322.4577	744.19	.	.V	.Q	.	.
15.750	327.6174	749.19	.	.V	.Q	.	.
15.833	332.8089	753.80	.	.V	.Q	.	.
15.917	338.0426	759.94	.	.V	.Q	.	.
16.000	343.3203	766.32	.	.V	.Q	.	.
16.083	348.9016	810.40	.	.V	.Q	.	.
16.167	354.7593	850.54	.	.V	.Q	.	.
16.250	360.5946	847.28	.	.V	.Q	.	.
16.333	366.4567	851.17	.	.V	.Q	.	.
16.417	372.5042	878.10	.	.V	.Q	.	.
16.500	378.5387	876.21	.	.V	.Q	.	.
16.583	384.6035	880.61	.	.V	.Q	.	.
16.667	390.9177	916.83	.	.V	.Q	.	.
16.750	397.4146	943.35	.	.V	.Q	.	.
16.833	404.0823	968.15	.	.V	.Q	.	.
16.917	411.0614	1013.37	.	.V	.Q	.	.
17.000	418.3572	1059.35	.	.V	.Q	.	.
17.083	425.6385	1057.25	.	.V	.Q	.	.
17.167	433.4260	1130.75	.	.V	.Q	.	.
17.250	440.8831	1082.77	.	.V	.Q	.	.
17.333	448.0146	1035.49	.	.V	.Q	.	.
17.417	455.1958	1042.70	.	.V	.Q	.	.
17.500	462.1572	1010.80	.	.V	.Q	.	.
17.583	469.0859	1006.04	.	.V	.Q	.	.
17.667	476.0361	1009.17	.	.V	.Q	.	.
17.750	482.8917	995.44	.	.V	.Q	.	.
17.833	489.7543	996.45	.	.V	.Q	.	.
17.917	496.5320	984.12	.	.V	.Q	.	.
18.000	503.0499	946.40	.	.V	.Q	.	.
18.083	509.3814	919.33	.	.V	.Q	.	.
18.167	515.5210	891.48	.	.V	.Q	.	.
18.250	521.4608	862.46	.	.V	.Q	.	.
18.333	527.4462	869.08	.	.V	.Q	.	.
18.417	533.1230	824.28	.	.V	.Q	.	.
18.500	538.7425	815.94	.	.V	.Q	.	.
18.583	544.2616	801.37	.	.V	.Q	.	.

18.667	549.6980	789.36	.	.	.	.	.
18.750	555.0085	771.09	.	.	.	.	.
18.833	560.2275	757.79	.	.	.	.	.
18.917	565.3054	737.31	.	.	.	.	.
19.000	570.2137	712.70	.	.	.	.	.
19.083	575.0293	699.22	.	.	.	.	.
19.167	579.7250	681.81	.	.	.	.	.
19.250	584.2957	663.67	.	.	.	.	.
19.333	588.7748	650.37	.	.	.	.	.
19.417	593.1680	637.88	.	.	.	.	.
19.500	597.4569	622.75	.	.	.	.	.
19.583	601.6688	611.56	.	.	.	.	.
19.667	605.7889	598.25	.	.	.	.	.
19.750	609.8168	584.84	.	.	.	.	.
19.833	613.7781	575.18	.	.	.	.	.
19.917	617.6622	563.98	.	.	.	.	.
20.000	621.4867	555.31	.	.	.	.	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS
USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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Irvine, CA. 92602-1309
714 - 734 - 5100

FILE NAME: LU54002E.FLD
TIME/DATE OF STUDY: 13:21 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1054.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 13627.500 ACRES
BASEFLOW = 0.000 CFS/SQUARE-MILE
\*USER ENTERED "LAG" TIME = 1.970 HOURS
VALLEY(DEVELOPED):
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010
FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060
MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.860
VALLEY(UNDEVELOPED)/DESERT:
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.070
DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600
LOW LOSS FRACTION = 0.680
\*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.17
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.45
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.90
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.39
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.53

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
5-MINUTE FACTOR = 0.610
30-MINUTE FACTOR = 0.627
1-HOUR FACTOR = 0.634
3-HOUR FACTOR = 0.922
6-HOUR FACTOR = 0.963
24-HOUR FACTOR = 0.977

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 4.230

RUNOFF HYDROGRAPH LISTING LIMITS:
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00
MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

Table with 3 columns: INTERVAL NUMBER, "S" GRAPH MEAN VALUES, and UNIT HYDROGRAPH ORDINATES (CFS). It lists 62 intervals with corresponding mean values and ordinates.

63	77.723	617.412
64	78.076	582.407
65	78.427	578.509
66	78.777	576.749
67	79.126	574.938
68	79.472	571.178
69	79.798	536.839
70	80.099	495.409
71	80.400	495.798
72	80.697	490.656
73	80.993	487.676
74	81.289	487.210
75	81.580	480.421
76	81.860	460.252
77	82.134	451.878
78	82.408	452.431
79	82.683	452.469
80	82.957	451.853
81	83.232	453.072
82	83.503	446.484
83	83.740	391.649
84	83.959	359.863
85	84.178	360.680
86	84.396	360.202
87	84.615	360.806
88	84.834	360.077
89	85.052	360.102
90	85.271	360.190
91	85.486	354.192
92	85.674	309.794
93	85.854	298.075
94	86.035	297.824
95	86.216	298.628
96	86.397	297.886
97	86.578	297.924
98	86.755	291.386
99	86.929	286.595
100	87.103	287.199
101	87.276	285.966
102	87.444	276.825
103	87.600	255.777
104	87.754	255.186
105	87.908	253.287
106	88.061	252.155
107	88.214	251.451
108	88.366	251.514
109	88.519	251.979
110	88.671	250.948
111	88.825	252.759
112	88.977	250.672
113	89.130	252.206
114	89.277	242.888
115	89.416	229.271
116	89.554	226.442
117	89.691	226.731
118	89.829	227.209
119	89.967	226.442
120	90.104	226.731
121	90.241	225.172
122	90.376	222.406
123	90.510	220.884
124	90.645	222.305
125	90.779	221.085
126	90.914	222.393
127	91.048	221.085
128	91.172	204.073
129	91.291	197.334
130	91.411	196.328

131	91.531	198.830
132	91.651	197.434
133	91.771	197.522
134	91.891	197.434
135	92.011	197.535
136	92.130	197.422
137	92.250	197.535
138	92.370	197.510
139	92.490	197.459
140	92.610	197.510
141	92.729	197.434
142	92.849	197.723
143	92.960	181.528
144	93.060	166.113
145	93.160	163.787
146	93.259	163.208
147	93.355	158.556
148	93.452	159.864
149	93.550	161.385
150	93.647	159.750

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1885.0449  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 862.3914  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	300.0	600.0	900.0	1200.0
14.000	246.3480	509.92	.	.V	Q	.	.
14.083	249.9279	519.81	.	.V	Q	.	.
14.167	253.5840	530.87	.	.V	Q	.	.
14.250	257.3141	541.61	.	.V	Q	.	.
14.333	261.1153	551.93	.	.V	Q	.	.
14.417	265.0008	564.17	.	.V	Q	.	.
14.500	268.9662	575.77	.	.V	Q	.	.
14.583	273.0120	587.46	.	.V	Q	.	.
14.667	277.1471	600.42	.	.V	Q	.	.
14.750	281.3746	613.83	.	.V	Q	.	.
14.833	285.7011	628.22	.	.V	Q	.	.
14.917	290.1342	643.68	.	.V	.Q	.	.
15.000	294.6829	660.47	.	.V	.Q	.	.
15.083	299.3468	677.20	.	.V	.Q	.	.
15.167	304.1322	694.84	.	.V	.Q	.	.
15.250	309.0482	713.80	.	.V	.Q	.	.
15.333	314.0748	729.87	.	.V	.Q	.	.
15.417	319.1851	742.01	.	.V	.Q	.	.
15.500	324.3639	751.97	.	.V	.Q	.	.
15.583	329.5995	760.20	.	.V	.Q	.	.
15.667	334.8954	768.97	.	.V	.Q	.	.
15.750	340.2332	775.05	.	.V	.Q	.	.
15.833	345.6058	780.10	.	.V	.Q	.	.
15.917	351.0285	787.38	.	.V	.Q	.	.
16.000	356.5104	795.97	.	.V	.Q	.	.
16.083	362.2735	836.80	.	.V	.Q	.	.
16.167	368.2850	872.87	.	.V	.Q	.	.
16.250	374.2897	871.88	.	.V	.Q	.	.
16.333	380.2994	872.60	.	.V	.Q	.	.
16.417	386.4855	898.22	.	.V	.Q	.	.
16.500	392.6866	900.41	.	.V	.Q	.	.
16.583	398.8773	898.89	.	.V	.Q	.	.
16.667	405.2720	928.50	.	.V	.Q	.	.
16.750	411.7811	945.12	.	.V	.Q	.	.
16.833	418.4906	974.22	.	.V	.Q	.	.
16.917	425.4405	1009.13	.	.V	.Q	.	.
17.000	432.6486	1046.61	.	.V	.Q	.	.
17.083	439.9720	1063.36	.	.V	.Q	.	.
17.167	447.4901	1091.63	.	.V	.Q	.	.
17.250	455.2249	1123.10	.	.V	.Q	.	.
17.333	462.5520	1063.89	.	.V	.Q	.	.
17.417	469.7180	1040.50	.	.V	.Q	.	.
17.500	476.9394	1048.55	.	.V	.Q	.	.
17.583	483.9023	1011.01	.	.V	.Q	.	.
17.667	490.9533	1023.81	.	.V	.Q	.	.
17.750	497.9590	1017.22	.	.V	.Q	.	.
17.833	504.8954	1007.17	.	.V	.Q	.	.
17.917	511.8279	1006.60	.	.V	.Q	.	.
18.000	518.6685	993.25	.	.V	.Q	.	.
18.083	525.2666	958.05	.	.V	.Q	.	.
18.167	531.6818	931.49	.	.V	.Q	.	.
18.250	537.9305	907.30	.	.V	.Q	.	.
18.333	543.9747	877.63	.	.V	.Q	.	.
18.417	550.0734	885.52	.	.V	.Q	.	.
18.500	555.8914	844.77	.	.V	.Q	.	.
18.583	561.6335	833.76	.	.V	.Q	.	.

18.667	567.2758	819.26	.	.	.	VQ	.
18.750	572.8293	806.37	.	.	.	Q	.
18.833	578.2794	791.34	.	.	.	Q	.
18.917	583.5986	772.36	.	.	.	Q V	.
19.000	588.8254	758.92	.	.	.	Q V	.
19.083	593.8619	731.30	.	.	.	Q V	.
19.167	598.7910	715.71	.	.	.	Q V	.
19.250	603.6048	698.96	.	.	.	Q V	.
19.333	608.3122	683.51	.	.	.	Q V	.
19.417	612.9030	666.59	.	.	.	Q V	.
19.500	617.4193	655.75	.	.	.	Q V	.
19.583	621.8412	642.07	.	.	.	Q V	.
19.667	626.1735	629.05	.	.	.	Q V	.
19.750	630.4263	617.51	.	.	.	Q V	.
19.833	634.5873	604.18	.	.	.	Q V	.
19.917	638.6630	591.78	.	.	.	Q V	.
20.000	642.6715	582.04	.	.	.	Q V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

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FILE NAME: LU55002E.FLD  
TIME/DATE OF STUDY: 13:21 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1055.00 IS CODE = 1

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>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 14658.900 ACRES  
BASEFLOW = 0.000 CFS/SQUARE-MILE  
\*USER ENTERED "LAG" TIME = 2.040 HOURS  
VALLEY(DEVELOPED):  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.860  
VALLEY(UNDEVELOPED)/DESERT:  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.070  
DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
LOW LOSS FRACTION = 0.680  
\*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.17  
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.31  
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.45  
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.89  
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.37  
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.49

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
5-MINUTE FACTOR = 0.593  
30-MINUTE FACTOR = 0.613  
1-HOUR FACTOR = 0.622  
3-HOUR FACTOR = 0.917  
6-HOUR FACTOR = 0.961  
24-HOUR FACTOR = 0.976

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 4.085

RUNOFF HYDROGRAPH LISTING LIMITS:  
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.432	766.627
2	1.297	1533.254
3	2.156	1522.304
4	3.034	1555.702
5	4.249	2154.668
6	5.546	2298.657
7	6.865	2339.350
8	8.416	2748.854
9	10.178	3124.934
10	12.262	3693.911
11	14.538	4035.702
12	17.171	4666.391
13	20.193	5358.414
14	23.054	5071.616
15	26.744	6541.220
16	29.989	5753.837
17	32.662	4738.507
18	35.292	4662.420
19	37.780	4411.130
20	39.822	3619.180
21	42.045	3941.032
22	44.107	3656.409
23	46.075	3488.571
24	48.089	3570.603
25	49.992	3373.821
26	51.571	2798.339
27	52.989	2513.236
28	54.266	2265.043
29	55.303	1838.531
30	56.601	2301.238
31	57.542	1667.630
32	58.473	1650.121
33	59.400	1642.905
34	60.303	1601.247
35	61.208	1604.067
36	62.047	1487.944
37	62.944	1589.615
38	63.707	1353.805
39	64.429	1279.983
40	65.150	1278.563
41	65.850	1239.785
42	66.497	1147.880
43	67.138	1135.977
44	67.795	1163.948
45	68.394	1061.980
46	68.992	1060.559
47	69.580	1042.611
48	70.120	957.604
49	70.652	943.307
50	71.185	944.443
51	71.700	913.281
52	72.215	912.347
53	72.729	912.537
54	73.238	902.325
55	73.727	866.415
56	74.153	754.086
57	74.573	745.145
58	74.987	734.771
59	75.395	722.639
60	75.791	702.608
61	76.162	657.649
62	76.535	661.558

63	76.912	667.103
64	77.279	651.779
65	77.644	647.153
66	77.989	610.405
67	78.328	600.937
68	78.666	600.247
69	79.003	597.623
70	79.339	594.972
71	79.667	580.987
72	79.962	523.936
73	80.252	514.347
74	80.542	513.576
75	80.828	507.083
76	81.114	506.827
77	81.399	504.433
78	81.677	493.572
79	81.943	471.539
80	82.208	470.254
81	82.473	469.402
82	82.738	470.145
83	83.003	469.415
84	83.268	470.132
85	83.529	462.260
86	83.754	399.664
87	83.966	374.534
88	84.177	374.358
89	84.388	373.614
90	84.599	374.372
91	84.810	375.156
92	85.021	372.857
93	85.232	375.102
94	85.443	372.978
95	85.629	329.927
96	85.804	310.491
97	85.979	310.423
98	86.153	309.165
99	86.328	309.747
100	86.502	309.111
101	86.676	307.461
102	86.844	298.020
103	87.013	298.764
104	87.180	297.330
105	87.347	296.532
106	87.503	275.460
107	87.652	265.180
108	87.802	265.735
109	87.950	261.718
110	88.097	261.339
111	88.245	261.326
112	88.393	262.124
113	88.540	260.555
114	88.688	262.164
115	88.835	260.649
116	88.982	262.056
117	89.129	260.676
118	89.273	255.442
119	89.407	235.871
120	89.540	235.763
121	89.672	235.262
122	89.806	236.588
123	89.938	234.194
124	90.072	237.440
125	90.203	233.341
126	90.334	231.137
127	90.464	230.677
128	90.594	230.975
129	90.724	230.461
130	90.854	231.096

131	90.985	230.542
132	91.110	222.156
133	91.226	205.979
134	91.341	204.519
135	91.458	206.006
136	91.573	204.519
137	91.689	205.993
138	91.804	204.438
139	91.921	206.088
140	92.036	204.627
141	92.152	205.993
142	92.268	204.424
143	92.384	205.871
144	92.499	204.762
145	92.615	204.424
146	92.731	206.088
147	92.847	205.885
148	92.953	188.613
149	93.051	172.328
150	93.148	171.868

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1995.2257  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 905.1052  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	300.0	600.0	900.0	1200.0
14.000	256.9830	531.03	.	.V	Q	.	.
14.083	260.7155	541.97	.	.V	Q	.	.
14.167	264.5291	553.74	.	.V	Q	.	.
14.250	268.4214	565.15	.	.V	Q	.	.
14.333	272.3904	576.31	.	.V	Q	.	.
14.417	276.4413	588.19	.	.V	Q	.	.
14.500	280.5807	601.04	.	.V	Q	.	.
14.583	284.8034	613.13	.	.V	Q	.	.
14.667	289.1150	626.04	.	.V	Q	.	.
14.750	293.5211	639.77	.	.V	.Q	.	.
14.833	298.0292	654.58	.	.V	.Q	.	.
14.917	302.6442	670.10	.	.V	.Q	.	.
15.000	307.3734	686.67	.	.V	.Q	.	.
15.083	312.2271	704.77	.	.V	.Q	.	.
15.167	317.1981	721.78	.	.V	.Q	.	.
15.250	322.3056	741.62	.	.V	.Q	.	.
15.333	327.5373	759.63	.	.V	.Q	.	.
15.417	332.8610	773.01	.	.V	.Q	.	.
15.500	338.2589	783.78	.	.V	.Q	.	.
15.583	343.7299	794.38	.	.V	.Q	.	.
15.667	349.2651	803.70	.	.V	.Q	.	.
15.750	354.8494	810.84	.	.V	.Q	.	.
15.833	360.4717	816.37	.	.V	.Q	.	.
15.917	366.1436	823.55	.	.V	.Q	.	.
16.000	371.8817	833.18	.	.V	.Q	.	.
16.083	377.9044	874.50	.	.V	.Q	.	.
16.167	384.1734	910.25	.	.V	.Q	.	.
16.250	390.4456	910.73	.	.V	.Q	.	.
16.333	396.7263	911.96	.	.V	.Q	.	.
16.417	403.1697	935.59	.	.V	.Q	.	.
16.500	409.6609	942.51	.	.V	.Q	.	.
16.583	416.1404	940.83	.	.V	.Q	.	.
16.667	422.7375	957.89	.	.V	.Q	.	.
16.750	429.4756	978.38	.	.V	.Q	.	.
16.833	436.4229	1008.74	.	.V	.Q	.	.
16.917	443.5043	1028.22	.	.V	.Q	.	.
17.000	450.8326	1064.08	.	.V	.Q	.	.
17.083	458.4153	1101.00	.	.V	.Q	.	.
17.167	465.9621	1095.80	.	.V	.Q	.	.
17.250	473.9635	1161.81	.	.V	.Q	.	.
17.333	481.7199	1126.22	.	.V	.Q	.	.
17.417	489.1857	1084.03	.	.V	.Q	.	.
17.500	496.6361	1081.80	.	.V	.Q	.	.
17.583	504.0443	1075.66	.	.V	.Q	.	.
17.667	511.2479	1045.97	.	.V	.Q	.	.
17.750	518.5619	1062.00	.	.V	.Q	.	.
17.833	525.7822	1048.38	.	.V	.Q	.	.
17.917	532.9542	1041.38	.	.V	.Q	.	.
18.000	540.1137	1039.57	.	.V	.Q	.	.
18.083	547.1530	1022.10	.	.V	.Q	.	.
18.167	553.9428	985.89	.	.V	.Q	.	.
18.250	560.5510	959.50	.	.V	.Q	.	.
18.333	567.0033	936.88	.	.V	.Q	.	.
18.417	573.2574	908.09	.	.V	.Q	.	.
18.500	579.5620	915.43	.	.V	.Q	.	.
18.583	585.5864	874.74	.	.V	.Q	.	.

18.667	591.5281	862.73	.	.	.	V	Q	.
18.750	597.3676	847.89	.	.	.	V	Q	.
18.833	603.1075	833.43	.	.	.	V	Q	.
18.917	608.7475	818.93	.	.	.	V	Q	.
19.000	614.2422	797.83	.	.	.	V	Q	.
19.083	619.6492	785.10	.	.	.	V	Q	.
19.167	624.8771	759.09	.	.	.	V	Q	.
19.250	629.9683	739.25	.	.	.	V	Q	.
19.333	634.9530	723.78	.	.	.	V	Q	.
19.417	639.8394	709.50	.	.	.	V	Q	.
19.500	644.6028	691.65	.	.	.	V	Q	.
19.583	649.2787	678.95	.	.	.	V	Q	.
19.667	653.8866	669.06	.	.	.	V	Q	.
19.750	658.3849	653.15	.	.	.	V	Q	.
19.833	662.8062	641.97	.	.	.	V	Q	.
19.917	667.1460	630.14	.	.	.	V	Q	.
20.000	671.3888	616.05	.	.	.	V	Q	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LU56002E.FLD  
 TIME/DATE OF STUDY: 13:22 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1056.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 16893.699 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 2.120 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.860  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.070  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.680  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.17  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.31  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.44  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.88  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.35  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.45

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.561  
 30-MINUTE FACTOR = 0.586  
 1-HOUR FACTOR = 0.597  
 3-HOUR FACTOR = 0.905  
 6-HOUR FACTOR = 0.956  
 24-HOUR FACTOR = 0.973

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 3.931

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.416	850.162
2	1.248	1700.324
3	2.076	1690.643
4	2.902	1688.324
5	4.028	2299.623
6	5.274	2545.385
7	6.544	2595.238
8	7.912	2795.146
9	9.603	3455.381
10	11.525	3927.237
11	13.558	4151.650
12	15.984	4957.579
13	18.769	5689.179
14	21.547	5676.795
15	24.653	6345.525
16	28.208	7263.519
17	31.057	5820.636
18	33.522	5036.637
19	36.106	5279.182
20	38.317	4515.747
21	40.319	4090.341
22	42.446	4347.152
23	44.408	4007.673
24	46.307	3879.614
25	48.238	3944.863
26	50.058	3719.943
27	51.571	3090.654
28	52.937	2791.257
29	54.186	2551.405
30	55.165	1999.967
31	56.425	2573.734
32	57.376	1943.080
33	58.258	1803.073
34	59.159	1840.717
35	60.030	1778.438
36	60.908	1794.344
37	61.728	1674.789
38	62.568	1715.986
39	63.385	1670.354
40	64.072	1403.933
41	64.771	1427.454
42	65.458	1402.920
43	66.113	1337.748
44	66.725	1252.033
45	67.354	1285.219
46	67.964	1245.470
47	68.541	1177.821
48	69.116	1175.296
49	69.675	1142.827
50	70.190	1052.560
51	70.703	1047.962
52	71.214	1043.847
53	71.710	1012.859
54	72.205	1011.861
55	72.701	1012.297
56	73.191	1001.402
57	73.667	973.750
58	74.081	845.605
59	74.486	826.027
60	74.887	820.400
61	75.280	802.350
62	75.668	793.028

63	76.030	739.096
64	76.386	728.714
65	76.750	742.525
66	77.106	728.153
67	77.460	722.589
68	77.803	700.626
69	78.130	667.487
70	78.456	666.162
71	78.781	664.354
72	79.105	662.639
73	79.427	658.056
74	79.737	631.994
75	80.017	572.809
76	80.296	570.985
77	80.574	568.117
78	80.850	562.583
79	81.125	561.851
80	81.399	559.357
81	81.667	548.788
82	81.923	523.303
83	82.178	520.684
84	82.433	520.715
85	82.688	521.510
86	82.943	520.684
87	83.198	520.762
88	83.452	518.985
89	83.682	470.337
90	83.886	415.921
91	84.089	415.406
92	84.292	414.393
93	84.496	416.279
94	84.698	413.582
95	84.902	416.170
96	85.105	414.580
97	85.308	414.409
98	85.506	405.804
99	85.678	351.576
100	85.847	344.748
101	86.015	342.706
102	86.183	343.751
103	86.351	342.722
104	86.519	343.719
105	86.686	340.555
106	86.847	330.283
107	87.009	330.642
108	87.171	329.737
109	87.333	330.657
110	87.483	307.899
111	87.627	294.089
112	87.771	294.650
113	87.914	291.626
114	88.056	289.600
115	88.198	289.709
116	88.339	289.631
117	88.482	290.551
118	88.623	289.646
119	88.765	289.756
120	88.907	290.426
121	89.049	288.945
122	89.191	291.190
123	89.324	270.630
124	89.452	261.605
125	89.580	260.888
126	89.708	261.760
127	89.836	261.760
128	89.963	260.888
129	90.091	260.763
130	90.218	260.171

131	90.344	256.227
132	90.470	258.066
133	90.595	254.325
134	90.720	256.087
135	90.845	256.211
136	90.970	254.341
137	91.093	250.834
138	91.205	230.024
139	91.316	226.393
140	91.428	228.138
141	91.539	226.393
142	91.651	230.024
143	91.762	226.377
144	91.873	226.408
145	91.985	230.009
146	92.096	226.268
147	92.207	226.657
148	92.319	227.998
149	92.430	228.138
150	92.542	228.263

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 2260.9500  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1012.4872  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	325.0	650.0	975.0	1300.0
14.000	286.6933	593.02	.	.V	Q .	.	.
14.083	290.8638	605.56	.	.V	Q .	.	.
14.167	295.1320	619.74	.	.V	Q .	.	.
14.250	299.4918	633.04	.	.V	Q .	.	.
14.333	303.9404	645.94	.	.V	Q .	.	.
14.417	308.4852	659.90	.	.V	Q .	.	.
14.500	313.1244	673.61	.	.V	Q .	.	.
14.583	317.8647	688.29	.	.V	.Q	.	.
14.667	322.7028	702.49	.	.V	.Q	.	.
14.750	327.6473	717.95	.	.V	.Q	.	.
14.833	332.7056	734.46	.	.V	.Q	.	.
14.917	337.8799	751.31	.	.V	.Q	.	.
15.000	343.1820	769.87	.	.V	.Q	.	.
15.083	348.6209	789.73	.	.V	.Q	.	.
15.167	354.1955	809.42	.	.V	.Q	.	.
15.250	359.9138	830.31	.	.V	.Q	.	.
15.333	365.7857	852.59	.	.V	.Q	.	.
15.417	371.7678	868.61	.	.V	.Q	.	.
15.500	377.8280	879.94	.	.V	.Q	.	.
15.583	383.9716	892.06	.	.V	.Q	.	.
15.667	390.1887	902.72	.	.V	.Q	.	.
15.750	396.4540	909.71	.	.V	.Q	.	.
15.833	402.7623	915.97	.	.V	.Q	.	.
15.917	409.1221	923.44	.	.V	.Q	.	.
16.000	415.5535	933.84	.	.V	.Q	.	.
16.083	422.2674	974.85	.	.V	.Q	.	.
16.167	429.2275	1010.62	.	.V	.Q	.	.
16.250	436.1911	1011.11	.	.V	.Q	.	.
16.333	443.1474	1010.06	.	.V	.Q	.	.
16.417	450.2466	1030.81	.	.V	.Q	.	.
16.500	457.3956	1038.02	.	.V	.Q	.	.
16.583	464.5480	1038.54	.	.V	.Q	.	.
16.667	471.7217	1041.62	.	.V	.Q	.	.
16.750	479.0809	1068.55	.	.V	.Q	.	.
16.833	486.6023	1092.10	.	.V	.Q	.	.
16.917	494.2206	1106.17	.	.V	.Q	.	.
17.000	502.0988	1143.92	.	.V	.Q	.	.
17.083	510.2225	1179.57	.	.V	.Q	.	.
17.167	518.3961	1186.81	.	.V	.Q	.	.
17.250	526.7872	1218.38	.	.V	.Q	.	.
17.333	535.4213	1253.67	.	.V	.Q	.	.
17.417	543.6714	1197.92	.	.V	.Q	.	.
17.500	551.7263	1169.57	.	.V	.Q	.	.
17.583	559.8682	1182.20	.	.V	.Q	.	.
17.667	567.8584	1160.18	.	.V	.Q	.	.
17.750	575.7677	1148.43	.	.V	.Q	.	.
17.833	583.7563	1159.95	.	.V	.Q	.	.
17.917	591.6565	1147.10	.	.V	.Q	.	.
18.000	599.5132	1140.79	.	.V	.Q	.	.
18.083	607.3364	1135.93	.	.V	.Q	.	.
18.167	615.0309	1117.25	.	.V	.Q	.	.
18.250	622.4661	1079.58	.	.V	.Q	.	.
18.333	629.7145	1052.47	.	.V	.Q	.	.
18.417	636.8124	1030.61	.	.V	.Q	.	.
18.500	643.6927	999.02	.	.V	.Q	.	.
18.583	650.6251	1006.59	.	.V	.Q	.	.

18.667	657.2972	968.79	.	.	.	.V	.Q.	.
18.750	663.8453	950.77	.	.	.	.V	.Q.	.
18.833	670.2895	935.70	.	.	.	.V	.Q.	.
18.917	676.6202	919.23	.	.	.	.V	.Q.	.
19.000	682.8419	903.38	.	.	.	.V	.Q.	.
19.083	688.9052	880.39	.	.	.	.Q	.	.
19.167	694.8539	863.75	.	.	.	.QV	.	.
19.250	700.6627	843.43	.	.	.	.Q	V.	.
19.333	706.2732	814.65	.	.	.	.Q	V.	.
19.417	711.7794	799.51	.	.	.	.Q	V.	.
19.500	717.1855	784.96	.	.	.	.Q	V.	.
19.583	722.4707	767.42	.	.	.	.Q	V.	.
19.667	727.6428	750.99	.	.	.	.Q	V.	.
19.750	732.7402	740.15	.	.	.	.Q	V.	.
19.833	737.7402	726.00	.	.	.	.Q	V.	.
19.917	742.6400	711.44	.	.	.	.Q	V.	.
20.000	747.4556	699.22	.	.	.	.Q	V.	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LU57002E.FLD  
TIME/DATE OF STUDY: 13:22 02/25/2004

\*\*\*\*\*

FLOW PROCESS FROM NODE 1000.00 TO NODE 1057.00 IS CODE = 1

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>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 17422.500 ACRES  
BASEFLOW = 0.000 CFS/SQUARE-MILE  
\*USER ENTERED "LAG" TIME = 2.230 HOURS  
VALLEY(DEVELOPED):  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.060  
MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.860  
VALLEY(UNDEVELOPED)/DESERT:  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.070  
DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
LOW LOSS FRACTION = 0.680  
\*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.17  
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.31  
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.44  
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.87  
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.34  
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.42

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
5-MINUTE FACTOR = 0.555  
30-MINUTE FACTOR = 0.580  
1-HOUR FACTOR = 0.592  
3-HOUR FACTOR = 0.903  
6-HOUR FACTOR = 0.955  
24-HOUR FACTOR = 0.972

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 3.737

RUNOFF HYDROGRAPH LISTING LIMITS:  
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.396	833.525
2	1.187	1667.050
3	1.975	1660.466
4	2.752	1638.284
5	3.747	2096.605
6	4.936	2503.357
7	6.136	2529.020
8	7.350	2558.988
9	8.933	3334.347
10	10.543	3393.248
11	12.467	4052.492
12	14.589	4473.132
13	16.979	5034.053
14	19.756	5852.801
15	22.311	5382.628
16	25.519	6759.879
17	28.782	6875.807
18	31.417	5551.652
19	33.747	4909.244
20	36.205	5179.314
21	38.294	4401.547
22	40.188	3990.877
23	42.225	4291.511
24	44.106	3962.407
25	45.896	3771.472
26	47.749	3904.648
27	49.536	3765.845
28	51.048	3186.440
29	52.402	2853.189
30	53.638	2602.710
31	54.665	2165.452
32	55.720	2222.326
33	56.856	2393.401
34	57.672	1718.218
35	58.530	1809.205
36	59.377	1785.068
37	60.203	1739.221
38	61.038	1760.448
39	61.809	1623.148
40	62.613	1694.812
41	63.388	1632.408
42	64.040	1373.232
43	64.704	1400.713
44	65.358	1377.356
45	65.991	1334.000
46	66.576	1231.922
47	67.163	1236.616
48	67.767	1272.287
49	68.315	1154.679
50	68.862	1153.956
51	69.407	1147.590
52	69.914	1068.869
53	70.399	1022.604
54	70.891	1035.094
55	71.369	1007.606
56	71.840	992.655
57	72.311	991.289
58	72.782	992.479
59	73.247	980.068
60	73.697	948.175
61	74.088	824.217
62	74.472	809.444

63	74.854	805.699
64	75.228	787.132
65	75.600	782.839
66	75.948	733.327
67	76.286	713.088
68	76.630	724.968
69	76.971	719.358
70	77.308	709.407
71	77.642	703.877
72	77.958	664.412
73	78.268	653.063
74	78.577	652.725
75	78.886	651.230
76	79.194	647.661
77	79.500	644.768
78	79.787	604.354
79	80.052	560.276
80	80.318	559.665
81	80.583	557.141
82	80.844	550.904
83	81.106	551.145
84	81.366	549.585
85	81.623	539.796
86	81.867	515.940
87	82.110	510.297
88	82.353	512.065
89	82.595	510.233
90	82.837	510.329
91	83.080	512.130
92	83.322	508.979
93	83.559	499.398
94	83.761	426.978
95	83.954	406.579
96	84.148	407.302
97	84.341	407.447
98	84.534	406.434
99	84.727	407.383
100	84.920	406.498
101	85.113	406.370
102	85.306	407.527
103	85.496	398.718
104	85.661	347.486
105	85.821	337.889
106	85.980	336.008
107	86.140	336.779
108	86.300	336.796
109	86.460	336.876
110	86.619	335.445
111	86.774	327.215
112	86.928	323.967
113	87.082	323.083
114	87.236	324.996
115	87.387	319.322
116	87.526	292.797
117	87.663	288.923
118	87.801	288.923
119	87.936	284.968
120	88.070	283.811
121	88.206	284.759
122	88.340	283.908
123	88.475	283.795
124	88.610	284.631
125	88.745	284.149
126	88.880	283.634
127	89.015	284.759
128	89.150	284.840
129	89.279	272.510
130	89.402	259.264

131	89.523	255.325
132	89.645	255.358
133	89.767	257.383
134	89.888	255.583
135	90.010	257.094
136	90.131	255.486
137	90.252	254.264
138	90.371	249.956
139	90.490	251.821
140	90.610	251.966
141	90.728	249.924
142	90.847	249.924
143	90.967	251.821
144	91.083	246.146
145	91.191	227.177
146	91.297	223.287
147	91.402	221.647
148	91.507	221.519
149	91.614	225.168
150	91.720	223.416

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 2302.2517  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1020.9495  
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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

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

-----

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	325.0	650.0	975.0	1300.0
14.000	285.1167	594.40	.	.V	Q .	.	.
14.083	289.2947	606.66	.	.V	Q .	.	.
14.167	293.5712	620.95	.	.V	Q .	.	.
14.250	297.9449	635.06	.	.V	Q .	.	.
14.333	302.4098	648.30	.	.V	Q .	.	.
14.417	306.9692	662.03	.	.V	Q .	.	.
14.500	311.6267	676.27	.	.V	Q .	.	.
14.583	316.3783	689.92	.	.V	.Q	.	.
14.667	321.2249	703.73	.	.V	.Q	.	.
14.750	326.1795	719.42	.	.V	.Q	.	.
14.833	331.2360	734.19	.	.V	.Q	.	.
14.917	336.4042	750.42	.	.V	.Q	.	.
15.000	341.6896	767.45	.	.V	.Q	.	.
15.083	347.0990	785.44	.	.V	.Q	.	.
15.167	352.6436	805.06	.	.V	.Q	.	.
15.250	358.3136	823.29	.	.V	.Q	.	.
15.333	364.1284	844.31	.	.V	.Q	.	.
15.417	370.0689	862.57	.	.V	.Q	.	.
15.500	376.0941	874.86	.	.V	.Q	.	.
15.583	382.1970	886.14	.	.V	.Q	.	.
15.667	388.3844	898.41	.	.V	.Q	.	.
15.750	394.6292	906.75	.	.V	.Q	.	.
15.833	400.9122	912.29	.	.V	.Q	.	.
15.917	407.2520	920.54	.	.V	.Q	.	.
16.000	413.6698	931.87	.	.V	.Q	.	.
16.083	420.3612	971.59	.	.V	.Q	.	.
16.167	427.3042	1008.12	.	.V	.Q	.	.
16.250	434.2624	1010.33	.	.V	.Q	.	.
16.333	441.2238	1010.79	.	.V	.Q	.	.
16.417	448.3055	1028.26	.	.V	.Q	.	.
16.500	455.4836	1042.26	.	.V	.Q	.	.
16.583	462.6672	1043.07	.	.V	.Q	.	.
16.667	469.8401	1041.51	.	.V	.Q	.	.
16.750	477.2012	1068.83	.	.V	.Q	.	.
16.833	484.5974	1073.93	.	.V	.Q	.	.
16.917	492.2130	1105.78	.	.V	.Q	.	.
17.000	499.9673	1125.93	.	.V	.Q	.	.
17.083	507.9101	1153.30	.	.V	.Q	.	.
17.167	516.1028	1189.58	.	.V	.Q	.	.
17.250	524.2299	1180.06	.	.V	.Q	.	.
17.333	532.7498	1237.09	.	.V	.Q	.	.
17.417	541.2930	1240.46	.	.V	.Q	.	.
17.500	549.4977	1191.32	.	.V	.Q	.	.
17.583	557.5400	1167.75	.	.V	.Q	.	.
17.667	565.6824	1182.26	.	.V	.Q	.	.
17.750	573.6590	1158.21	.	.V	.Q	.	.
17.833	581.5560	1146.64	.	.V	.Q	.	.
17.917	589.5339	1158.40	.	.V	.Q	.	.
18.000	597.4299	1146.49	.	.V	.Q	.	.
18.083	605.2473	1135.09	.	.V	.Q	.	.
18.167	613.0427	1131.89	.	.V	.Q	.	.
18.250	620.7421	1117.96	.	.V	.Q	.	.
18.333	628.1996	1082.82	.	.V	.Q	.	.
18.417	635.4641	1054.80	.	.V	.Q	.	.
18.500	642.5768	1032.77	.	.V	.Q	.	.
18.583	649.5076	1006.36	.	.V	.Q	.	.

18.667	656.3666	995.92	.	.	.	.V	Q	.
18.750	663.1674	987.48	.	.	.	.V	Q	.
18.833	669.7053	949.30	.	.	.	.	V	Q.
18.917	676.1641	937.83	.	.	.	.	V	Q .
19.000	682.5103	921.47	.	.	.	.	V	Q .
19.083	688.7401	904.56	.	.	.	.	V	Q .
19.167	694.8481	886.88	.	.	.	.	Q	.
19.250	700.8014	864.42	.	.	.	.	Q	.
19.333	706.6426	848.14	.	.	.	.	Q	.
19.417	712.3375	826.91	.	.	.	.	Q	V .
19.500	717.8578	801.56	.	.	.	.	Q	V .
19.583	723.2892	788.64	.	.	.	.	Q	V .
19.667	728.6163	773.49	.	.	.	.	Q	V .
19.750	733.8408	758.60	.	.	.	.	Q	V .
19.833	738.9572	742.89	.	.	.	.	Q	V .
19.917	743.9903	730.81	.	.	.	.	Q	V .
20.000	748.9500	720.15	.	.	.	.	Q	V .

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 Irvine, CA. 92602-1309  
 714 - 734 - 5100

-----  
 FILE NAME: LU58002E.FLD  
 TIME/DATE OF STUDY: 13:23 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1058.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 23888.100 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 2.350 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.070  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.840  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.080  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.680  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.17  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.31  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.44  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.86  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.31  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.36

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.491  
 30-MINUTE FACTOR = 0.522  
 1-HOUR FACTOR = 0.541  
 3-HOUR FACTOR = 0.872  
 6-HOUR FACTOR = 0.943  
 24-HOUR FACTOR = 0.965

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 3.546

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.373	1076.923
2	1.118	2153.846
3	1.862	2148.744
4	2.595	2118.143
5	3.457	2488.250
6	4.571	3220.655
7	5.692	3236.994
8	6.832	3292.484
9	8.133	3760.250
10	9.648	4376.095
11	11.397	5054.130
12	13.178	5144.248
13	15.319	6185.728
14	17.670	6792.333
15	20.289	7564.821
16	22.708	6988.871
17	25.857	9098.312
18	28.842	8623.701
19	31.316	7145.952
20	33.509	6336.075
21	35.836	6723.210
22	37.878	5899.116
23	39.663	5157.566
24	41.631	5684.051
25	43.467	5303.765
26	45.206	5024.196
27	47.031	5272.312
28	48.794	5094.353
29	50.406	4655.989
30	51.763	3920.104
31	53.004	3586.457
32	54.165	3353.119
33	55.051	2558.946
34	56.178	3256.866
35	57.178	2889.904
36	57.952	2236.045
37	58.780	2389.660
38	59.586	2330.281
39	60.379	2290.365
40	61.185	2329.157
41	61.919	2118.643
42	62.681	2202.752
43	63.447	2212.692
44	64.070	1798.904
45	64.705	1836.286
46	65.335	1820.130
47	65.953	1784.181
48	66.526	1656.475
49	67.082	1604.193
50	67.659	1667.473
51	68.201	1567.781
52	68.723	1507.852
53	69.244	1504.832
54	69.758	1483.717
55	70.231	1368.177
56	70.694	1337.761
57	71.166	1361.190
58	71.618	1307.983
59	72.066	1293.921
60	72.513	1291.320
61	72.961	1294.318
62	73.404	1277.721

63	73.838	1254.732
64	74.218	1097.293
65	74.584	1059.470
66	74.950	1056.803
67	75.308	1033.241
68	75.662	1022.177
69	76.006	994.846
70	76.329	931.720
71	76.651	930.883
72	76.981	953.100
73	77.303	929.869
74	77.622	922.441
75	77.936	908.621
76	78.233	856.516
77	78.527	851.182
78	78.821	849.485
79	79.115	846.840
80	79.407	843.468
81	79.696	837.054
82	79.973	799.959
83	80.226	730.353
84	80.478	728.546
85	80.730	726.628
86	80.978	718.429
87	81.226	713.976
88	81.473	715.784
89	81.718	707.188
90	81.956	687.836
91	82.186	663.524
92	82.415	660.857
93	82.644	662.422
94	82.874	665.023
95	83.103	660.703
96	83.333	663.811
97	83.562	661.673
98	83.784	642.343
99	83.976	554.862
100	84.158	526.605
101	84.340	526.253
102	84.523	526.385
103	84.705	526.583
104	84.887	526.253
105	85.069	526.385
106	85.252	526.473
107	85.434	526.253
108	85.616	526.517
109	85.784	484.815
110	85.936	439.852
111	86.087	435.752
112	86.238	435.862
113	86.389	435.730
114	86.539	435.620
115	86.691	437.295
116	86.841	432.953
117	86.986	421.359
118	87.131	416.400
119	87.275	416.334
120	87.419	416.246
121	87.562	415.033
122	87.695	382.809
123	87.823	369.717
124	87.952	373.442
125	88.080	368.240
126	88.206	364.824
127	88.333	365.750
128	88.459	364.714
129	88.585	365.970
130	88.712	365.948

131	88.838	364.758
132	88.965	365.794
133	89.091	363.457
134	89.218	367.469
135	89.344	363.237
136	89.466	352.503
137	89.579	328.456
138	89.694	330.065
139	89.808	329.580
140	89.922	328.698
141	90.036	331.365
142	90.150	328.478
143	90.264	329.558
144	90.378	328.236
145	90.489	320.984
146	90.599	319.441
147	90.711	324.092
148	90.822	319.243
149	90.933	321.403
150	91.045	322.108

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 3068.6624  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1332.0977  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	400.0	800.0	1200.0	1600.0
14.000	372.5967	776.84	.	.V	Q.	.	.
14.083	378.0607	793.37	.	.V	Q.	.	.
14.167	383.6521	811.87	.	.V	Q	.	.
14.250	389.3738	830.79	.	.V	Q	.	.
14.333	395.2234	849.36	.	.V	.Q	.	.
14.417	401.2022	868.13	.	.V	.Q	.	.
14.500	407.3132	887.32	.	.V	.Q	.	.
14.583	413.5532	906.05	.	.V	.Q	.	.
14.667	419.9199	924.46	.	.V	.Q	.	.
14.750	426.4122	942.67	.	.V	.Q	.	.
14.833	433.0456	963.17	.	.V	.Q	.	.
14.917	439.8260	984.52	.	.V	.Q	.	.
15.000	446.7465	1004.85	.	.V	.Q	.	.
15.083	453.8232	1027.54	.	.V	.Q	.	.
15.167	461.0625	1051.15	.	.V	.Q	.	.
15.250	468.4738	1076.11	.	.V	.Q	.	.
15.333	476.0460	1099.48	.	.V	.Q	.	.
15.417	483.7833	1123.46	.	.V	.Q	.	.
15.500	491.6552	1142.99	.	.V	.Q	.	.
15.583	499.6405	1159.47	.	.V	.Q	.	.
15.667	507.7258	1173.99	.	.V	.Q	.	.
15.750	515.9019	1187.16	.	.V	.Q	.	.
15.833	524.1354	1195.52	.	.V	.Q	.	.
15.917	532.4307	1204.48	.	.V	.Q	.	.
16.000	540.8239	1218.69	.	.V	.Q	.	.
16.083	549.5025	1260.13	.	.V	.Q	.	.
16.167	558.4207	1294.91	.	.V	.Q	.	.
16.250	567.3582	1297.73	.	.V	.Q	.	.
16.333	576.3172	1300.85	.	.V	.Q	.	.
16.417	585.3654	1313.80	.	.V	.Q	.	.
16.500	594.5554	1334.38	.	.V	.Q	.	.
16.583	603.7290	1332.01	.	.V	.Q	.	.
16.667	612.9203	1334.59	.	.V	.Q	.	.
16.750	622.1622	1341.91	.	.V	.Q	.	.
16.833	631.5176	1358.41	.	.V	.Q	.	.
16.917	641.0251	1380.50	.	.V	.Q	.	.
17.000	650.6031	1390.72	.	.V	.Q	.	.
17.083	660.4004	1422.56	.	.V	.Q	.	.
17.167	670.3354	1442.57	.	.V	.Q	.	.
17.250	680.4748	1472.23	.	.V	.Q	.	.
17.333	690.5725	1466.19	.	.V	.Q	.	.
17.417	701.0995	1528.52	.	.V	.Q	.	.
17.500	711.5280	1514.20	.	.V	.Q	.	.
17.583	721.6985	1476.77	.	.V	.Q	.	.
17.667	731.7268	1456.11	.	.V	.Q	.	.
17.750	741.8683	1472.56	.	.V	.Q	.	.
17.833	751.8983	1456.35	.	.V	.Q	.	.
17.917	761.8207	1440.73	.	.V	.Q	.	.
18.000	771.8480	1455.97	.	.V	.Q	.	.
18.083	781.8036	1445.56	.	.V	.Q	.	.
18.167	791.6684	1432.36	.	.V	.Q	.	.
18.250	801.5058	1428.39	.	.V	.Q	.	.
18.333	811.2482	1414.60	.	.V	.Q	.	.
18.417	820.7944	1386.10	.	.V	.Q	.	.
18.500	830.0729	1347.24	.	.V	.Q	.	.
18.583	839.1842	1322.95	.	.V	.Q	.	.

18.667	848.1586	1303.09	.	.	.	.V	.Q	.
18.750	856.8925	1268.15	.	.	.	.V	.Q	.
18.833	865.6428	1270.55	.	.	.	.V	.Q	.
18.917	874.1920	1241.34	.	.	.	.V	.Q	.
19.000	882.4973	1205.93	.	.	.	.V	.Q	.
19.083	890.6895	1189.51	.	.	.	.V	.Q	.
19.167	898.7354	1168.26	.	.	.	.V	.Q	.
19.250	906.6210	1144.99	.	.	.	.V	.Q	.
19.333	914.3560	1123.12	.	.	.	.V	.Q	.
19.417	921.8813	1092.68	.	.	.	.V	.Q	.
19.500	929.2612	1071.57	.	.	.	.V	.Q	.
19.583	936.4954	1050.39	.	.	.	.V	.Q	.
19.667	943.5245	1020.63	.	.	.	.V	.Q	.
19.750	950.4402	1004.16	.	.	.	.V	.Q	.
19.833	957.2287	985.69	.	.	.	.V	.Q	.
19.917	963.9031	969.13	.	.	.	.V	.Q	.
20.000	970.4456	949.97	.	.	.	.V	.Q	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LU59002E.FLD  
 TIME/DATE OF STUDY: 13:23 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1059.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 25469.000 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 2.410 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.070  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.840  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.080  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.690  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.17  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.31  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.43  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.85  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.29  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.32

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.476  
 30-MINUTE FACTOR = 0.511  
 1-HOUR FACTOR = 0.531  
 3-HOUR FACTOR = 0.866  
 6-HOUR FACTOR = 0.940  
 24-HOUR FACTOR = 0.963

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 3.458

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.363	1119.608
2	1.090	2239.215
3	1.816	2235.295
4	2.531	2202.525
5	3.340	2490.843
6	4.419	3324.390
7	5.508	3352.571
8	6.621	3429.020
9	7.814	3674.625
10	9.325	4655.574
11	10.890	4819.487
12	12.637	5381.712
13	14.637	6159.051
14	16.823	6733.723
15	19.377	7867.094
16	21.723	7225.346
17	24.507	8576.258
18	27.654	9693.394
19	30.211	7874.091
20	32.420	6804.519
21	34.645	6853.557
22	36.886	6903.541
23	38.623	5348.175
24	40.472	5695.255
25	42.359	5814.728
26	44.120	5421.636
27	45.809	5203.675
28	47.595	5501.088
29	49.301	5254.823
30	50.776	4542.452
31	52.075	4000.430
32	53.262	3658.004
33	54.357	3371.589
34	55.211	2630.349
35	56.345	3492.707
36	57.268	2842.798
37	58.027	2338.506
38	58.834	2486.906
39	59.619	2417.171
40	60.392	2381.181
41	61.179	2424.597
42	61.895	2203.323
43	62.634	2278.534
44	63.391	2331.409
45	64.002	1881.095
46	64.621	1905.734
47	65.236	1897.063
48	65.842	1865.456
49	66.411	1751.858
50	66.952	1668.152
51	67.507	1709.465
52	68.054	1684.743
53	68.563	1566.633
54	69.072	1566.375
55	69.578	1559.043
56	70.054	1466.853
57	70.506	1393.088
58	70.962	1402.652
59	71.414	1393.934
60	71.850	1343.809
61	72.287	1344.819
62	72.723	1343.621

63	73.158	1340.307
64	73.588	1322.354
65	73.994	1251.925
66	74.353	1105.780
67	74.710	1100.046
68	75.066	1094.383
69	75.412	1067.170
70	75.757	1062.000
71	76.086	1012.909
72	76.399	964.312
73	76.715	973.336
74	77.036	989.409
75	77.349	962.808
76	77.660	958.836
77	77.965	940.882
78	78.254	887.655
79	78.541	884.883
80	78.827	882.768
81	79.113	881.005
82	79.398	875.976
83	79.681	872.052
84	79.953	836.450
85	80.200	761.885
86	80.446	756.668
87	80.691	757.067
88	80.934	747.903
89	81.175	743.132
90	81.417	743.532
91	81.657	739.184
92	81.891	722.194
93	82.116	693.031
94	82.340	688.801
95	82.563	687.203
96	82.787	689.999
97	83.011	690.164
98	83.234	687.320
99	83.458	688.660
100	83.680	685.511
101	83.883	624.247
102	84.062	552.126
103	84.240	547.403
104	84.417	546.063
105	84.595	548.719
106	84.773	546.063
107	84.950	547.379
108	85.129	548.977
109	85.306	545.781
110	85.484	547.544
111	85.660	544.442
112	85.818	487.056
113	85.966	453.192
114	86.113	454.673
115	86.260	452.957
116	86.407	451.641
117	86.555	454.790
118	86.702	452.981
119	86.848	451.101
120	86.990	436.578
121	87.131	434.205
122	87.271	431.432
123	87.411	432.983
124	87.552	432.865
125	87.682	399.378
126	87.807	387.605
127	87.932	384.761
128	88.058	385.654
129	88.181	379.944
130	88.304	377.970

131	88.427	381.307
132	88.551	379.685
133	88.674	379.709
134	88.797	379.685
135	88.920	379.215
136	89.044	380.085
137	89.167	379.826
138	89.291	381.025
139	89.412	372.377
140	89.525	350.217
141	89.636	341.710
142	89.748	344.365
143	89.859	342.180
144	89.971	342.955
145	90.081	341.428
146	90.193	344.624
147	90.304	341.710
148	90.415	339.618
149	90.523	333.038
150	90.632	336.281

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 3259.8770  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1343.0247  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	400.0	800.0	1200.0	1600.0
14.000	373.7051	777.80	.	.V	Q.	.	.
14.083	379.1789	794.79	.	.V	Q.	.	.
14.167	384.7831	813.74	.	.V	Q	.	.
14.250	390.5156	832.36	.	.V	Q	.	.
14.333	396.3790	851.37	.	.V	.Q	.	.
14.417	402.3752	870.65	.	.V	.Q	.	.
14.500	408.5095	890.70	.	.V	.Q	.	.
14.583	414.7765	909.96	.	.V	.Q	.	.
14.667	421.1734	928.84	.	.V	.Q	.	.
14.750	427.7007	947.77	.	.V	.Q	.	.
14.833	434.3650	967.65	.	.V	.Q	.	.
14.917	441.1765	989.03	.	.V	.Q	.	.
15.000	448.1358	1010.49	.	.V	.Q	.	.
15.083	455.2480	1032.70	.	.V	.Q	.	.
15.167	462.5213	1056.08	.	.V	.Q	.	.
15.250	469.9696	1081.50	.	.V	.Q	.	.
15.333	477.5802	1105.05	.	.V	.Q	.	.
15.417	485.3466	1127.68	.	.V	.Q	.	.
15.500	493.2575	1148.66	.	.V	.Q	.	.
15.583	501.2867	1165.84	.	.V	.Q	.	.
15.667	509.4210	1181.10	.	.V	.Q	.	.
15.750	517.6447	1194.08	.	.V	.Q	.	.
15.833	525.9371	1204.06	.	.V	.Q	.	.
15.917	534.2896	1212.79	.	.V	.Q	.	.
16.000	542.7353	1226.31	.	.V	.Q	.	.
16.083	551.4653	1267.60	.	.V	.Q	.	.
16.167	560.4229	1300.63	.	.V	.Q	.	.
16.250	569.3995	1303.42	.	.V	.Q	.	.
16.333	578.3912	1305.59	.	.V	.Q	.	.
16.417	587.4583	1316.54	.	.V	.Q	.	.
16.500	596.6810	1339.14	.	.V	.Q	.	.
16.583	605.8884	1336.90	.	.V	.Q	.	.
16.667	615.1094	1338.90	.	.V	.Q	.	.
16.750	624.3561	1342.62	.	.V	.Q	.	.
16.833	633.7346	1361.75	.	.V	.Q	.	.
16.917	643.1627	1368.96	.	.V	.Q	.	.
17.000	652.7420	1390.91	.	.V	.Q	.	.
17.083	662.4808	1414.07	.	.V	.Q	.	.
17.167	672.3348	1430.81	.	.V	.Q	.	.
17.250	682.4304	1465.88	.	.V	.Q	.	.
17.333	692.4850	1459.92	.	.V	.Q	.	.
17.417	702.8283	1501.85	.	.V	.Q	.	.
17.500	713.3514	1527.95	.	.V	.Q	.	.
17.583	723.5759	1484.60	.	.V	.Q	.	.
17.667	733.6307	1459.95	.	.V	.Q	.	.
17.750	743.7202	1464.98	.	.V	.Q	.	.
17.833	753.8600	1472.31	.	.V	.Q	.	.
17.917	763.7728	1439.35	.	.V	.Q	.	.
18.000	773.7687	1451.40	.	.V	.Q	.	.
18.083	783.7756	1453.00	.	.V	.Q	.	.
18.167	793.7086	1442.27	.	.V	.Q	.	.
18.250	803.5337	1426.60	.	.V	.Q	.	.
18.333	813.3512	1425.50	.	.V	.Q	.	.
18.417	823.0367	1406.34	.	.V	.Q	.	.
18.500	832.4694	1369.62	.	.V	.Q	.	.
18.583	841.6935	1339.33	.	.V	.Q	.	.

18.667	850.7642	1317.06	.	.	.	.V	.Q	.
18.750	859.6890	1295.88	.	.	.	.V	.Q	.
18.833	868.3841	1262.54	.	.	.	.V	.Q	.
18.917	877.1195	1268.38	.	.	.	.V	.Q	.
19.000	885.6064	1232.29	.	.	.	.V	.Q	.
19.083	893.8777	1200.99	.	.	.	.V	.Q	.
19.167	902.0291	1183.58	.	.	.	.V	.Q	.
19.250	910.0302	1161.77	.	.	.	.V	.Q	.
19.333	917.8760	1139.22	.	.	.	.V	.Q	.
19.417	925.5591	1115.58	.	.	.	.Q	.	.
19.500	933.0360	1085.65	.	.	.	.Q	.	.
19.583	940.3782	1066.09	.	.	.	.Q	.V	.
19.667	947.5891	1047.02	.	.	.	.Q	.V	.
19.750	954.5940	1017.12	.	.	.	.Q	.V	.
19.833	961.4852	1000.60	.	.	.	.Q	.V	.
19.917	968.2585	983.49	.	.	.	.Q	.V	.
20.000	974.9186	967.05	.	.	.	.Q	.V	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Analysis prepared by:

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 FILE NAME: LU60002E.FLD  
 TIME/DATE OF STUDY: 13:24 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1060.00 IS CODE = 1

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 >>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<  
 =====

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 26854.801 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 2.600 HOURS  
 VALLEY(DEVELOPED):  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.070  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.840  
 VALLEY(UNDEVELOPED)/DESERT:  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.080  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.700  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.16  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.31  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.43  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.84  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.27  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.28

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.466  
 30-MINUTE FACTOR = 0.502  
 1-HOUR FACTOR = 0.523  
 3-HOUR FACTOR = 0.860  
 6-HOUR FACTOR = 0.938  
 24-HOUR FACTOR = 0.962

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 3.205

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.337	1094.258
2	1.011	2188.516
3	1.684	2187.619
4	2.348	2156.704
5	3.033	2223.179
6	3.982	3081.768
7	4.988	3269.334
8	6.011	3320.341
9	7.037	3331.578
10	8.268	3999.594
11	9.634	4437.508
12	11.202	5090.806
13	12.786	5145.498
14	14.665	6102.932
15	16.679	6540.865
16	19.038	7661.619
17	21.264	7227.911
18	23.626	7671.406
19	26.585	9609.354
20	29.153	8340.021
21	31.396	7286.511
22	33.353	6354.968
23	35.452	6818.652
24	37.428	6416.140
25	38.993	5082.604
26	40.738	5667.015
27	42.473	5633.564
28	44.106	5303.627
29	45.661	5050.169
30	47.328	5416.208
31	48.913	5146.941
32	50.367	4722.290
33	51.598	3997.237
34	52.740	3710.959
35	53.810	3474.140
36	54.699	2887.685
37	55.573	2838.017
38	56.629	3430.171
39	57.403	2513.210
40	58.118	2321.933
41	58.867	2431.999
42	59.594	2360.476
43	60.310	2327.694
44	61.042	2375.392
45	61.718	2196.232
46	62.383	2161.109
47	63.107	2351.134
48	63.720	1990.646
49	64.282	1825.225
50	64.858	1869.455
51	65.425	1842.075
52	65.983	1810.606
53	66.500	1679.231
54	67.001	1629.724
55	67.517	1675.192
56	68.026	1652.817
57	68.497	1530.908
58	68.969	1531.800
59	69.439	1525.258
60	69.894	1479.542
61	70.316	1369.997
62	70.734	1358.401

63	71.161	1387.069
64	71.571	1330.054
65	71.976	1314.369
66	72.380	1313.403
67	72.785	1313.700
68	73.187	1308.497
69	73.585	1292.341
70	73.965	1232.749
71	74.299	1084.649
72	74.630	1074.985
73	74.961	1073.747
74	75.284	1051.149
75	75.604	1037.669
76	75.920	1026.345
77	76.214	955.628
78	76.504	943.065
79	76.799	958.205
80	77.097	965.019
81	77.386	938.878
82	77.674	935.880
83	77.957	919.526
84	78.224	868.829
85	78.491	864.493
86	78.757	863.774
87	79.022	861.247
88	79.286	858.373
89	79.549	854.706
90	79.809	844.150
91	80.049	779.578
92	80.277	740.576
93	80.505	738.718
94	80.732	739.437
95	80.957	728.708
96	81.181	727.146
97	81.405	728.039
98	81.627	721.224
99	81.846	711.982
100	82.056	680.489
101	82.263	672.238
102	82.470	673.700
103	82.678	674.022
104	82.885	673.749
105	83.092	672.039
106	83.299	673.898
107	83.506	672.188
108	83.712	667.282
109	83.896	598.745
110	84.062	538.781
111	84.227	534.296
112	84.391	534.197
113	84.556	535.981
114	84.721	534.618
115	84.885	534.346
116	85.050	535.956
117	85.215	534.371
118	85.379	534.470
119	85.544	534.321
120	85.706	526.144
121	85.847	458.103
122	85.984	444.227
123	86.120	443.310
124	86.257	443.434
125	86.393	441.625
126	86.529	443.434
127	86.666	443.285
128	86.802	443.310
129	86.935	430.227
130	87.066	425.470

131	87.196	421.802
132	87.326	422.100
133	87.456	425.148
134	87.585	416.971
135	87.704	385.527
136	87.820	376.954
137	87.936	377.201
138	88.051	375.170
139	88.166	372.890
140	88.280	370.586
141	88.394	370.908
142	88.509	370.734
143	88.623	372.097
144	88.737	370.759
145	88.852	371.131
146	88.966	372.023
147	89.080	369.322
148	89.194	371.824
149	89.309	371.478
150	89.421	365.159

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 3430.3850  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1320.2793  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	375.0	750.0	1125.0	1500.0
14.000	362.2047	749.91	.	V	Q.	.	.
14.083	367.4735	765.03	.	.V	Q	.	.
14.167	372.8684	783.34	.	.V	Q	.	.
14.250	378.3889	801.57	.	.V	.Q	.	.
14.333	384.0317	819.34	.	.V	.Q	.	.
14.417	389.7953	836.87	.	.V	.Q	.	.
14.500	395.6955	856.72	.	.V	.Q	.	.
14.583	401.7321	876.52	.	.V	.Q	.	.
14.667	407.9016	895.80	.	.V	.Q	.	.
14.750	414.1966	914.03	.	.V	.Q	.	.
14.833	420.6235	933.19	.	.V	.Q	.	.
14.917	427.1856	952.81	.	.V	.Q	.	.
15.000	433.8856	972.84	.	.V	.Q	.	.
15.083	440.7226	992.73	.	.V	.Q	.	.
15.167	447.7145	1015.23	.	.V	.Q	.	.
15.250	454.8569	1037.08	.	.V	.Q	.	.
15.333	462.1617	1060.65	.	.V	.Q	.	.
15.417	469.5992	1079.93	.	.V	.Q	.	.
15.500	477.1514	1096.58	.	.V	.Q	.	.
15.583	484.8468	1117.37	.	.V	.Q	.	.
15.667	492.6693	1135.83	.	.V	.Q	.	.
15.750	500.5972	1151.12	.	.V	.Q	.	.
15.833	508.5976	1161.66	.	.V	.Q	.	.
15.917	516.6891	1174.90	.	.V	.Q	.	.
16.000	524.8891	1190.63	.	.V	.Q	.	.
16.083	533.3208	1224.29	.	.V	.Q	.	.
16.167	541.9538	1253.51	.	.V	.Q	.	.
16.250	550.6245	1258.98	.	.V	.Q	.	.
16.333	559.3141	1261.74	.	.V	.Q	.	.
16.417	568.0593	1269.80	.	.V	.Q	.	.
16.500	576.9613	1292.57	.	.V	.Q	.	.
16.583	585.9141	1299.95	.	.V	.Q	.	.
16.667	594.8755	1301.19	.	.V	.Q	.	.
16.750	603.8531	1303.55	.	.V	.Q	.	.
16.833	612.9407	1319.53	.	.V	.Q	.	.
16.917	622.0715	1325.79	.	.V	.Q	.	.
17.000	631.2917	1338.77	.	.V	.Q	.	.
17.083	640.5444	1343.48	.	.V	.Q	.	.
17.167	649.9705	1368.67	.	.V	.Q	.	.
17.250	659.4731	1379.79	.	.V	.Q	.	.
17.333	669.1431	1404.08	.	.V	.Q	.	.
17.417	678.8220	1405.37	.	.V	.Q	.	.
17.500	688.6201	1422.70	.	.V	.Q	.	.
17.583	698.6718	1459.50	.	.V	.Q	.	.
17.667	708.5616	1436.00	.	.V	.Q	.	.
17.750	718.3234	1417.41	.	.V	.Q	.	.
17.833	727.9739	1401.25	.	.V	.Q	.	.
17.917	737.7231	1415.60	.	.V	.Q	.	.
18.000	747.4268	1408.96	.	.V	.Q	.	.
18.083	756.9729	1386.10	.	.V	.Q	.	.
18.167	766.5709	1393.63	.	.V	.Q	.	.
18.250	776.1367	1388.95	.	.V	.Q	.	.
18.333	785.6242	1377.59	.	.V	.Q	.	.
18.417	795.0236	1364.79	.	.V	.Q	.	.
18.500	804.3824	1358.91	.	.V	.Q	.	.
18.583	813.5913	1337.13	.	.V	.Q	.	.

18.667	822.6357	1313.24	.	.	.	.	V	.	Q	.
18.750	831.4803	1284.25	.	.	.	.	V	.	Q	.
18.833	840.1940	1265.22	.	.	.	.	V	.	Q	.
18.917	848.7706	1245.32	.	.	.	.	V	.	Q	.
19.000	857.1686	1219.39	.	.	.	.	V	.	Q	.
19.083	865.4681	1205.08	.	.	.	.	V	.	Q	.
19.167	873.7113	1196.92	.	.	.	.	V	.	Q	.
19.250	881.6948	1159.20	.	.	.	.	V	.	Q	.
19.333	889.5101	1134.78	.	.	.	.	V	.	Q	.
19.417	897.2043	1117.21	.	.	.	.	V	.	Q	.
19.500	904.7563	1096.55	.	.	.	.	V	.	Q	.
19.583	912.1369	1071.66	.	.	.	.	V	.	Q	.
19.667	919.3676	1049.90	.	.	.	.	V	.	Q	.
19.750	926.4457	1027.74	.	.	.	.	V	.	Q	.
19.833	933.4011	1009.93	.	.	.	.	V	.	Q	.
19.917	940.2498	994.43	.	.	.	.	V	.	Q	.
20.000	946.9349	970.68	.	.	.	.	V	.	Q	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Analysis prepared by:

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 FILE NAME: LU61002E.FLD  
 TIME/DATE OF STUDY: 13:24 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1061.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 32181.301 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 2.820 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.080  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.810  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.100  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.710  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.16  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.30  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.43  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.82  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.23  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.20

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.429  
 30-MINUTE FACTOR = 0.467  
 1-HOUR FACTOR = 0.491  
 3-HOUR FACTOR = 0.839  
 6-HOUR FACTOR = 0.929  
 24-HOUR FACTOR = 0.957

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.955

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.308	1197.306
2	0.923	2394.610
3	1.538	2394.610
4	2.147	2371.040
5	2.754	2359.815
6	3.510	2944.605
7	4.436	3601.076
8	5.354	3575.118
9	6.298	3672.988
10	7.241	3670.593
11	8.458	4737.376
12	9.670	4717.021
13	11.148	5749.750
14	12.576	5557.688
15	14.265	6573.037
16	16.072	7035.848
17	18.147	8073.263
18	20.277	8291.589
19	22.222	7570.107
20	24.762	9886.068
21	27.418	10335.754
22	29.563	8348.748
23	31.545	7712.686
24	33.373	7115.737
25	35.307	7525.538
26	37.134	7109.509
27	38.585	5649.517
28	40.198	6277.970
29	41.864	6482.481
30	43.405	5996.436
31	44.878	5735.167
32	46.456	6141.620
33	48.004	6023.827
34	49.509	5855.779
35	50.774	4925.882
36	51.916	4443.296
37	52.969	4098.545
38	53.977	3922.035
39	54.808	3234.478
40	55.617	3149.511
41	56.619	3899.825
42	57.404	3053.187
43	58.060	2552.636
44	58.757	2712.919
45	59.448	2688.913
46	60.121	2619.668
47	60.794	2622.445
48	61.483	2679.144
49	62.090	2364.145
50	62.717	2437.680
51	63.401	2662.427
52	63.961	2180.880
53	64.480	2019.914
54	65.017	2088.133
55	65.546	2060.549
56	66.071	2044.158
57	66.574	1958.108
58	67.040	1812.998
59	67.506	1811.691
60	67.998	1914.192
61	68.447	1748.564
62	68.884	1699.630



63	69.320	1699.422
64	69.754	1689.979
65	70.177	1643.718
66	70.568	1524.203
67	70.957	1511.168
68	71.353	1542.375
69	71.739	1501.755
70	72.113	1455.404
71	72.487	1455.404
72	72.860	1451.307
73	73.234	1458.492
74	73.603	1435.896
75	73.970	1425.207
76	74.313	1335.326
77	74.620	1197.580
78	74.928	1197.550
79	75.235	1195.234
80	75.535	1168.718
81	75.830	1146.448
82	76.125	1146.448
83	76.403	1084.657
84	76.671	1041.780
85	76.940	1047.006
86	77.217	1076.046
87	77.489	1059.893
88	77.754	1031.655
89	78.020	1033.734
90	78.280	1011.998
91	78.526	959.234
92	78.771	955.077
93	79.017	956.086
94	79.261	951.187
95	79.505	948.604
96	79.748	944.179
97	79.989	937.825
98	80.224	914.249
99	80.437	828.555
100	80.647	818.043
101	80.857	817.449
102	81.066	815.787
103	81.272	801.504
104	81.478	799.752
105	81.684	801.326
106	81.889	796.932
107	82.090	784.460
108	82.285	759.251
109	82.476	742.653
110	82.666	740.515
111	82.857	740.515
112	83.046	737.991
113	83.237	742.860
114	83.427	740.515
115	83.617	740.307
116	83.808	740.247
117	83.996	734.725
118	84.169	671.775
119	84.322	595.197
120	84.472	585.280
121	84.623	587.061
122	84.774	587.863
123	84.925	585.042
124	85.076	587.388
125	85.226	587.507
126	85.377	585.309
127	85.528	587.120
128	85.679	587.596
129	85.829	585.487
130	85.978	580.855

131	86.110	511.849
132	86.235	488.777
133	86.360	484.887
134	86.486	488.985
135	86.610	484.887
136	86.735	486.699
137	86.860	486.996
138	86.985	485.095
139	87.110	485.927
140	87.230	468.586
141	87.349	462.469
142	87.467	459.530
143	87.586	462.261
144	87.704	459.708
145	87.823	464.162
146	87.934	428.738
147	88.039	412.021
148	88.145	412.050
149	88.252	413.683
150	88.356	404.776

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 4008.1753  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1445.7600  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	400.0	800.0	1200.0	1600.0
14.000	390.0815	801.44	.	V	Q	.	.
14.083	395.7279	819.86	.	V	Q	.	.
14.167	401.5135	840.06	.	.V	.Q	.	.
14.250	407.4249	858.34	.	.V	.Q	.	.
14.333	413.4677	877.41	.	.V	.Q	.	.
14.417	419.6436	896.75	.	.V	.Q	.	.
14.500	425.9560	916.55	.	.V	.Q	.	.
14.583	432.4109	937.25	.	.V	.Q	.	.
14.667	439.0111	958.36	.	.V	.Q	.	.
14.750	445.7567	979.46	.	.V	.Q	.	.
14.833	452.6453	1000.23	.	.V	.Q	.	.
14.917	459.6821	1021.74	.	.V	.Q	.	.
15.000	466.8612	1042.42	.	.V	.Q	.	.
15.083	474.1921	1064.45	.	.V	.Q	.	.
15.167	481.6693	1085.69	.	.V	.Q	.	.
15.250	489.2981	1107.69	.	.V	.Q	.	.
15.333	497.0819	1130.22	.	.V	.Q	.	.
15.417	505.0190	1152.46	.	.V	.Q	.	.
15.500	513.0833	1170.94	.	.V	.Q	.	.
15.583	521.2617	1187.50	.	.V	.Q	.	.
15.667	529.5882	1209.01	.	.V	.Q	.	.
15.750	538.0603	1230.15	.	.V	.Q	.	.
15.833	546.6347	1245.00	.	.V	.Q	.	.
15.917	555.3041	1258.80	.	.V	.Q	.	.
16.000	564.0874	1275.33	.	.V	.Q	.	.
16.083	573.1111	1310.24	.	.V	.Q	.	.
16.167	582.3446	1340.71	.	.V	.Q	.	.
16.250	591.6160	1346.21	.	.V	.Q	.	.
16.333	600.9310	1352.53	.	.V	.Q	.	.
16.417	610.3013	1360.57	.	.V	.Q	.	.
16.500	619.8076	1380.32	.	.V	.Q	.	.
16.583	629.4221	1396.02	.	.V	.Q	.	.
16.667	639.0726	1401.27	.	.V	.Q	.	.
16.750	648.7563	1406.08	.	.V	.Q	.	.
16.833	658.4804	1411.93	.	.V	.Q	.	.
16.917	668.3613	1434.71	.	.V	.Q	.	.
17.000	678.2465	1435.33	.	.V	.Q	.	.
17.083	688.2129	1447.12	.	.V	.Q	.	.
17.167	698.1606	1444.40	.	.V	.Q	.	.
17.250	708.2463	1464.46	.	.V	.Q	.	.
17.333	718.4009	1474.44	.	.V	.Q	.	.
17.417	728.6847	1493.21	.	.V	.Q	.	.
17.500	739.0079	1498.93	.	.V	.Q	.	.
17.583	749.3326	1499.14	.	.V	.Q	.	.
17.667	759.9376	1539.84	.	.V	.Q	.	.
17.750	770.5797	1545.23	.	.V	.Q	.	.
17.833	781.0287	1517.20	.	.V	.Q	.	.
17.917	791.4230	1509.24	.	.V	.Q	.	.
18.000	801.7949	1506.00	.	.V	.Q	.	.
18.083	812.2180	1513.43	.	.V	.Q	.	.
18.167	822.5672	1502.71	.	.V	.Q	.	.
18.250	832.7593	1479.89	.	.V	.Q	.	.
18.333	842.9907	1485.61	.	.V	.Q	.	.
18.417	853.1938	1481.49	.	.V	.Q	.	.
18.500	863.2916	1466.21	.	.V	.Q	.	.
18.583	873.3080	1454.38	.	.V	.Q	.	.

18.667	883.2809	1448.08	.	.	.	.	V	.	Q	.
18.750	893.1216	1428.86	.	.	.	.	V	.	Q	.
18.833	902.8395	1411.04	.	.	.	.	V	.	Q	.
18.917	912.3593	1382.27	.	.	.	.	V	.	Q	.
19.000	921.7413	1362.27	.	.	.	.	V	.	Q	.
19.083	930.9716	1340.25	.	.	.	.	V	.	Q	.
19.167	940.0760	1321.97	.	.	.	.	V	.	Q	.
19.250	949.0126	1297.59	.	.	.	.	V	.	Q	.
19.333	957.8273	1279.90	.	.	.	.	V	.	Q	.
19.417	966.5709	1269.56	.	.	.	.	V	.	Q	.
19.500	975.0755	1234.88	.	.	.	.	V	.	Q	.
19.583	983.3845	1206.47	.	.	.	.	V	.	Q	.
19.667	991.5424	1184.52	.	.	.	.	V	.	Q	.
19.750	999.5418	1161.51	.	.	.	.	V	.	Q	.
19.833	1007.3841	1138.70	.	.	.	.	V	.	Q	.
19.917	1015.0818	1117.71	.	.	.	.	V	.	Q	.
20.000	1022.6536	1099.43	.	.	.	.	V	.	Q	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

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 FILE NAME: LU62002E.FLD  
 TIME/DATE OF STUDY: 13:24 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1062.00 IS CODE = 1

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 >>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<<  
 =====

(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 46437.301 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 3.060 HOURS  
 VALLEY(DEVELOPED):  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.010  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.150  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.640  
 VALLEY(UNDEVELOPED)/DESERT:  
   "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.200  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.590  
 LOW LOSS FRACTION = 0.730  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.16  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.30  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.42  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.78  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.16  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.06

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.357  
 30-MINUTE FACTOR = 0.406  
 1-HOUR FACTOR = 0.444  
 3-HOUR FACTOR = 0.794  
 6-HOUR FACTOR = 0.908  
 24-HOUR FACTOR = 0.946

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.723

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.267	1500.343
2	0.801	3000.689
3	1.336	3000.687
4	1.868	2987.546
5	2.396	2966.794
6	2.970	3225.431
7	3.743	4338.359
8	4.532	4433.588
9	5.332	4490.636
10	6.159	4645.647
11	7.020	4835.857
12	8.108	6107.268
13	9.150	5855.932
14	10.438	7230.890
15	11.677	6959.862
16	13.071	7827.868
17	14.586	8509.919
18	16.225	9203.442
19	18.122	10650.174
20	19.815	9511.778
21	21.632	10201.193
22	23.902	12751.637
23	26.101	12346.370
24	27.979	10546.892
25	29.713	9737.484
26	31.390	9419.068
27	33.142	9839.577
28	34.931	10049.023
29	36.390	8191.552
30	37.927	8633.645
31	39.668	9776.711
32	41.239	8820.692
33	42.856	9085.121
34	44.420	8780.502
35	46.351	10846.123
36	48.039	9479.396
37	49.659	9098.746
38	50.963	7321.548
39	52.139	6602.944
40	53.235	6158.815
41	54.304	5999.726
42	55.230	5202.304
43	56.029	4486.528
44	57.024	5590.282
45	57.961	5258.776
46	58.659	3920.265
47	59.348	3870.605
48	60.032	3841.255
49	60.709	3805.393
50	61.390	3819.896
51	62.075	3848.625
52	62.793	4035.351
53	63.364	3205.002
54	63.944	3255.926
55	64.645	3935.625
56	65.243	3357.515
57	65.708	2614.638
58	66.228	2922.106
59	66.752	2938.646
60	67.263	2869.105
61	67.799	3015.255
62	68.289	2747.849

63	68.734	2499.166
64	69.179	2499.166
65	69.651	2653.329
66	70.069	2346.589
67	70.482	2319.724
68	70.895	2320.495
69	71.306	2308.455
70	71.712	2277.948
71	72.096	2158.149
72	72.471	2103.733
73	72.844	2096.321
74	73.238	2212.050
75	73.597	2017.526
76	73.946	1957.026
77	74.294	1955.826
78	74.642	1953.555
79	74.993	1970.865
80	75.336	1926.648
81	75.671	1881.916
82	76.001	1852.780
83	76.299	1673.723
84	76.594	1656.113
85	76.888	1652.000
86	77.180	1639.232
87	77.457	1554.052
88	77.729	1531.858
89	78.001	1526.930
90	78.258	1443.379
91	78.506	1392.863
92	78.754	1392.520
93	79.016	1469.430
94	79.277	1468.744
95	79.522	1374.267
96	79.765	1366.469
97	80.008	1364.841
98	80.241	1305.669
99	80.468	1276.191
100	80.695	1274.734
101	80.922	1273.877
102	81.147	1265.308
103	81.371	1255.282
104	81.593	1246.370
105	81.813	1236.943
106	82.028	1205.365
107	82.227	1122.071
108	82.422	1091.778
109	82.615	1087.751
110	82.810	1092.850
111	83.001	1072.540
112	83.187	1041.733
113	83.372	1041.091
114	83.558	1045.333
115	83.742	1035.478
116	83.922	1006.942
117	84.097	984.233
118	84.268	958.525
119	84.438	959.039
120	84.609	959.253
121	84.781	962.510
122	84.951	954.497
123	85.122	961.867
124	85.293	959.039
125	85.463	959.296
126	85.634	959.082
127	85.801	938.387
128	85.954	857.921
129	86.090	763.015
130	86.223	745.319

131	86.356	746.476
132	86.488	744.720
133	86.621	744.548
134	86.754	747.890
135	86.887	744.720
136	87.019	743.948
137	87.152	745.362
138	87.284	743.906
139	87.417	747.890
140	87.550	744.720
141	87.682	739.364
142	87.801	669.823
143	87.913	629.548
144	88.024	624.149
145	88.134	619.521
146	88.245	622.949
147	88.356	623.506
148	88.467	622.135
149	88.578	620.978
150	88.689	622.906

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 5504.9863  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1804.8489  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	475.0	950.0	1425.0	1900.0
14.000	475.8846	967.67	.	V	Q	.	.
14.083	482.6977	989.26	.	V	Q	.	.
14.167	489.6727	1012.77	.	V	.Q	.	.
14.250	496.8133	1036.82	.	.V	.Q	.	.
14.333	504.1211	1061.09	.	.V	.Q	.	.
14.417	511.5795	1082.96	.	.V	.Q	.	.
14.500	519.1950	1105.77	.	.V	.Q	.	.
14.583	526.9891	1131.71	.	.V	.Q	.	.
14.667	534.9539	1156.49	.	.V	.Q	.	.
14.750	543.0917	1181.60	.	.V	.Q	.	.
14.833	551.4008	1206.48	.	.V	.Q	.	.
14.917	559.9005	1234.15	.	.V	.Q	.	.
15.000	568.5911	1261.88	.	.V	.Q	.	.
15.083	577.4655	1288.56	.	.V	.Q	.	.
15.167	586.5208	1314.83	.	.V	.Q	.	.
15.250	595.7463	1339.55	.	.V	.Q	.	.
15.333	605.1450	1364.70	.	.V	.Q	.	.
15.417	614.7007	1387.49	.	.V	.Q	.	.
15.500	624.3920	1407.18	.	.V	.Q	.	.
15.583	634.2295	1428.40	.	.V	.Q	.	.
15.667	644.2123	1449.50	.	.V	.Q	.	.
15.750	654.3374	1470.17	.	.V	.Q	.	.
15.833	664.6095	1491.51	.	.V	.Q	.	.
15.917	675.0208	1511.71	.	.V	.Q	.	.
16.000	685.5744	1532.39	.	.V	.Q	.	.
16.083	696.3807	1569.08	.	.V	.Q	.	.
16.167	707.4100	1601.46	.	.V	.Q	.	.
16.250	718.5323	1614.95	.	.V	.Q	.	.
16.333	729.7311	1626.06	.	.V	.Q	.	.
16.417	741.0070	1637.26	.	.V	.Q	.	.
16.500	752.3962	1653.72	.	.V	.Q	.	.
16.583	763.9797	1681.93	.	.V	.Q	.	.
16.667	775.6405	1693.15	.	.V	.Q	.	.
16.750	787.3696	1703.07	.	.V	.Q	.	.
16.833	799.1688	1713.24	.	.V	.Q	.	.
16.917	811.0706	1728.13	.	.V	.Q	.	.
17.000	823.1561	1754.81	.	.V	.Q	.	.
17.083	835.2847	1761.08	.	.V	.Q	.	.
17.167	847.5076	1774.76	.	.V	.Q	.	.
17.250	859.6927	1769.27	.	.V	.Q	.	.
17.333	871.9858	1784.95	.	.V	.Q	.	.
17.417	884.3778	1799.33	.	.V	.Q	.	.
17.500	896.8600	1812.41	.	.V	.Q	.	.
17.583	909.4434	1827.12	.	.V	.Q	.	.
17.667	921.9758	1819.71	.	.V	.Q	.	.
17.750	934.6518	1840.55	.	.V	.Q	.	.
17.833	947.5555	1873.63	.	.V	.Q	.	.
17.917	960.4177	1867.59	.	.V	.Q	.	.
18.000	973.1227	1844.77	.	.V	.Q	.	.
18.083	985.7620	1835.21	.	.V	.Q	.	.
18.167	998.3906	1833.67	.	.V	.Q	.	.
18.250	1011.0218	1834.06	.	.V	.Q	.	.
18.333	1023.6212	1829.43	.	.V	.Q	.	.
18.417	1036.0325	1802.12	.	.V	.Q	.	.
18.500	1048.4574	1804.10	.	.V	.Q	.	.
18.583	1060.9108	1808.24	.	.V	.Q	.	.

18.667	1073.2522	1791.97	.	.	.	V	.	Q	Q	.
18.750	1085.5508	1785.75	.	.	.	V	.	.	Q	.
18.833	1097.7610	1772.92	.	.	.	V	.	.	Q	.
18.917	1110.0591	1785.69	.	.	.	V	.	.	Q	.
19.000	1122.1317	1752.95	.	.	.	V	.	.	Q	.
19.083	1134.0637	1732.53	.	.	.	V	.	.	Q	.
19.167	1145.7499	1696.84	.	.	.	V	.	.	Q	.
19.250	1157.3083	1678.29	.	.	.	V	.	.	Q	.
19.333	1168.7245	1657.62	.	.	.	V	.	.	Q	.
19.417	1180.0280	1641.26	.	.	.	V	.	.	Q	.
19.500	1191.1476	1614.57	.	.	.	V	.	.	Q	.
19.583	1202.0703	1585.98	.	.	.	V	.	.	Q	.
19.667	1212.9294	1576.75	.	.	.	V	.	.	Q	.
19.750	1223.5957	1548.74	.	.	.	V	.	.	Q	.
19.833	1233.9727	1506.73	.	.	.	V	.	.	Q	.
19.917	1244.1232	1473.86	.	.	.	V	.	.	Q	.
20.000	1254.0946	1447.85	.	.	.	V	.	.	Q	.

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END OF FLOODSCx ROUTING ANALYSIS

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**PRELIMINARY DRAFT – FOR INTERNAL USE ONLY**

**TECHNICAL APPENDIX I-A  
HYDROLOGIC ANALYSIS  
UPSTREAM AREAS  
10-YEAR EXPECTED VALUE**

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

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714 - 734 - 5100

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FILE NAME: LU35010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.000  
FOOTHILL 0.030  
MOUNTAIN 0.920  
VALLEY(UNDEVELOPED)/DESERT 0.050  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1000.00 TO NODE 1001.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00  
ELEVATION DATA: UPSTREAM(FEET) = 3210.00 DOWNSTREAM(FEET) = 3190.00  
  
 $T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$   
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.581  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.392  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1.30 0.25 1.00 75 12.58  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA RUNOFF(CFS) = 2.51  
TOTAL AREA(ACRES) = 1.30 PEAK FLOW RATE(CFS) = 2.51

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1001.00 TO NODE 1002.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3190.00 DOWNSTREAM(FEET) = 3175.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 154.00 CHANNEL SLOPE = 0.0974  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 2.51  
FLOW VELOCITY(FEET/SEC.) = 3.98 FLOW DEPTH(FEET) = 0.44  
TRAVEL TIME(MIN.) = 0.64 Tc(MIN.) = 13.23  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1002.00 = 484.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1001.00 TO NODE 1002.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 13.23  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.713  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1.20 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1.20 SUBAREA RUNOFF(CFS) = 2.66  
EFFECTIVE AREA(ACRES) = 2.50 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2.50 PEAK FLOW RATE(CFS) = 5.54

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1002.00 TO NODE 1003.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3175.00 DOWNSTREAM(FEET) = 3160.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 136.00 CHANNEL SLOPE = 0.1103  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000

MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 5.54  
FLOW VELOCITY(FEET/SEC.) = 5.15 FLOW DEPTH(FEET) = 0.65  
TRAVEL TIME(MIN.) = 0.44 Tc(MIN.) = 13.67  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1003.00 = 620.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1002.00 TO NODE 1003.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 13.67  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.660  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 0.30 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 2.10 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 2.40 SUBAREA RUNOFF(CFS) = 5.19  
EFFECTIVE AREA(ACRES) = 4.90 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4.90 PEAK FLOW RATE(CFS) = 10.62

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1003.00 TO NODE 1004.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3160.00 DOWNSTREAM(FEET) = 3120.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 357.00 CHANNEL SLOPE = 0.1120  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 10.62  
FLOW VELOCITY(FEET/SEC.) = 5.95 FLOW DEPTH(FEET) = 0.67  
TRAVEL TIME(MIN.) = 1.00 Tc(MIN.) = 14.67  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1004.00 = 977.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1003.00 TO NODE 1004.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 14.67  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.540  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 0.10 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 3.20 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 3.30 SUBAREA RUNOFF(CFS) = 6.80  
EFFECTIVE AREA(ACRES) = 8.20 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 8.20 PEAK FLOW RATE(CFS) = 16.88

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1004.00 TO NODE 1005.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3120.00 DOWNSTREAM(FEET) = 3100.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 332.00 CHANNEL SLOPE = 0.0602  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 16.88  
FLOW VELOCITY(FEET/SEC.) = 5.39 FLOW DEPTH(FEET) = 1.03  
TRAVEL TIME(MIN.) = 1.03 Tc(MIN.) = 15.69  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1005.00 = 1309.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1004.00 TO NODE 1005.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 15.69  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.403  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 5.50 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 5.50 SUBAREA RUNOFF(CFS) = 10.66  
EFFECTIVE AREA(ACRES) = 13.70 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 13.70 PEAK FLOW RATE(CFS) = 26.53

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1005.00 TO NODE 1006.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3100.00 DOWNSTREAM(FEET) = 3080.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 195.00 CHANNEL SLOPE = 0.1026  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 26.53  
FLOW VELOCITY(FEET/SEC.) = 7.40 FLOW DEPTH(FEET) = 1.14  
TRAVEL TIME(MIN.) = 0.44 Tc(MIN.) = 16.13  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1006.00 = 1504.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1005.00 TO NODE 1006.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 16.13  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.342  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 7.80 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 7.80 SUBAREA RUNOFF(CFS) = 14.68



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EFFECTIVE AREA(ACRES) = 21.50 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 21.50 PEAK FLOW RATE(CFS) = 40.46

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

*****
FLOW PROCESS FROM NODE 1006.00 TO NODE 1007.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3080.00 DOWNSTREAM(FEET) = 3075.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 220.00 CHANNEL SLOPE = 0.0227
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00
CHANNEL FLOW THRU SUBAREA(CFS) = 40.46
FLOW VELOCITY(FEET/SEC.) = 4.69 FLOW DEPTH(FEET) = 1.80
TRAVEL TIME(MIN.) = 0.78 Tc(MIN.) = 16.91
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1007.00 = 1724.00 FEET.

*****
FLOW PROCESS FROM NODE 1006.00 TO NODE 1007.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 16.91
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.232
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 10.10 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 10.10 SUBAREA RUNOFF(CFS) = 18.02
EFFECTIVE AREA(ACRES) = 31.60 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 31.60 PEAK FLOW RATE(CFS) = 56.36

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

*****
FLOW PROCESS FROM NODE 1007.00 TO NODE 1008.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3075.00 DOWNSTREAM(FEET) = 3060.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 340.00 CHANNEL SLOPE = 0.0441
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00
CHANNEL FLOW THRU SUBAREA(CFS) = 56.36
FLOW VELOCITY(FEET/SEC.) = 6.53 FLOW DEPTH(FEET) = 1.80
TRAVEL TIME(MIN.) = 0.87 Tc(MIN.) = 17.78
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1008.00 = 2064.00 FEET.

*****
FLOW PROCESS FROM NODE 1007.00 TO NODE 1008.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 17.78
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.111
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

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LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B 14.60 0.30 1.00 63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 4.60 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.29
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 19.20 SUBAREA RUNOFF(CFS) = 31.50
EFFECTIVE AREA(ACRES) = 50.80 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 50.80 PEAK FLOW RATE(CFS) = 84.40

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

*****
FLOW PROCESS FROM NODE 1008.00 TO NODE 1009.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3060.00 DOWNSTREAM(FEET) = 3040.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 409.00 CHANNEL SLOPE = 0.0489
CHANNEL BASE(FEET) = 4.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 4.00
CHANNEL FLOW THRU SUBAREA(CFS) = 84.40
FLOW VELOCITY(FEET/SEC.) = 7.44 FLOW DEPTH(FEET) = 1.92
TRAVEL TIME(MIN.) = 0.92 Tc(MIN.) = 18.70
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1009.00 = 2473.00 FEET.

*****
FLOW PROCESS FROM NODE 1008.00 TO NODE 1009.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 18.70
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.982
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B 9.60 0.30 1.00 63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 22.90 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 32.50 SUBAREA RUNOFF(CFS) = 50.24
EFFECTIVE AREA(ACRES) = 83.30 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 83.30 PEAK FLOW RATE(CFS) = 128.78

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

*****
FLOW PROCESS FROM NODE 1009.00 TO NODE 1010.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3040.00 DOWNSTREAM(FEET) = 3000.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1354.00 CHANNEL SLOPE = 0.0295
CHANNEL BASE(FEET) = 5.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 5.00
CHANNEL FLOW THRU SUBAREA(CFS) = 128.78
FLOW VELOCITY(FEET/SEC.) = 6.85 FLOW DEPTH(FEET) = 2.51
TRAVEL TIME(MIN.) = 3.29 Tc(MIN.) = 21.99
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1010.00 = 3827.00 FEET.

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*****
FLOW PROCESS FROM NODE 1009.00 TO NODE 1010.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 21.99
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.710
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  B      22.50   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  C      20.80   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.28
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 43.30   SUBAREA RUNOFF(CFS) = 55.90
EFFECTIVE AREA(ACRES) = 126.60   AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27   AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 126.60   PEAK FLOW RATE(CFS) = 164.28

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

*****
FLOW PROCESS FROM NODE 1010.00 TO NODE 1011.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3000.00   DOWNSTREAM(FEET) = 2960.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1293.00   CHANNEL SLOPE = 0.0309
CHANNEL BASE(FEET) = 5.00   "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) = 5.00
CHANNEL FLOW THRU SUBAREA(CFS) = 164.28
FLOW VELOCITY(FEET/SEC.) = 7.45   FLOW DEPTH(FEET) = 2.82
TRAVEL TIME(MIN.) = 2.89   Tc(MIN.) = 24.88
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1011.00 = 5120.00 FEET.

*****
FLOW PROCESS FROM NODE 1010.00 TO NODE 1011.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 24.88
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.580
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  B      24.80   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  C      52.80   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 77.60   SUBAREA RUNOFF(CFS) = 91.79
EFFECTIVE AREA(ACRES) = 204.20   AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27   AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 204.20   PEAK FLOW RATE(CFS) = 241.23

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

*****
FLOW PROCESS FROM NODE 1011.00 TO NODE 1012.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

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>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2960.00   DOWNSTREAM(FEET) = 2940.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 900.00   CHANNEL SLOPE = 0.0222
CHANNEL BASE(FEET) = 6.00   "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) = 6.00
CHANNEL FLOW THRU SUBAREA(CFS) = 241.23
FLOW VELOCITY(FEET/SEC.) = 7.24   FLOW DEPTH(FEET) = 3.50
TRAVEL TIME(MIN.) = 2.07   Tc(MIN.) = 26.96
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1012.00 = 6020.00 FEET.

*****
FLOW PROCESS FROM NODE 1011.00 TO NODE 1012.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 26.96
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.487
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  B      10.90   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  C      15.10   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 26.00   SUBAREA RUNOFF(CFS) = 28.46
EFFECTIVE AREA(ACRES) = 230.20   AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27   AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 230.20   PEAK FLOW RATE(CFS) = 252.55

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

*****
FLOW PROCESS FROM NODE 1012.00 TO NODE 1013.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2940.00   DOWNSTREAM(FEET) = 2920.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 830.00   CHANNEL SLOPE = 0.0241
CHANNEL BASE(FEET) = 6.00   "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) = 6.00
CHANNEL FLOW THRU SUBAREA(CFS) = 252.55
FLOW VELOCITY(FEET/SEC.) = 7.56   FLOW DEPTH(FEET) = 3.51
TRAVEL TIME(MIN.) = 1.83   Tc(MIN.) = 28.79
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1013.00 = 6850.00 FEET.

*****
FLOW PROCESS FROM NODE 1012.00 TO NODE 1013.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 28.79
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.405
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  B      3.20   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  C      21.50   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 24.70   SUBAREA RUNOFF(CFS) = 25.52
EFFECTIVE AREA(ACRES) = 254.90   AREA-AVERAGED Fm(INCH/HR) = 0.27

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AREA-AVERAGED Fp(INCH/HR) = 0.27  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 254.90  PEAK FLOW RATE(CFS) = 261.02

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

*****
FLOW PROCESS FROM NODE 1013.00 TO NODE 1014.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2920.00  DOWNSTREAM(FEET) = 2905.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 564.00  CHANNEL SLOPE = 0.0266
CHANNEL BASE(FEET) = 6.00  "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050  MAXIMUM DEPTH(FEET) = 6.00
CHANNEL FLOW THRU SUBAREA(CFS) = 261.02
FLOW VELOCITY(FEET/SEC.) = 7.91  FLOW DEPTH(FEET) = 3.48
TRAVEL TIME(MIN.) = 1.19  Tc(MIN.) = 29.97
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1014.00 = 7414.00 FEET.

*****
FLOW PROCESS FROM NODE 1013.00 TO NODE 1014.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 29.97
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.351
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"   B       79.00   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"   C        2.90   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 81.90  SUBAREA RUNOFF(CFS) = 77.61
EFFECTIVE AREA(ACRES) = 336.80  AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 336.80  PEAK FLOW RATE(CFS) = 326.35

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

*****
FLOW PROCESS FROM NODE 1014.00 TO NODE 1015.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2905.00  DOWNSTREAM(FEET) = 2880.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 901.00  CHANNEL SLOPE = 0.0277
CHANNEL BASE(FEET) = 7.00  "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050  MAXIMUM DEPTH(FEET) = 7.00
CHANNEL FLOW THRU SUBAREA(CFS) = 326.35
FLOW VELOCITY(FEET/SEC.) = 8.46  FLOW DEPTH(FEET) = 3.63
TRAVEL TIME(MIN.) = 1.77  Tc(MIN.) = 31.75
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1015.00 = 8315.00 FEET.

*****
FLOW PROCESS FROM NODE 1014.00 TO NODE 1015.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 31.75
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.330
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"   B       1.80   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"   C      14.10   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 15.90  SUBAREA RUNOFF(CFS) = 15.37
EFFECTIVE AREA(ACRES) = 352.70  AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 352.70  PEAK FLOW RATE(CFS) = 335.19

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

*****
FLOW PROCESS FROM NODE 1015.00 TO NODE 1035.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 2880.00  DOWNSTREAM(FEET) = 2840.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1895.00  CHANNEL SLOPE = 0.0211
CHANNEL BASE(FEET) = 7.00  "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050  MAXIMUM DEPTH(FEET) = 7.00
CHANNEL FLOW THRU SUBAREA(CFS) = 335.19
FLOW VELOCITY(FEET/SEC.) = 7.71  FLOW DEPTH(FEET) = 3.96
TRAVEL TIME(MIN.) = 4.10  Tc(MIN.) = 35.85
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

*****
FLOW PROCESS FROM NODE 1015.00 TO NODE 1035.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 35.85
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.282
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE           GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"   B       8.00   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"   C      28.80   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 36.80  SUBAREA RUNOFF(CFS) = 33.81
EFFECTIVE AREA(ACRES) = 389.50  AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27  AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 389.50  PEAK FLOW RATE(CFS) = 353.83

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

*****
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 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.) = 35.85
RAINFALL INTENSITY(INCH/HR) = 1.28
AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 389.50

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TOTAL STREAM AREA(ACRES) = 389.50  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 353.83

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1020.00 TO NODE 1021.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00  
ELEVATION DATA: UPSTREAM(FEET) = 3525.00 DOWNSTREAM(FEET) = 3485.00  
  
Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.952  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.986  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 0.70 0.30 1.00 63 10.95  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.30 0.20 1.00 81 10.95  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA RUNOFF(CFS) = 2.44  
TOTAL AREA(ACRES) = 1.00 PEAK FLOW RATE(CFS) = 2.44

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1021.00 TO NODE 1022.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3485.00 DOWNSTREAM(FEET) = 3440.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 191.00 CHANNEL SLOPE = 0.2356  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 2.44  
FLOW VELOCITY(FEET/SEC.) = 5.39 FLOW DEPTH(FEET) = 0.34  
TRAVEL TIME(MIN.) = 0.59 Tc(MIN.) = 11.54  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1022.00 = 521.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1021.00 TO NODE 1022.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 11.54  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.915  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 0.10 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.80 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 0.90 SUBAREA RUNOFF(CFS) = 2.19  
EFFECTIVE AREA(ACRES) = 1.90 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1.90 PEAK FLOW RATE(CFS) = 4.57

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1022.00 TO NODE 1023.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3440.00 DOWNSTREAM(FEET) = 3400.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 227.00 CHANNEL SLOPE = 0.1762  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 4.57  
FLOW VELOCITY(FEET/SEC.) = 5.84 FLOW DEPTH(FEET) = 0.52  
TRAVEL TIME(MIN.) = 0.65 Tc(MIN.) = 12.19  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1023.00 = 748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1022.00 TO NODE 1023.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 12.19  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.837  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 1.20 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1.20 SUBAREA RUNOFF(CFS) = 2.85  
EFFECTIVE AREA(ACRES) = 3.10 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3.10 PEAK FLOW RATE(CFS) = 7.29

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1023.00 TO NODE 1024.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3400.00 DOWNSTREAM(FEET) = 3280.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 160.00 CHANNEL SLOPE = 0.7500  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 7.29  
FLOW VELOCITY(FEET/SEC.) = 11.26 FLOW DEPTH(FEET) = 0.45  
TRAVEL TIME(MIN.) = 0.24 Tc(MIN.) = 12.43  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1024.00 = 908.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1023.00 TO NODE 1024.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 12.43  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.809  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 0.10 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.60 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 0.70 SUBAREA RUNOFF(CFS) = 1.64  
EFFECTIVE AREA(ACRES) = 3.80 AREA-AVERAGED Fm(INCH/HR) = 0.22  
AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3.80 PEAK FLOW RATE(CFS) = 8.85

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*

FLOW PROCESS FROM NODE 1024.00 TO NODE 1025.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3280.00 DOWNSTREAM(FEET) = 3240.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 138.00 CHANNEL SLOPE = 0.2899  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 8.85  
FLOW VELOCITY(FEET/SEC.) = 8.33 FLOW DEPTH(FEET) = 0.65  
TRAVEL TIME(MIN.) = 0.28 Tc(MIN.) = 12.70  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1025.00 = 1046.00 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 1024.00 TO NODE 1025.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 12.70  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.776  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 2.80 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.30 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 3.10 SUBAREA RUNOFF(CFS) = 7.06  
EFFECTIVE AREA(ACRES) = 6.90 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.90 PEAK FLOW RATE(CFS) = 15.79

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*

FLOW PROCESS FROM NODE 1025.00 TO NODE 1026.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3240.00 DOWNSTREAM(FEET) = 3200.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 200.00 CHANNEL SLOPE = 0.2000  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 15.79  
FLOW VELOCITY(FEET/SEC.) = 8.17 FLOW DEPTH(FEET) = 0.71  
TRAVEL TIME(MIN.) = 0.41 Tc(MIN.) = 13.11  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1026.00 = 1246.00 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 1025.00 TO NODE 1026.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 13.11  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.727

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1.50 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 1.80 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 3.30 SUBAREA RUNOFF(CFS) = 7.44  
EFFECTIVE AREA(ACRES) = 10.20 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 10.20 PEAK FLOW RATE(CFS) = 22.93

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*

FLOW PROCESS FROM NODE 1026.00 TO NODE 1027.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3200.00 DOWNSTREAM(FEET) = 3120.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 477.00 CHANNEL SLOPE = 0.1677  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 22.93  
FLOW VELOCITY(FEET/SEC.) = 8.53 FLOW DEPTH(FEET) = 0.92  
TRAVEL TIME(MIN.) = 0.93 Tc(MIN.) = 14.04  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1027.00 = 1723.00 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 1026.00 TO NODE 1027.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 14.04  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.615  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 3.90 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 3.10 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 7.00 SUBAREA RUNOFF(CFS) = 15.04  
EFFECTIVE AREA(ACRES) = 17.20 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 17.20 PEAK FLOW RATE(CFS) = 36.94

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*

FLOW PROCESS FROM NODE 1027.00 TO NODE 1028.00 IS CODE = 51

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

ELEVATION DATA: UPSTREAM(FEET) = 3120.00 DOWNSTREAM(FEET) = 3100.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 273.00 CHANNEL SLOPE = 0.0733  
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00

CHANNEL FLOW THRU SUBAREA(CFS) = 36.94  
FLOW VELOCITY(FEET/SEC.) = 6.98 FLOW DEPTH(FEET) = 1.25  
TRAVEL TIME(MIN.) = 0.65 Tc(MIN.) = 14.69  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1028.00 = 1996.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1027.00 TO NODE 1028.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 14.69  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.537  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 2.70 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.50 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 3.20 SUBAREA RUNOFF(CFS) = 6.61  
EFFECTIVE AREA(ACRES) = 20.40 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 20.40 PEAK FLOW RATE(CFS) = 42.33

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1028.00 TO NODE 1029.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----  
ELEVATION DATA: UPSTREAM(FEET) = 3100.00 DOWNSTREAM(FEET) = 3080.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 212.00 CHANNEL SLOPE = 0.0943  
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 42.33  
FLOW VELOCITY(FEET/SEC.) = 7.94 FLOW DEPTH(FEET) = 1.25  
TRAVEL TIME(MIN.) = 0.45 Tc(MIN.) = 15.14  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1029.00 = 2208.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1028.00 TO NODE 1029.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 15.14  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.480  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 4.60 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 4.40 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 8.70 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 17.70 SUBAREA RUNOFF(CFS) = 35.71  
EFFECTIVE AREA(ACRES) = 38.10 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 38.10 PEAK FLOW RATE(CFS) = 77.02

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1029.00 TO NODE 1030.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3080.00 DOWNSTREAM(FEET) = 3000.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 781.00 CHANNEL SLOPE = 0.1024  
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 77.02  
FLOW VELOCITY(FEET/SEC.) = 9.65 FLOW DEPTH(FEET) = 1.70  
TRAVEL TIME(MIN.) = 1.35 Tc(MIN.) = 16.49  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1030.00 = 2989.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1029.00 TO NODE 1030.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 16.49  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.292  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 24.90 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 6.60 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 31.50 SUBAREA RUNOFF(CFS) = 58.17  
EFFECTIVE AREA(ACRES) = 69.60 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 69.60 PEAK FLOW RATE(CFS) = 128.71

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1030.00 TO NODE 1031.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3000.00 DOWNSTREAM(FEET) = 2980.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 392.00 CHANNEL SLOPE = 0.0510  
CHANNEL BASE(FEET) = 4.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 4.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 128.71  
FLOW VELOCITY(FEET/SEC.) = 8.46 FLOW DEPTH(FEET) = 2.38  
TRAVEL TIME(MIN.) = 0.77 Tc(MIN.) = 17.26  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1031.00 = 3381.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1030.00 TO NODE 1031.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 17.26  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.183  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 53.50 0.25 1.00 75

NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 2.40 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 55.90 SUBAREA RUNOFF(CFS) = 97.38  
EFFECTIVE AREA(ACRES) = 125.50 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 125.50 PEAK FLOW RATE(CFS) = 219.32

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1031.00 TO NODE 1032.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2980.00 DOWNSTREAM(FEET) = 2920.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1552.00 CHANNEL SLOPE = 0.0387  
CHANNEL BASE(FEET) = 5.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 5.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 219.32  
FLOW VELOCITY(FEET/SEC.) = 8.73 FLOW DEPTH(FEET) = 3.10  
TRAVEL TIME(MIN.) = 2.96 Tc(MIN.) = 20.23  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1032.00 = 4933.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1031.00 TO NODE 1032.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 20.23  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.790  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 65.60 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 44.00 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 109.60 SUBAREA RUNOFF(CFS) = 153.87  
EFFECTIVE AREA(ACRES) = 235.10 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 235.10 PEAK FLOW RATE(CFS) = 328.74

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1032.00 TO NODE 1033.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2920.00 DOWNSTREAM(FEET) = 2900.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 976.00 CHANNEL SLOPE = 0.0205  
CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 328.74  
FLOW VELOCITY(FEET/SEC.) = 7.59 FLOW DEPTH(FEET) = 3.95  
TRAVEL TIME(MIN.) = 2.14 Tc(MIN.) = 22.37  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1033.00 = 5909.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1032.00 TO NODE 1033.00 IS CODE = 81  
-----

-----  
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 22.37  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.693  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 35.60 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.60 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 36.20 SUBAREA RUNOFF(CFS) = 47.05  
EFFECTIVE AREA(ACRES) = 271.30 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 271.30 PEAK FLOW RATE(CFS) = 355.38

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1033.00 TO NODE 1034.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2900.00 DOWNSTREAM(FEET) = 2880.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 942.00 CHANNEL SLOPE = 0.0212  
CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 355.38  
FLOW VELOCITY(FEET/SEC.) = 7.85 FLOW DEPTH(FEET) = 4.08  
TRAVEL TIME(MIN.) = 2.00 Tc(MIN.) = 24.37  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1034.00 = 6851.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1033.00 TO NODE 1034.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 24.37  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.603  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 30.50 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 1.20 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 31.70 SUBAREA RUNOFF(CFS) = 38.67  
EFFECTIVE AREA(ACRES) = 303.00 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 303.00 PEAK FLOW RATE(CFS) = 372.06

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1034.00 TO NODE 1035.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 2880.00 DOWNSTREAM(FEET) = 2840.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 1097.00 CHANNEL SLOPE = 0.0365  
 CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000  
 MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 372.06  
 FLOW VELOCITY(FEET/SEC.) = 9.68 FLOW DEPTH(FEET) = 3.62  
 TRAVEL TIME(MIN.) = 1.89 Tc(MIN.) = 26.26  
 LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1035.00 = 7948.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1034.00 TO NODE 1035.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
 MAINLINE Tc(MIN) = 26.26  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.518  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	1.20	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	113.90	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	18.60	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 133.70 SUBAREA RUNOFF(CFS) = 153.41  
 EFFECTIVE AREA(ACRES) = 436.70 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 436.70 PEAK FLOW RATE(CFS) = 502.29

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 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.) = 26.26  
 RAINFALL INTENSITY(INCH/HR) = 1.52  
 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.24  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 436.70  
 TOTAL STREAM AREA(ACRES) = 436.70  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 502.29

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	353.83	35.85	1.282	0.27( 0.27)	1.00	389.5	1000.00
2	502.29	26.26	1.518	0.24( 0.24)	1.00	436.7	1020.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	822.24	26.26	1.518	0.25( 0.25)	1.00	722.0	1020.00
2	763.15	35.85	1.282	0.26( 0.26)	1.00	826.2	1000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 822.24 Tc(MIN.) = 26.26

EFFECTIVE AREA(ACRES) = 722.03 AREA-AVERAGED Fm(INCH/HR) = 0.25  
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 826.20  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 7  
 -----

>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<<<<<  
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<<<<<

-----  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.99;3H= 2.01;6H= 3.14;24H= 5.71  
 S-GRAPH: VALLEY(DEV.)= 0.0%;VALLEY(UNDEV.)/DESERT= 5.0%  
 MOUNTAIN= 92.0%;FOOTHILL= 3.0%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.26; Ybar = 0.50  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;  
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 826.20  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0517; Lca/L=0.4,n=.0464; Lca/L=0.5,n=.0426;Lca/L=0.6,n=.0398  
 TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 214.20  
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) = 739.10  
 TOTAL PEAK FLOW RATE(CFS) = 739.10 (SOURCE FLOW INCLUDED)  
 RATIONAL METHOD PEAK FLOW RATE(CFS) = 822.24  
 (UPSTREAM NODE PEAK FLOW RATE(CFS) = 822.24)  
 PEAK FLOW RATE(CFS) USED = 822.24

-----  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 826.20 TC(MIN.) = 35.85  
 AREA-AVERAGED Fm(INCH/HR)= 0.26 Ybar = 0.50  
 PEAK FLOW RATE(CFS) = 822.24  
 -----

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU36010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.170  
FOOTHILL 0.030  
MOUNTAIN 0.750  
VALLEY(UNDEVELOPED)/DESERT 0.050  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU35010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 822.24 Tc(MIN.) = 35.85  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.50  
TOTAL AREA(ACRES) = 826.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 822.24 Tc(MIN.) = 35.85  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.50  
TOTAL AREA(ACRES) = 826.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1036.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2840.00 DOWNSTREAM(FEET) = 2800.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1878.00 CHANNEL SLOPE = 0.0213  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 822.24  
FLOW VELOCITY(FEET/SEC.) = 11.38 FLOW DEPTH(FEET) = 4.86  
TRAVEL TIME(MIN.) = 2.75 Tc(MIN.) = 38.60  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1036.00 = 12088.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1036.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 38.60  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.259  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 31.30 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 21.90 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.28  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 53.20  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.99;3H= 2.01;6H= 3.14;24H= 5.71  
S-GRAPH: VALLEY(DEV.)= 0.0%;VALLEY(UNDEV.)/DESERT= 5.0%  
MOUNTAIN= 91.0%;FOOTHILL= 3.0%;DESERT(UNDEV.)= 1.0%  
Tc(HR) = 0.64; LAG(HR) = 0.51; Fm(INCH/HR) = 0.26; Ybar = 0.50  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;  
3HR = 0.99; 6HR = 1.00; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 879.40

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1036.00 = 12088.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0484; Lca/L=0.4,n=.0434; Lca/L=0.5,n=.0398;Lca/L=0.6,n=.0372  
TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 226.20  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 727.85  
TOTAL AREA(ACRES) = 879.40 PEAK FLOW RATE(CFS) = 822.24  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 879.40 TC(MIN.) = 38.60  
AREA-AVERAGED Fm(INCH/HR)= 0.26 Ybar = 0.50  
PEAK FLOW RATE(CFS) = 822.24

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU37010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.130  
MOUNTAIN 0.710  
VALLEY(UNDEVELOPED)/DESERT 0.150  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1036.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU36010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 822.24 Tc(MIN.) = 38.60  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.50  
TOTAL AREA(ACRES) = 879.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1036.00 = 12088.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1036.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 822.24 Tc(MIN.) = 38.60  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.50  
TOTAL AREA(ACRES) = 879.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1036.00 = 12088.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1036.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1037.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2800.00 DOWNSTREAM(FEET) = 2760.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1959.00 CHANNEL SLOPE = 0.0204  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 822.24  
FLOW VELOCITY(FEET/SEC.) = 11.21 FLOW DEPTH(FEET) = 4.92  
TRAVEL TIME(MIN.) = 2.91 Tc(MIN.) = 41.51  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1037.00 = 14047.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1037.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 41.51  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.207  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 40.40 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 56.40 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 96.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.99;3H= 2.01;6H= 3.14;24H= 5.71  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.69; LAG(HR) = 0.55; Fm(INCH/HR) = 0.26; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;  
3HR = 0.99; 6HR = 1.00; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 976.20

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1037.00 = 14047.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0459; Lca/L=0.4,n=.0412; Lca/L=0.5,n=.0378;Lca/L=0.6,n=.0353  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 249.24  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 791.63  
TOTAL AREA(ACRES) = 976.20 PEAK FLOW RATE(CFS) = 822.24  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 976.20 TC(MIN.) = 41.51  
AREA-AVERAGED Fm(INCH/HR)= 0.26 Ybar = 0.51  
PEAK FLOW RATE(CFS) = 822.24

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU38010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 5.100
- 2) 10.000; 3.100
- 3) 15.000; 2.500
- 4) 20.000; 1.800
- 5) 30.000; 1.350
- 6) 60.000; 1.000
- 7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.040
MOUNTAIN	0.890
VALLEY(UNDEVELOPED)/DESERT	0.060
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1037.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU37010E.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 822.24 Tc(MIN.) = 41.51

AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.51

TOTAL AREA(ACRES) = 976.20

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1037.00 = 14047.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1037.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 822.24 Tc(MIN.) = 41.51

AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.51

TOTAL AREA(ACRES) = 976.20

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1037.00 = 14047.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1037.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1038.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 2760.00 DOWNSTREAM(FEET) = 2700.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 2116.00 CHANNEL SLOPE = 0.0284

CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000

MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00

CHANNEL FLOW THRU SUBAREA(CFS) = 822.24

FLOW VELOCITY(FEET/SEC.) = 12.64 FLOW DEPTH(FEET) = 4.49

TRAVEL TIME(MIN.) = 2.79 Tc(MIN.) = 44.30

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1038.00 = 16163.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1038.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 44.30

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.163

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	17.10	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	137.10	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	11.50	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 165.70

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.99;3H= 2.01;6H= 3.14;24H= 5.71

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%

MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 0.74; LAG(HR) = 0.59; Fm(INCH/HR) = 0.26; Ybar = 0.50

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;

3HR = 0.99; 6HR = 1.00; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1141.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1038.00 = 16163.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0439; Lca/L=0.4,n=.0394; Lca/L=0.5,n=.0362;Lca/L=0.6,n=.0338  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 292.92  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 894.04  
TOTAL AREA(ACRES) = 1141.90 PEAK FLOW RATE(CFS) = 894.04

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1141.90 TC(MIN.) = 44.30  
AREA-AVERAGED Fm(INCH/HR)= 0.26 Ybar = 0.50  
PEAK FLOW RATE(CFS) = 894.04

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU39010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=== -----  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1938.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU38010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 894.04 Tc(MIN.) = 44.30  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.50  
TOTAL AREA(ACRES) = 1141.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1938.00 = 16163.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1038.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 894.04 Tc(MIN.) = 44.30  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.50  
TOTAL AREA(ACRES) = 1141.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1038.00 = 16163.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1038.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1039.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2700.00 DOWNSTREAM(FEET) = 2600.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2298.00 CHANNEL SLOPE = 0.0435  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 894.04  
FLOW VELOCITY(FEET/SEC.) = 15.09 FLOW DEPTH(FEET) = 4.18  
TRAVEL TIME(MIN.) = 2.54 Tc(MIN.) = 46.84  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1039.00 = 18461.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1039.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 46.84  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.126  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 3.20 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 10.50 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 88.80 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 102.50  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.99;3H= 2.01;6H= 3.14;24H= 5.71  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.78; LAG(HR) = 0.62; Fm(INCH/HR) = 0.25; Ybar = 0.49  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94;

3HR = 0.99; 6HR = 1.00; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1244.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1039.00 = 18461.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0423; Lca/L=0.4,n=.0380; Lca/L=0.5,n=.0349;Lca/L=0.6,n=.0325  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 324.01  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 932.15  
TOTAL AREA(ACRES) = 1244.40 PEAK FLOW RATE(CFS) = 932.15

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1244.40 TC(MIN.) = 46.84  
AREA-AVERAGED Fm(INCH/HR)= 0.25 Ybar = 0.49  
PEAK FLOW RATE(CFS) = 932.15

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU40010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1039.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU39010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 932.15 Tc(MIN.) = 46.84  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.49  
TOTAL AREA(ACRES) = 1244.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1039.00 = 18461.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1039.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 932.15 Tc(MIN.) = 46.84  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.49  
TOTAL AREA(ACRES) = 1244.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1039.00 = 18461.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1039.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1040.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2600.00 DOWNSTREAM(FEET) = 2400.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3287.00 CHANNEL SLOPE = 0.0608  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 932.15  
FLOW VELOCITY(FEET/SEC.) = 17.22 FLOW DEPTH(FEET) = 3.90  
TRAVEL TIME(MIN.) = 3.18 Tc(MIN.) = 50.02  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1040.00 = 21748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1040.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 50.02  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.085  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 115.00 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 115.00  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.99;3H= 2.01;6H= 3.14;24H= 5.71  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.83; LAG(HR) = 0.67; Fm(INCH/HR) = 0.25; Ybar = 0.48  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94;  
3HR = 0.99; 6HR = 1.00; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1359.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1040.00 = 21748.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0408; Lca/L=0.4,n=.0366; Lca/L=0.5,n=.0336;Lca/L=0.6,n=.0314  
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 359.80  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 962.51  
TOTAL AREA(ACRES) = 1359.40 PEAK FLOW RATE(CFS) = 962.51

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1359.40 TC(MIN.) = 50.02  
AREA-AVERAGED Fm(INCH/HR)= 0.25 Ybar = 0.48  
PEAK FLOW RATE(CFS) = 962.51

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU41010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1040.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU40010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 962.51 Tc(MIN.) = 50.02  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.48  
TOTAL AREA(ACRES) = 1359.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1040.00 = 21748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1040.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 962.51 Tc(MIN.) = 50.02  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.48  
TOTAL AREA(ACRES) = 1359.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1040.00 = 21748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1040.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1041.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2400.00 DOWNSTREAM(FEET) = 2200.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2212.00 CHANNEL SLOPE = 0.0904  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 962.51  
FLOW VELOCITY(FEET/SEC.) = 17.06 FLOW DEPTH(FEET) = 4.02  
TRAVEL TIME(MIN.) = 2.16 Tc(MIN.) = 52.18  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1041.00 = 23960.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1041.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 52.18  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.059  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 61.20 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 156.90 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 218.10  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.99;3H= 2.01;6H= 3.14;24H= 5.71  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.87; LAG(HR) = 0.70; Fm(INCH/HR) = 0.24; Ybar = 0.47  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.93; 30M = 0.93; 1HR = 0.93;  
3HR = 0.99; 6HR = 0.99; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1577.50

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1041.00 = 23960.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0405; Lca/L=0.4,n=.0363; Lca/L=0.5,n=.0334;Lca/L=0.6,n=.0311  
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 424.90  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1110.95  
TOTAL AREA(ACRES) = 1577.50 PEAK FLOW RATE(CFS) = 1110.95

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1577.50 TC(MIN.) = 52.18

AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.47

PEAK FLOW RATE(CFS) = 1110.95  
=====

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU42010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1041.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU41010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1110.95 Tc(MIN.) = 52.18  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.47  
TOTAL AREA(ACRES) = 1577.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1041.00 = 23960.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1041.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1110.95 Tc(MIN.) = 52.18  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.47  
TOTAL AREA(ACRES) = 1577.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1041.00 = 23960.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1041.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1042.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2200.00 DOWNSTREAM(FEET) = 2000.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1708.00 CHANNEL SLOPE = 0.1171  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1110.95  
FLOW VELOCITY(FEET/SEC.) = 19.50 FLOW DEPTH(FEET) = 4.05  
TRAVEL TIME(MIN.) = 1.46 Tc(MIN.) = 53.64  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1042.00 = 25668.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1042.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 53.64  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.042  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 169.60 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 24.80 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 194.40  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.99;3H= 2.01;6H= 3.14;24H= 5.71  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.89; LAG(HR) = 0.72; Fm(INCH/HR) = 0.24; Ybar = 0.47  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;  
3HR = 0.99; 6HR = 0.99; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1771.90

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1042.00 = 25668.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0404; Lca/L=0.4,n=.0362; Lca/L=0.5,n=.0333;Lca/L=0.6,n=.0310  
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 477.72  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1228.87  
TOTAL AREA(ACRES) = 1771.90 PEAK FLOW RATE(CFS) = 1228.87

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.01; 6HR = 3.14; 24HR = 5.71

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1771.90 TC(MIN.) = 53.64  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.47  
PEAK FLOW RATE(CFS) = 1228.87

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU43010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1042.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU42010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1228.87 Tc(MIN.) = 53.64  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.47  
TOTAL AREA(ACRES) = 1771.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1042.00 = 25668.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1042.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1228.87 Tc(MIN.) = 53.64  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.47  
TOTAL AREA(ACRES) = 1771.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1042.00 = 25668.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1042.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1043.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2000.00 DOWNSTREAM(FEET) = 1990.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1322.00 CHANNEL SLOPE = 0.0076  
CHANNEL BASE(FEET) = 20.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1228.87  
FLOW VELOCITY(FEET/SEC.) = 8.26 FLOW DEPTH(FEET) = 5.77  
TRAVEL TIME(MIN.) = 2.67 Tc(MIN.) = 56.31  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1043.00 = 26990.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1043.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 56.31  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.014  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 7.40 0.40 1.00 40  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 42.50 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 106.00 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 155.90  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.99;3H= 2.01;6H= 3.14;24H= 5.70  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.94; LAG(HR) = 0.75; Fm(INCH/HR) = 0.24; Ybar = 0.47  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.91; 30M = 0.91; 1HR = 0.91;

3HR = 0.99; 6HR = 0.99; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1927.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1043.00 = 26990.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0405; Lca/L=0.4,n=.0363; Lca/L=0.5,n=.0333;Lca/L=0.6,n=.0311  
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 521.45  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1292.88  
TOTAL AREA(ACRES) = 1927.80 PEAK FLOW RATE(CFS) = 1292.88

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.98; 3HR = 1.99; 6HR = 3.09; 24HR = 5.62

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1927.80 TC(MIN.) = 56.31  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.47  
PEAK FLOW RATE(CFS) = 1292.88

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU44010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	5.100
2)	10.000;	3.100
3)	15.000;	2.500
4)	20.000;	1.800
5)	30.000;	1.350
6)	60.000;	1.000
7)	120.000;	0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)

VALLEY(DEVELOPED)	0.010
FOOTHILL	0.040
MOUNTAIN	0.890
VALLEY(UNDEVELOPED)/DESERT	0.060
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1043.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU43010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1292.88 Tc(MIN.) = 56.31  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.47  
TOTAL AREA(ACRES) = 1927.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1043.00 = 26990.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1043.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1292.88 Tc(MIN.) = 56.31  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.47  
TOTAL AREA(ACRES) = 1927.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1043.00 = 26990.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1043.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1044.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1990.00 DOWNSTREAM(FEET) = 1980.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1681.00 CHANNEL SLOPE = 0.0059  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1292.88  
FLOW VELOCITY(FEET/SEC.) = 7.48 FLOW DEPTH(FEET) = 5.64  
TRAVEL TIME(MIN.) = 3.75 Tc(MIN.) = 60.05  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1044.00 = 28671.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1044.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 60.05  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.977  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	A	2.20	0.40	1.00	40
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	27.60	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	59.80	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 89.60  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.99;3H= 2.01;6H= 3.13;24H= 5.69  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.24; Ybar = 0.46  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.91; 30M = 0.91; 1HR = 0.91;

3HR = 0.99; 6HR = 0.99; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2017.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1044.00 = 28671.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0408; Lca/L=0.4,n=.0366; Lca/L=0.5,n=.0336;Lca/L=0.6,n=.0314  
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 545.89  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1269.16  
TOTAL AREA(ACRES) = 2017.40 PEAK FLOW RATE(CFS) = 1292.88  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.39; 30M = 0.67; 1HR = 0.97; 3HR = 1.95; 6HR = 3.02; 24HR = 5.46

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 2017.40 TC(MIN.) = 60.05  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.46  
PEAK FLOW RATE(CFS) = 1292.88

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU45010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1044.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU44010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1292.88 Tc(MIN.) = 60.05  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.46  
TOTAL AREA(ACRES) = 2017.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1044.00 = 28671.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1044.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1292.88 Tc(MIN.) = 60.05  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.46  
TOTAL AREA(ACRES) = 2017.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1044.00 = 28671.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1044.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1045.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1980.00 DOWNSTREAM(FEET) = 1960.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2360.00 CHANNEL SLOPE = 0.0085  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1292.88  
FLOW VELOCITY(FEET/SEC.) = 8.45 FLOW DEPTH(FEET) = 5.08  
TRAVEL TIME(MIN.) = 4.65 Tc(MIN.) = 64.71  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1045.00 = 31031.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1045.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 64.71  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.936  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 40.90 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 179.40 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 97.70 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 318.00

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.98;3H= 1.99;6H= 3.10;24H= 5.64  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.08; LAG(HR) = 0.86; Fm(INCH/HR) = 0.24; Ybar = 0.47  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;

3HR = 0.98; 6HR = 0.99; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2335.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1045.00 = 31031.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0409; Lca/L=0.4,n=.0367; Lca/L=0.5,n=.0337;Lca/L=0.6,n=.0315  
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 622.72  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1422.12  
TOTAL AREA(ACRES) = 2335.40 PEAK FLOW RATE(CFS) = 1422.12

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.38; 30M = 0.67; 1HR = 0.96; 3HR = 1.91; 6HR = 2.94; 24HR = 5.32

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 2335.40 TC(MIN.) = 64.71  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.47  
PEAK FLOW RATE(CFS) = 1422.12

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU46010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1045.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME:	LU45010E.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:	
PEAK FLOW RATE(CFS) =	1422.12 Tc(MIN.) = 64.71
AREA-AVERAGED Fm(INCH/HR) =	0.24 Ybar = 0.47
TOTAL AREA(ACRES) =	2335.40
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE 1045.00 = 31031.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1045.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1422.12 Tc(MIN.) = 64.71  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.47  
TOTAL AREA(ACRES) = 2335.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1045.00 = 31031.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1045.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1046.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1960.00 DOWNSTREAM(FEET) = 1915.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2743.00 CHANNEL SLOPE = 0.0164  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1422.12  
FLOW VELOCITY(FEET/SEC.) = 10.91 FLOW DEPTH(FEET) = 4.43  
TRAVEL TIME(MIN.) = 4.19 Tc(MIN.) = 68.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1046.00 = 33774.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1046.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 68.90  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.903  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	30.70	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	79.90	0.25	1.00	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 110.60  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.39;30M= 0.68;1H= 0.98;3H= 1.98;6H= 3.08;24H= 5.59  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.15; LAG(HR) = 0.92; Fm(INCH/HR) = 0.24; Ybar = 0.47  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.89; 30M = 0.89; 1HR = 0.89;  
3HR = 0.98; 6HR = 0.99; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2446.00

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1046.00 = 33774.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0405; Lca/L=0.4,n=.0363; Lca/L=0.5,n=.0333;Lca/L=0.6,n=.0311  
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 638.43  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1400.35  
TOTAL AREA(ACRES) = 2446.00 PEAK FLOW RATE(CFS) = 1422.12  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.33; 30M = 0.64; 1HR = 0.89; 3HR = 1.68; 6HR = 2.52; 24HR = 4.46

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 2446.00 TC(MIN.) = 68.90  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.47  
PEAK FLOW RATE(CFS) = 1422.12

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU47010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 5.100
- 2) 10.000; 3.100
- 3) 15.000; 2.500
- 4) 20.000; 1.800
- 5) 30.000; 1.350
- 6) 60.000; 1.000
- 7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / PARK- SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

- GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
- Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
  - (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.040
MOUNTAIN	0.890
VALLEY(UNDEVELOPED)/DESERT	0.060
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1046.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU46010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1422.12 Tc(MIN.) = 68.90  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.47  
TOTAL AREA(ACRES) = 2446.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1046.00 = 33774.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1046.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1422.12 Tc(MIN.) = 68.90  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.47  
TOTAL AREA(ACRES) = 2446.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1046.00 = 33774.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1046.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1047.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1915.00 DOWNSTREAM(FEET) = 1910.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 221.00 CHANNEL SLOPE = 0.0226  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1422.12  
FLOW VELOCITY(FEET/SEC.) = 12.17 FLOW DEPTH(FEET) = 4.03  
TRAVEL TIME(MIN.) = 0.30 Tc(MIN.) = 69.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1047.00 = 33995.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1047.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 69.20  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.901  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	146.30	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	1591.10	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	118.40	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1855.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.98;3H= 1.98;6H= 3.09;24H= 5.61  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.15; LAG(HR) = 0.92; Fm(INCH/HR) = 0.25; Ybar = 0.48  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.81; 30M = 0.81; 1HR = 0.81;

3HR = 0.97; 6HR = 0.99; 24HR= 0.99  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4301.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1047.00 = 33995.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0404; Lca/L=0.4,n=.0363; Lca/L=0.5,n=.0333;Lca/L=0.6,n=.0311  
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 1111.34  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2258.73  
TOTAL AREA(ACRES) = 4301.80 PEAK FLOW RATE(CFS) = 2258.73

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 1.99; 6HR = 3.11; 24HR = 5.65

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 4301.80 TC(MIN.) = 69.20  
AREA-AVERAGED Fm(INCH/HR)= 0.25 Ybar = 0.48  
PEAK FLOW RATE(CFS) = 2258.73

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU48010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 5.100
- 2) 10.000; 3.100
- 3) 15.000; 2.500
- 4) 20.000; 1.800
- 5) 30.000; 1.350
- 6) 60.000; 1.000
- 7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.070
MOUNTAIN	0.860
VALLEY(UNDEVELOPED)/DESERT	0.060
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1047.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU47010E.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 2258.73 Tc(MIN.) = 69.20

AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.48

TOTAL AREA(ACRES) = 4301.80

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1047.00 = 33995.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1047.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 2258.73 Tc(MIN.) = 69.20

AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.48

TOTAL AREA(ACRES) = 4301.80

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1047.00 = 33995.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1047.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1048.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1910.00 DOWNSTREAM(FEET) = 1750.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 1601.00 CHANNEL SLOPE = 0.0999

CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000

MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 10.00

CHANNEL FLOW THRU SUBAREA(CFS) = 2258.73

FLOW VELOCITY(FEET/SEC.) = 20.08 FLOW DEPTH(FEET) = 3.89

TRAVEL TIME(MIN.) = 1.33 Tc(MIN.) = 70.53

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1048.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 70.53

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.891

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	3.60	0.40	1.00	40
NATURAL FAIR COVER					
"WOODLAND"	A	3.30	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	59.50	0.30	1.00	63
NATURAL POOR COVER					
"BARREN"	B	0.40	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	0.10	0.30	1.00	69
NATURAL FAIR COVER					
"WOODLAND"	B	16.70	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 83.60

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.98;3H= 1.98;6H= 3.09;24H= 5.62  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
 MOUNTAIN= 88.9%;FOOTHILL= 4.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.18; LAG(HR) = 0.94; Fm(INCH/HR) = 0.25; Ybar = 0.48  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.80; 30M = 0.80; 1HR = 0.80;  
 3HR = 0.97; 6HR = 0.99; 24HR= 0.99  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4385.40  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0403; Lca/L=0.4,n=.0362; Lca/L=0.5,n=.0332;Lca/L=0.6,n=.0310  
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 1125.08  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2245.63  
 TOTAL AREA(ACRES) = 4385.40 PEAK FLOW RATE(CFS) = 2258.73  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.00; 6HR = 3.12; 24HR = 5.67

\*\*\*\*\*

FLOW PROCESS FROM NODE 1047.00 TO NODE 1048.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

MAINLINE Tc(MIN) = 70.53  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.960  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	926.70	0.25	1.00	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	0.50	0.25	0.50	69
NATURAL POOR COVER					
"BARREN"	C	10.50	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	10.70	0.25	1.00	79
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	299.20	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	40.40	0.25	1.00	73

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1288.00  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.99;3H= 1.99;6H= 3.10;24H= 5.63  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
 MOUNTAIN= 88.3%;FOOTHILL= 4.7%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.18; LAG(HR) = 0.94; Fm(INCH/HR) = 0.25; Ybar = 0.47  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.77; 30M = 0.77; 1HR = 0.77;  
 3HR = 0.96; 6HR = 0.98; 24HR= 0.99  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 5673.40  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0403; Lca/L=0.4,n=.0362; Lca/L=0.5,n=.0332;Lca/L=0.6,n=.0310  
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 1467.44  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2807.76  
 TOTAL AREA(ACRES) = 5673.40 PEAK FLOW RATE(CFS) = 2807.76

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.00; 6HR = 3.12; 24HR = 5.67

\*\*\*\*\*

FLOW PROCESS FROM NODE 1047.00 TO NODE 1048.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

MAINLINE Tc(MIN) = 70.53  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.960  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	805.90	0.20	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	D	51.50	0.20	1.00	79
NATURAL POOR COVER					
"BARREN"	D	2.40	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	3.10	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	23.30	0.20	1.00	83
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	567.30	0.20	1.00	86

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1453.50  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.99;3H= 1.99;6H= 3.10;24H= 5.64  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
 MOUNTAIN= 87.8%;FOOTHILL= 5.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.18; LAG(HR) = 0.94; Fm(INCH/HR) = 0.24; Ybar = 0.45  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.73; 30M = 0.73; 1HR = 0.73;  
 3HR = 0.96; 6HR = 0.98; 24HR= 0.99  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 7126.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0403; Lca/L=0.4,n=.0362; Lca/L=0.5,n=.0332;Lca/L=0.6,n=.0310  
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 1918.80  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 3461.64  
 TOTAL AREA(ACRES) = 7126.90 PEAK FLOW RATE(CFS) = 3461.64

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.68; 1HR = 0.99; 3HR = 2.00; 6HR = 3.12; 24HR = 5.67

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 7126.90 TC(MIN.) = 70.53  
 AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.45  
 PEAK FLOW RATE(CFS) = 3461.64

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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430 Exchange, Suite 200  
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714 - 734 - 5100

-----  
FILE NAME: LU49010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / PARK- SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.050
MOUNTAIN	0.800
VALLEY(UNDEVELOPED)/DESERT	0.140
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1048.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU48010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3461.64 Tc(MIN.) = 70.53  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.45  
TOTAL AREA(ACRES) = 7126.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1048.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3461.64 Tc(MIN.) = 70.53  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.45  
TOTAL AREA(ACRES) = 7126.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1048.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1049.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1750.00 DOWNSTREAM(FEET) = 1670.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2254.00 CHANNEL SLOPE = 0.0355  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 3461.64  
FLOW VELOCITY(FEET/SEC.) = 16.09 FLOW DEPTH(FEET) = 6.77  
TRAVEL TIME(MIN.) = 2.33 Tc(MIN.) = 72.86  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1049.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 72.86  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.875  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	10.20	0.30	1.00	63
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	B	2.00	0.30	1.00	72
NATURAL FAIR COVER					
"WOODLAND"	B	11.10	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	267.80	0.25	1.00	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	3.40	0.25	0.50	69
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	128.10	0.25	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 422.60  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.40;30M= 0.68;1H= 0.98;3H= 1.98;6H= 3.09;24H= 5.61  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.4%  
           MOUNTAIN= 87.4%;FOOTHILL= 5.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.21; LAG(HR) = 0.97; Fm(INCH/HR) = 0.24; Ybar = 0.45  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.72; 30M = 0.72; 1HR = 0.72;  
 3HR = 0.95; 6HR = 0.98; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 7549.50  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0397; Lca/L=0.4,n=.0356; Lca/L=0.5,n=.0327;Lca/L=0.6,n=.0305  
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 2011.52  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 3621.47  
 TOTAL AREA(ACRES) = 7549.50 PEAK FLOW RATE(CFS) = 3621.47

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.37; 30M = 0.66; 1HR = 0.95; 3HR = 1.87; 6HR = 2.88; 24HR = 5.18

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1048.00 TO NODE 1049.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====  
 MAINLINE Tc(MIN) = 72.86  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.951  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "WOODLAND"	C	4.70	0.25	1.00	73
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	391.50	0.20	1.00	81
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	149.60	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	33.60	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 579.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.39;30M= 0.68;1H= 0.98;3H= 1.98;6H= 3.08;24H= 5.58  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 86.8%;FOOTHILL= 5.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.21; LAG(HR) = 0.97; Fm(INCH/HR) = 0.24; Ybar = 0.44  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.70; 30M = 0.70; 1HR = 0.70;  
 3HR = 0.95; 6HR = 0.97; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 8128.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0397; Lca/L=0.4,n=.0356; Lca/L=0.5,n=.0327;Lca/L=0.6,n=.0305  
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 2167.00  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 3838.72  
 TOTAL AREA(ACRES) = 8128.90 PEAK FLOW RATE(CFS) = 3838.72

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.37; 30M = 0.66; 1HR = 0.95; 3HR = 1.87; 6HR = 2.88; 24HR = 5.18

=====  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 8128.90 TC(MIN.) = 72.86  
 AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.44  
 PEAK FLOW RATE(CFS) = 3838.72

=====  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LU50010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.050  
MOUNTAIN 0.870  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1049.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU49010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3838.72 Tc(MIN.) = 72.86  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.44  
TOTAL AREA(ACRES) = 8128.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1049.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3838.72 Tc(MIN.) = 72.86  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.44  
TOTAL AREA(ACRES) = 8128.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1049.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1050.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1670.00 DOWNSTREAM(FEET) = 1665.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 290.00 CHANNEL SLOPE = 0.0172  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 3838.72  
FLOW VELOCITY(FEET/SEC.) = 12.85 FLOW DEPTH(FEET) = 8.83  
TRAVEL TIME(MIN.) = 0.38 Tc(MIN.) = 73.24  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1050.00 = 38140.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1050.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 73.24  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.872  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 41.60 0.40 1.00 40  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 85.70 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1084.00 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 175.60 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1386.90  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.39;30M= 0.68;1H= 0.98;3H= 1.97;6H= 3.06;24H= 5.55  
S-GRAPH: VALLEY(DEV.) = 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.9%;FOOTHILL= 5.1%;DESERT(UNDEV.) = 0.0%  
Tc(HR) = 1.22; LAG(HR) = 0.98; Fm(INCH/HR) = 0.24; Ybar = 0.45

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.68; 30M = 0.68; 1HR = 0.69;  
3HR = 0.94; 6HR = 0.97; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 9515.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1050.00 = 38140.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0396; Lca/L=0.4,n=.0355; Lca/L=0.5,n=.0327;Lca/L=0.6,n=.0305  
TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 2484.41  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 4341.93  
TOTAL AREA(ACRES) = 9515.80 PEAK FLOW RATE(CFS) = 4341.93

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.38; 30M = 0.67; 1HR = 0.97; 3HR = 1.93; 6HR = 2.99; 24HR = 5.40

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 9515.80 TC(MIN.) = 73.24  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.45  
PEAK FLOW RATE(CFS) = 4341.93

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU51010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.050  
MOUNTAIN 0.870  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1050.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU50010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 4341.93 Tc(MIN.) = 73.24  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.45  
TOTAL AREA(ACRES) = 9515.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1050.00 = 38140.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1050.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 4341.93 Tc(MIN.) = 73.24  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.45  
TOTAL AREA(ACRES) = 9515.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1050.00 = 38140.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1050.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1051.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1665.00 DOWNSTREAM(FEET) = 1630.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2134.00 CHANNEL SLOPE = 0.0164  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 4341.93  
FLOW VELOCITY(FEET/SEC.) = 12.83 FLOW DEPTH(FEET) = 8.74  
TRAVEL TIME(MIN.) = 2.77 Tc(MIN.) = 76.01  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1051.00 = 40274.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1051.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 76.01  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.854  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	297.00	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	163.30	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 460.30  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.39;30M= 0.67;1H= 0.98;3H= 1.96;6H= 3.05;24H= 5.53  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.9%;FOOTHILL= 5.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.27; LAG(HR) = 1.01; Fm(INCH/HR) = 0.24; Ybar = 0.45  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;  
3HR = 0.94; 6HR = 0.97; 24HR = 0.98  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 9976.10

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1051.00 = 40274.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0392; Lca/L=0.4,n=.0352; Lca/L=0.5,n=.0323;Lca/L=0.6,n=.0302  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 2598.96  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 4159.50  
TOTAL AREA(ACRES) = 9976.10 PEAK FLOW RATE(CFS) = 4341.93  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.37; 30M = 0.66; 1HR = 0.94; 3HR = 1.85; 6HR = 2.84; 24HR = 5.11

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 9976.10 TC(MIN.) = 76.01  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.45  
PEAK FLOW RATE(CFS) = 4341.93

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU52010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.050  
MOUNTAIN 0.870  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1051.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU51010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 4341.93 Tc(MIN.) = 76.01  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.45  
TOTAL AREA(ACRES) = 9976.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1051.00 = 40274.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1051.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 4341.93 Tc(MIN.) = 76.01  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.45  
TOTAL AREA(ACRES) = 9976.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1051.00 = 40274.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1051.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1052.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1630.00 DOWNSTREAM(FEET) = 1410.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5523.00 CHANNEL SLOPE = 0.0398  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 4341.93  
FLOW VELOCITY(FEET/SEC.) = 17.48 FLOW DEPTH(FEET) = 6.76  
TRAVEL TIME(MIN.) = 5.27 Tc(MIN.) = 81.28  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1052.00 = 45797.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1052.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 81.28  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.821  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 19.10 0.40 1.00 40  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 198.40 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 507.40 0.20 1.00 81  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" D 26.70 0.20 1.00 86  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 751.60  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.39;30M= 0.67;1H= 0.97;3H= 1.94;6H= 3.02;24H= 5.46  
S-GRAPH: VALLEY(DEV.) = 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.9%;FOOTHILL= 5.1%;DESERT(UNDEV.) = 0.0%  
Tc(HR) = 1.35; LAG(HR) = 1.08; Fm(INCH/HR) = 0.24; Ybar = 0.46

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.67; 1HR = 0.67;  
3HR = 0.94; 6HR = 0.97; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 10727.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1052.00 = 45797.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0381; Lca/L=0.4,n=.0341; Lca/L=0.5,n=.0314;Lca/L=0.6,n=.0293  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 2746.18  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 4352.18  
TOTAL AREA(ACRES) = 10727.70 PEAK FLOW RATE(CFS) = 4352.18

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.34; 30M = 0.64; 1HR = 0.89; 3HR = 1.69; 6HR = 2.53; 24HR = 4.49

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 10727.70 TC(MIN.) = 81.28  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.46  
PEAK FLOW RATE(CFS) = 4352.18

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU53010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.110  
MOUNTAIN 0.810  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1052.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME:	LU52010E.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:	
PEAK FLOW RATE(CFS) =	4352.18 Tc(MIN.) = 81.28
AREA-AVERAGED Fm(INCH/HR) =	0.24 Ybar = 0.46
TOTAL AREA(ACRES) =	10727.70
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE 1052.00 = 45797.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1052.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 4352.18 Tc(MIN.) = 81.28  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.46  
TOTAL AREA(ACRES) = 10727.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1052.00 = 45797.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1052.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1053.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1410.00 DOWNSTREAM(FEET) = 1297.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2262.00 CHANNEL SLOPE = 0.0500  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 4352.18  
FLOW VELOCITY(FEET/SEC.) = 18.91 FLOW DEPTH(FEET) = 6.34  
TRAVEL TIME(MIN.) = 1.99 Tc(MIN.) = 83.27  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1053.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 83.27  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.810  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	4.50	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	B	2.20	0.30	1.00	72
NATURAL FAIR COVER "WOODLAND"	B	31.40	0.30	1.00	60
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	214.70	0.25	1.00	75
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	21.40	0.25	0.50	69
NATURAL POOR COVER "BARREN"	C	0.70	0.25	1.00	91

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.96  
SUBAREA AREA(ACRES) = 274.90  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.39;30M= 0.67;1H= 0.97;3H= 1.94;6H= 3.02;24H= 5.46  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.7%;FOOTHILL= 5.3%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.39; LAG(HR) = 1.11; Fm(INCH/HR) = 0.24; Ybar = 0.46  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.65; 30M = 0.66; 1HR = 0.67;  
3HR = 0.94; 6HR = 0.97; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 11002.60  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0377; Lca/L=0.4,n=.0338; Lca/L=0.5,n=.0310;Lca/L=0.6,n=.0290  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 2808.58  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 4420.01  
TOTAL AREA(ACRES) = 11002.60 PEAK FLOW RATE(CFS) = 4420.01

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.38; 30M = 0.67; 1HR = 0.96; 3HR = 1.93; 6HR = 2.98; 24HR = 5.39

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1053.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 83.27  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.911  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	C	7.60	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	35.40	0.25	1.00	77
PUBLIC PARK	C	0.20	0.25	0.85	69
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	85.00	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	92.50	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	717.00	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 937.70

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.39;30M= 0.67;1H= 0.97;3H= 1.94;6H= 3.01;24H= 5.45  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.3%;FOOTHILL= 5.7%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.39; LAG(HR) = 1.11; Fm(INCH/HR) = 0.23; Ybar = 0.45  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.64; 30M = 0.65; 1HR = 0.66;  
3HR = 0.93; 6HR = 0.97; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 11940.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0377; Lca/L=0.4,n=.0338; Lca/L=0.5,n=.0310;Lca/L=0.6,n=.0290  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3057.77  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 4737.54  
TOTAL AREA(ACRES) = 11940.30 PEAK FLOW RATE(CFS) = 4737.54

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.38; 30M = 0.67; 1HR = 0.96; 3HR = 1.93; 6HR = 2.98; 24HR = 5.39

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1053.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 83.27  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.911

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	2.90	0.20	0.50	75
NATURAL FAIR COVER					
"GRASS"	D	10.20	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	44.50	0.20	1.00	83
PUBLIC PARK	D	0.70	0.20	0.85	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	674.40	0.20	1.00	86
NATURAL FAIR COVER					
"WOODLAND"	D	148.30	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 881.00

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.39;30M= 0.67;1H= 0.97;3H= 1.94;6H= 3.01;24H= 5.45  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.39; LAG(HR) = 1.11; Fm(INCH/HR) = 0.23; Ybar = 0.44  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.62; 30M = 0.64; 1HR = 0.64;  
3HR = 0.93; 6HR = 0.96; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 12821.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0377; Lca/L=0.4,n=.0338; Lca/L=0.5,n=.0310;Lca/L=0.6,n=.0290  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3316.44  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5043.18  
TOTAL AREA(ACRES) = 12821.30 PEAK FLOW RATE(CFS) = 5043.18

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.38; 30M = 0.67; 1HR = 0.96; 3HR = 1.93; 6HR = 2.98; 24HR = 5.39

=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 12821.30 TC(MIN.) = 83.27  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.44  
PEAK FLOW RATE(CFS) = 5043.18

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU54010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.060  
MOUNTAIN 0.860  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1053.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU53010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 5043.18 Tc(MIN.) = 83.27  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.44  
TOTAL AREA(ACRES) = 12821.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1053.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 5043.18 Tc(MIN.) = 83.27  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.44  
TOTAL AREA(ACRES) = 12821.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1053.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1054.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1297.00 DOWNSTREAM(FEET) = 1235.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3488.00 CHANNEL SLOPE = 0.0178  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 5043.18  
FLOW VELOCITY(FEET/SEC.) = 16.14 FLOW DEPTH(FEET) = 8.18  
TRAVEL TIME(MIN.) = 3.60 Tc(MIN.) = 86.87  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1054.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 86.87  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.791  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 435.00 0.25 1.00 75  
NATURAL FAIR COVER  
"OPEN BRUSH" C 7.80 0.25 1.00 77  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 36.00 0.25 1.00 81  
NATURAL FAIR COVER  
"WOODLAND" C 10.20 0.25 1.00 73  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 271.30 0.20 1.00 81  
NATURAL FAIR COVER  
"OPEN BRUSH" D 26.90 0.20 1.00 83  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 787.20  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.38;30M= 0.67;1H= 0.97;3H= 1.93;6H= 2.99;24H= 5.40  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.45; LAG(HR) = 1.16; Fm(INCH/HR) = 0.23; Ybar = 0.45  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.61; 30M = 0.63; 1HR = 0.63;  
 3HR = 0.92; 6HR = 0.96; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 13608.50  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0370; Lca/L=0.4,n=.0332; Lca/L=0.5,n=.0305;Lca/L=0.6,n=.0284  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3466.55  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5170.61  
 TOTAL AREA(ACRES) = 13608.50 PEAK FLOW RATE(CFS) = 5170.61

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.34; 30M = 0.64; 1HR = 0.90; 3HR = 1.72; 6HR = 2.59; 24HR = 4.60

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1053.00 TO NODE 1054.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====  
 MAINLINE Tc(MIN) = 86.87  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.897  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	5.30	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	13.70	0.20	1.00	79

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 19.00

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.38;30M= 0.67;1H= 0.97;3H= 1.93;6H= 2.99;24H= 5.40  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.45; LAG(HR) = 1.16; Fm(INCH/HR) = 0.23; Ybar = 0.45  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.61; 30M = 0.63; 1HR = 0.63;  
 3HR = 0.92; 6HR = 0.96; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 13627.50  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0370; Lca/L=0.4,n=.0332; Lca/L=0.5,n=.0305;Lca/L=0.6,n=.0284  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3470.63  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5175.67  
 TOTAL AREA(ACRES) = 13627.50 PEAK FLOW RATE(CFS) = 5175.67

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.34; 30M = 0.64; 1HR = 0.90; 3HR = 1.72; 6HR = 2.59; 24HR = 4.60

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 13627.50 TC(MIN.) = 86.87  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.45  
 PEAK FLOW RATE(CFS) = 5175.67

=====  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LU55010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 5.100
- 2) 10.000; 3.100
- 3) 15.000; 2.500
- 4) 20.000; 1.800
- 5) 30.000; 1.350
- 6) 60.000; 1.000
- 7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.060
MOUNTAIN	0.860
VALLEY(UNDEVELOPED)/DESERT	0.070
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1054.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU54010E.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5175.67 Tc(MIN.) = 86.87

AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.45

TOTAL AREA(ACRES) = 13627.50

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1054.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5175.67 Tc(MIN.) = 86.87

AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.45

TOTAL AREA(ACRES) = 13627.50

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1054.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1055.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1235.00 DOWNSTREAM(FEET) = 1115.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3993.00 CHANNEL SLOPE = 0.0301  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 5175.67  
FLOW VELOCITY(FEET/SEC.) = 19.53 FLOW DEPTH(FEET) = 7.14  
TRAVEL TIME(MIN.) = 3.41 Tc(MIN.) = 90.28  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1055.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 90.28  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.773

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	43.80	0.25	1.00	75
NATURAL FAIR COVER "OPEN BRUSH"	C	21.40	0.25	1.00	77
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	C	35.80	0.25	1.00	81
NATURAL FAIR COVER "WOODLAND"	C	11.10	0.25	1.00	73
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	659.60	0.20	1.00	81
NATURAL FAIR COVER "OPEN BRUSH"	D	129.70	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 901.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.38;30M= 0.67;1H= 0.96;3H= 1.91;6H= 2.95;24H= 5.33  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.50; LAG(HR) = 1.20; Fm(INCH/HR) = 0.23; Ybar = 0.45  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.59; 30M = 0.62; 1HR = 0.62;  
 3HR = 0.92; 6HR = 0.96; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 14528.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0362; Lca/L=0.4,n=.0325; Lca/L=0.5,n=.0298;Lca/L=0.6,n=.0278  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3640.12  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5293.00  
 TOTAL AREA(ACRES) = 14528.90 PEAK FLOW RATE(CFS) = 5293.00

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.32; 30M = 0.63; 1HR = 0.88; 3HR = 1.63; 6HR = 2.42; 24HR = 4.26

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1054.00 TO NODE 1055.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====  
 MAINLINE Tc(MIN) = 90.28  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.884  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	86.60	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	43.40	0.20	1.00	79

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 130.00

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.38;30M= 0.67;1H= 0.96;3H= 1.91;6H= 2.95;24H= 5.32  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.50; LAG(HR) = 1.20; Fm(INCH/HR) = 0.23; Ybar = 0.45  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.59; 30M = 0.61; 1HR = 0.62;  
 3HR = 0.92; 6HR = 0.96; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 14658.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0362; Lca/L=0.4,n=.0325; Lca/L=0.5,n=.0298;Lca/L=0.6,n=.0278  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3666.80  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5324.01  
 TOTAL AREA(ACRES) = 14658.90 PEAK FLOW RATE(CFS) = 5324.01

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.32; 30M = 0.63; 1HR = 0.88; 3HR = 1.63; 6HR = 2.42; 24HR = 4.26

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 14658.90 TC(MIN.) = 90.28  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.45  
 PEAK FLOW RATE(CFS) = 5324.01

=====  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU56010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.060  
MOUNTAIN 0.860  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1055.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU55010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 5324.01 Tc(MIN.) = 90.28  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.45  
TOTAL AREA(ACRES) = 14658.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1055.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 5324.01 Tc(MIN.) = 90.28  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.45  
TOTAL AREA(ACRES) = 14658.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1055.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1056.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1115.00 DOWNSTREAM(FEET) = 978.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 4363.00 CHANNEL SLOPE = 0.0314  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 5324.01  
FLOW VELOCITY(FEET/SEC.) = 20.01 FLOW DEPTH(FEET) = 7.16  
TRAVEL TIME(MIN.) = 3.63 Tc(MIN.) = 93.91  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1056.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 93.91  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.756  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	11.50	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	B	2.90	0.30	1.00	72
NATURAL FAIR COVER "WOODLAND"	B	15.10	0.30	1.00	60
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	566.60	0.25	1.00	75
NATURAL FAIR COVER "OPEN BRUSH"	C	9.10	0.25	1.00	77
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	C	601.90	0.25	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1207.10  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.38;30M= 0.67;1H= 0.96;3H= 1.89;6H= 2.92;24H= 5.26  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.57; LAG(HR) = 1.25; Fm(INCH/HR) = 0.23; Ybar = 0.45  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.57; 30M = 0.60; 1HR = 0.61;  
 3HR = 0.91; 6HR = 0.96; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 15866.00  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0355; Lca/L=0.4,n=.0318; Lca/L=0.5,n=.0292;Lca/L=0.6,n=.0273  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 3890.39  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5457.52  
 TOTAL AREA(ACRES) = 15866.00 PEAK FLOW RATE(CFS) = 5457.52

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.34; 30M = 0.64; 1HR = 0.90; 3HR = 1.72; 6HR = 2.59; 24HR = 4.60

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1055.00 TO NODE 1056.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====  
 MAINLINE Tc(MIN) = 93.91  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.870  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "WOODLAND"	C	84.60	0.25	1.00	73
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	433.40	0.20	1.00	81
NATURAL FAIR COVER "OPEN BRUSH"	D	116.90	0.20	1.00	83
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	298.40	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	94.40	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1027.70  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.37;30M= 0.66;1H= 0.95;3H= 1.88;6H= 2.90;24H= 5.22  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.57; LAG(HR) = 1.25; Fm(INCH/HR) = 0.23; Ybar = 0.45  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.56; 30M = 0.59; 1HR = 0.60;  
 3HR = 0.91; 6HR = 0.96; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 16893.70  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0355; Lca/L=0.4,n=.0318; Lca/L=0.5,n=.0292;Lca/L=0.6,n=.0273  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 4111.43  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5711.93  
 TOTAL AREA(ACRES) = 16893.70 PEAK FLOW RATE(CFS) = 5711.93

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.34; 30M = 0.64; 1HR = 0.90; 3HR = 1.72; 6HR = 2.59; 24HR = 4.60

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 16893.70 TC(MIN.) = 93.91  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.45  
 PEAK FLOW RATE(CFS) = 5711.93

=====  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU57010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=== -----  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.060  
MOUNTAIN 0.860  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1056.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU56010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 5711.93 Tc(MIN.) = 93.91  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.45  
TOTAL AREA(ACRES) = 16893.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1056.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 5711.93 Tc(MIN.) = 93.91  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.45  
TOTAL AREA(ACRES) = 16893.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1056.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1057.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 978.00 DOWNSTREAM(FEET) = 800.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5201.00 CHANNEL SLOPE = 0.0342  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 5711.93  
FLOW VELOCITY(FEET/SEC.) = 18.02 FLOW DEPTH(FEET) = 8.28  
TRAVEL TIME(MIN.) = 4.81 Tc(MIN.) = 98.72  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1057.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 98.72  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.735  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 2.00 0.25 1.00 75  
NATURAL FAIR COVER  
"MEADOWS" C 0.90 0.25 1.00 80  
NATURAL FAIR COVER  
"OPEN BRUSH" C 40.20 0.25 1.00 77  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 0.30 0.25 1.00 81  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 208.80 0.20 1.00 81  
NATURAL FAIR COVER  
"OPEN BRUSH" D 155.20 0.20 1.00 83  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 407.40  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.37;30M= 0.66;1H= 0.95;3H= 1.87;6H= 2.88;24H= 5.18  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.65; LAG(HR) = 1.32; Fm(INCH/HR) = 0.23; Ybar = 0.45  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.56; 30M = 0.58; 1HR = 0.59;  
 3HR = 0.90; 6HR = 0.96; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 17301.10  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0350; Lca/L=0.4,n=.0314; Lca/L=0.5,n=.0288;Lca/L=0.6,n=.0269  
 TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 4159.00  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5692.20  
 TOTAL AREA(ACRES) = 17301.10 PEAK FLOW RATE(CFS) = 5711.93  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.27; 30M = 0.60; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.25

\*\*\*\*\*

FLOW PROCESS FROM NODE 1056.00 TO NODE 1057.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 98.72  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.852  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	63.60	0.20	1.00	86
NATURAL FAIR COVER					
"WOODLAND"	D	57.80	0.20	1.00	79

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 121.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.37;30M= 0.66;1H= 0.95;3H= 1.87;6H= 2.87;24H= 5.16  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.65; LAG(HR) = 1.32; Fm(INCH/HR) = 0.23; Ybar = 0.45  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.56; 30M = 0.58; 1HR = 0.59;  
 3HR = 0.90; 6HR = 0.96; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 17422.50  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0350; Lca/L=0.4,n=.0314; Lca/L=0.5,n=.0288;Lca/L=0.6,n=.0269  
 TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 4174.22  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5711.75  
 TOTAL AREA(ACRES) = 17422.50 PEAK FLOW RATE(CFS) = 5711.93  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.27; 30M = 0.60; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.25

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 17422.50 TC(MIN.) = 98.72  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.45  
 PEAK FLOW RATE(CFS) = 5711.93

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LU58010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	5.100
2)	10.000;	3.100
3)	15.000;	2.500
4)	20.000;	1.800
5)	30.000;	1.350
6)	60.000;	1.000
7)	120.000;	0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
===

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.100
MOUNTAIN	0.780
VALLEY(UNDEVELOPED)/DESERT	0.110
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1057.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU57010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 5711.93 Tc(MIN.) = 98.72  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.45  
TOTAL AREA(ACRES) = 17422.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1057.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 5711.93 Tc(MIN.) = 98.72  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.45  
TOTAL AREA(ACRES) = 17422.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1057.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 800.00 DOWNSTREAM(FEET) = 657.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5445.00 CHANNEL SLOPE = 0.0263  
CHANNEL BASE(FEET) = 35.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 5711.93  
FLOW VELOCITY(FEET/SEC.) = 16.08 FLOW DEPTH(FEET) = 8.22  
TRAVEL TIME(MIN.) = 5.64 Tc(MIN.) = 104.37  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 104.37  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.712  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	96.50	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.70	0.40	0.50	32
NATURAL FAIR COVER					
"OPEN BRUSH"	A	12.00	0.40	1.00	46
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	A	30.00	0.40	1.00	55
NATURAL FAIR COVER					
"WOODLAND"	A	91.00	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	37.50	0.30	1.00	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.39  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 267.70  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.37;30M= 0.66;1H= 0.95;3H= 1.87;6H= 2.87;24H= 5.16  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.1%  
MOUNTAIN= 85.8%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.74; LAG(HR) = 1.39; Fm(INCH/HR) = 0.23; Ybar = 0.46  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.55; 30M = 0.58; 1HR = 0.59;  
3HR = 0.90; 6HR = 0.95; 24HR= 0.97  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 17690.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0347; Lca/L=0.4,n=.0311; Lca/L=0.5,n=.0285;Lca/L=0.6,n=.0266  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 4182.75  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5682.67  
TOTAL AREA(ACRES) = 17690.20 PEAK FLOW RATE(CFS) = 5711.93  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.35; 30M = 0.65; 1HR = 0.91; 3HR = 1.75; 6HR = 2.64; 24HR = 4.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 104.37  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.830  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	1.30	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	2.40	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	17.50	0.30	1.00	69
COMMERCIAL	B	2.20	0.30	0.10	56
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	B	15.70	0.30	1.00	72
NATURAL FAIR COVER					
"WOODLAND"	B	206.30	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 245.40

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.37;30M= 0.66;1H= 0.95;3H= 1.86;6H= 2.86;24H= 5.15  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.1%  
MOUNTAIN= 85.7%;FOOTHILL= 6.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.74; LAG(HR) = 1.39; Fm(INCH/HR) = 0.23; Ybar = 0.46  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.55; 30M = 0.57; 1HR = 0.59;  
3HR = 0.90; 6HR = 0.95; 24HR= 0.97  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 17935.60  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0347; Lca/L=0.4,n=.0311; Lca/L=0.5,n=.0285;Lca/L=0.6,n=.0266  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 4209.23  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5719.81  
TOTAL AREA(ACRES) = 17935.60 PEAK FLOW RATE(CFS) = 5719.81

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.35; 30M = 0.65; 1HR = 0.91; 3HR = 1.75; 6HR = 2.64; 24HR = 4.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 104.37

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.830  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	1027.50	0.25	1.00	75
NATURAL FAIR COVER					
"MEADOWS"	C	2.90	0.25	1.00	80
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	0.40	0.25	0.50	69
NATURAL FAIR COVER					
"GRASS"	C	17.00	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	163.50	0.25	1.00	77
COMMERCIAL	C	1.10	0.25	0.10	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1212.40

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.37;30M= 0.66;1H= 0.94;3H= 1.86;6H= 2.85;24H= 5.12  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.4%  
MOUNTAIN= 85.2%;FOOTHILL= 6.4%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.74; LAG(HR) = 1.39; Fm(INCH/HR) = 0.23; Ybar = 0.47  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.54; 30M = 0.56; 1HR = 0.58;  
3HR = 0.89; 6HR = 0.95; 24HR= 0.97  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 19148.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0347; Lca/L=0.4,n=.0311; Lca/L=0.5,n=.0285;Lca/L=0.6,n=.0266  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 4423.25  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5960.80  
TOTAL AREA(ACRES) = 19148.00 PEAK FLOW RATE(CFS) = 5960.80

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.35; 30M = 0.65; 1HR = 0.91; 3HR = 1.75; 6HR = 2.64; 24HR = 4.71

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 104.37  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.830  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	572.50	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	252.80	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	1472.40	0.20	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	D	295.00	0.20	1.00	79
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	0.90	0.20	0.50	75
NATURAL FAIR COVER					
"GRASS"	D	2.10	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 2595.70

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.37;30M= 0.66;1H= 0.94;3H= 1.84;6H= 2.82;24H= 5.07  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.8%  
MOUNTAIN= 84.4%;FOOTHILL= 6.8%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.74; LAG(HR) = 1.39; Fm(INCH/HR) = 0.23; Ybar = 0.47  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.51; 30M = 0.54; 1HR = 0.55;  
 3HR = 0.88; 6HR = 0.95; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 21743.70  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0347; Lca/L=0.4,n=.0311; Lca/L=0.5,n=.0285;Lca/L=0.6,n=.0266  
 TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 4957.60  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 6531.85  
 TOTAL AREA(ACRES) = 21743.70 PEAK FLOW RATE(CFS) = 6531.85

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.35; 30M = 0.65; 1HR = 0.91; 3HR = 1.75; 6HR = 2.64; 24HR = 4.71

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 104.37  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.830  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	D	407.80	0.20	1.00	83
COMMERCIAL	D	0.90	0.20	0.10	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	1735.70	0.20	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 2144.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.37;30M= 0.66;1H= 0.94;3H= 1.84;6H= 2.81;24H= 5.04  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
 MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.74; LAG(HR) = 1.39; Fm(INCH/HR) = 0.23; Ybar = 0.46  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.49; 30M = 0.52; 1HR = 0.54;  
 3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 23888.10  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0347; Lca/L=0.4,n=.0311; Lca/L=0.5,n=.0285;Lca/L=0.6,n=.0266  
 TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 5466.90  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7045.88  
 TOTAL AREA(ACRES) = 23888.10 PEAK FLOW RATE(CFS) = 7045.88

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.35; 30M = 0.65; 1HR = 0.91; 3HR = 1.75; 6HR = 2.64; 24HR = 4.71

=====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 23888.10 TC(MIN.) = 104.37  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.46  
 PEAK FLOW RATE(CFS) = 7045.88

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU59010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	5.100
2)	10.000;	3.100
3)	15.000;	2.500
4)	20.000;	1.800
5)	30.000;	1.350
6)	60.000;	1.000
7)	120.000;	0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)

VALLEY(DEVELOPED)	0.010
FOOTHILL	0.070
MOUNTAIN	0.840
VALLEY(UNDEVELOPED)/DESERT	0.080
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1058.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU58010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 7045.88 Tc(MIN.) = 104.37  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.46  
TOTAL AREA(ACRES) = 23888.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1058.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 7045.88 Tc(MIN.) = 104.37  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.46  
TOTAL AREA(ACRES) = 23888.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1058.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 657.00 DOWNSTREAM(FEET) = 630.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2185.00 CHANNEL SLOPE = 0.0124  
CHANNEL BASE(FEET) = 50.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 7045.88  
FLOW VELOCITY(FEET/SEC.) = 14.52 FLOW DEPTH(FEET) = 8.32  
TRAVEL TIME(MIN.) = 2.51 Tc(MIN.) = 106.88  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 106.88  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.702  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	A	21.30	0.40	1.00	40
NATURAL FAIR COVER "OPEN BRUSH"	A	15.80	0.40	1.00	46
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	A	8.90	0.40	1.00	55
NATURAL FAIR COVER "WOODLAND"	A	23.80	0.40	1.00	36
COMMERCIAL NATURAL FAIR COVER "WOODLAND"	B	0.70	0.30	0.10	56
NATURAL FAIR COVER "WOODLAND"	B	2.50	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 73.00  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.37;30M= 0.66;1H= 0.94;3H= 1.83;6H= 2.80;24H= 5.04



S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.78; LAG(HR) = 1.43; Fm(INCH/HR) = 0.23; Ybar = 0.46  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.49; 30M = 0.52; 1HR = 0.54;  
3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 23961.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0345; Lca/L=0.4,n=.0310; Lca/L=0.5,n=.0284;Lca/L=0.6,n=.0265  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 5463.59  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7003.62  
TOTAL AREA(ACRES) = 23961.10 PEAK FLOW RATE(CFS) = 7045.88  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.29; 30M = 0.61; 1HR = 0.83; 3HR = 1.48; 6HR = 2.13; 24HR = 3.67

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 106.88

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.820  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 403.90 0.25 1.00 75  
NATURAL POOR COVER  
"BARREN" C 3.80 0.25 1.00 91  
NATURAL FAIR COVER  
"GRASS" C 7.00 0.25 1.00 79  
NATURAL FAIR COVER  
"OPEN BRUSH" C 145.40 0.25 1.00 77  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 167.50 0.25 1.00 81  
NATURAL FAIR COVER  
"WOODLAND" C 36.90 0.25 1.00 73

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 764.50  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.36;30M= 0.66;1H= 0.93;3H= 1.82;6H= 2.78;24H= 4.99

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.78; LAG(HR) = 1.43; Fm(INCH/HR) = 0.23; Ybar = 0.46  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.48; 30M = 0.52; 1HR = 0.54;  
3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 24725.60  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0345; Lca/L=0.4,n=.0310; Lca/L=0.5,n=.0284;Lca/L=0.6,n=.0265  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 5545.94  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7095.23  
TOTAL AREA(ACRES) = 24725.60 PEAK FLOW RATE(CFS) = 7095.23

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.29; 30M = 0.61; 1HR = 0.83; 3HR = 1.48; 6HR = 2.13; 24HR = 3.67

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 106.88

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.820  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 289.70 0.20 1.00 81  
NATURAL FAIR COVER  
"MEADOWS" D 0.20 0.20 1.00 84  
NATURAL FAIR COVER  
"GRASS" D 0.10 0.20 1.00 84  
NATURAL FAIR COVER  
"OPEN BRUSH" D 117.70 0.20 1.00 83  
COMMERCIAL D 3.40 0.20 0.10 75  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" D 287.30 0.20 1.00 86  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 698.40

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.36;30M= 0.66;1H= 0.93;3H= 1.81;6H= 2.77;24H= 4.96

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.78; LAG(HR) = 1.43; Fm(INCH/HR) = 0.23; Ybar = 0.46  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.48; 30M = 0.51; 1HR = 0.53;  
3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 25424.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0345; Lca/L=0.4,n=.0310; Lca/L=0.5,n=.0284;Lca/L=0.6,n=.0265  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 5652.82  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7205.70  
TOTAL AREA(ACRES) = 25424.00 PEAK FLOW RATE(CFS) = 7205.70

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.29; 30M = 0.61; 1HR = 0.83; 3HR = 1.48; 6HR = 2.13; 24HR = 3.67

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 106.88

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.820  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"WOODLAND" D 45.00 0.20 1.00 79  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 45.00

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.36;30M= 0.66;1H= 0.93;3H= 1.81;6H= 2.76;24H= 4.96

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.78; LAG(HR) = 1.43; Fm(INCH/HR) = 0.23; Ybar = 0.46  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.48; 30M = 0.51; 1HR = 0.53;  
3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 25469.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0345; Lca/L=0.4,n=.0310; Lca/L=0.5,n=.0284;Lca/L=0.6,n=.0265  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 5658.58  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7212.17  
TOTAL AREA(ACRES) = 25469.00 PEAK FLOW RATE(CFS) = 7212.17

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.29; 30M = 0.61; 1HR = 0.83; 3HR = 1.48; 6HR = 2.13; 24HR = 3.67

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 25469.00 TC(MIN.) = 106.88

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.46

PEAK FLOW RATE(CFS) = 7212.17

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU60010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.070  
MOUNTAIN 0.840  
VALLEY(UNDEVELOPED)/DESERT 0.080  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1059.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU59010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 7212.17 Tc(MIN.) = 106.88  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.46  
TOTAL AREA(ACRES) = 25469.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1059.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 7212.17 Tc(MIN.) = 106.88  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.46  
TOTAL AREA(ACRES) = 25469.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1059.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 630.00 DOWNSTREAM(FEET) = 518.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 7828.00 CHANNEL SLOPE = 0.0143  
CHANNEL BASE(FEET) = 50.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 7212.17  
FLOW VELOCITY(FEET/SEC.) = 15.38 FLOW DEPTH(FEET) = 8.07  
TRAVEL TIME(MIN.) = 8.48 Tc(MIN.) = 115.36  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 115.36  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.672  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 37.80 0.40 1.00 40  
NATURAL FAIR COVER  
"OPEN BRUSH" A 124.10 0.40 1.00 46  
COMMERCIAL A 3.70 0.40 0.10 32  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" A 0.20 0.40 1.00 55  
NATURAL FAIR COVER  
"WOODLAND" A 68.90 0.40 1.00 36  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 17.60 0.30 1.00 63  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.39  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 252.30  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.36;30M= 0.65;1H= 0.93;3H= 1.81;6H= 2.76;24H= 4.94

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.92; LAG(HR) = 1.54; Fm(INCH/HR) = 0.23; Ybar = 0.47  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.47; 30M = 0.51; 1HR = 0.53;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 25721.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0341; Lca/L=0.4,n=.0306; Lca/L=0.5,n=.0281;Lca/L=0.6,n=.0262  
TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 5615.81  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 6850.90  
TOTAL AREA(ACRES) = 25721.30 PEAK FLOW RATE(CFS) = 7212.17  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 115.36

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.788  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"GRASS" B 1.30 0.30 1.00 69  
NATURAL FAIR COVER  
"OPEN BRUSH" B 11.80 0.30 1.00 66  
COMMERCIAL B 5.10 0.30 0.10 56  
NATURAL FAIR COVER  
"WOODLAND" B 18.00 0.30 1.00 60  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 209.70 0.25 1.00 75  
NATURAL POOR COVER  
"BARREN" C 2.50 0.25 1.00 91

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98

SUBAREA AREA(ACRES) = 248.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.36;30M= 0.65;1H= 0.93;3H= 1.80;6H= 2.75;24H= 4.92

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.92; LAG(HR) = 1.54; Fm(INCH/HR) = 0.23; Ybar = 0.47

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.47; 30M = 0.51; 1HR = 0.53;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 25969.71

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0341; Lca/L=0.4,n=.0306; Lca/L=0.5,n=.0281;Lca/L=0.6,n=.0262

TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 5628.67

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 6867.78

TOTAL AREA(ACRES) = 25969.71 PEAK FLOW RATE(CFS) = 7212.17

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 115.36

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.788

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

NATURAL FAIR COVER

"GRASS" C 28.40 0.25 1.00 79

NATURAL FAIR COVER

"OPEN BRUSH" C 502.60 0.25 1.00 77

COMMERCIAL C 1.30 0.25 0.10 69

NATURAL FAIR COVER

"CHAPARRAL,NARROWLEAF" C 6.10 0.25 1.00 81

NATURAL FAIR COVER

"WOODLAND" C 9.90 0.25 1.00 73

NATURAL FAIR COVER

"CHAPARRAL,BROADLEAF" D 46.10 0.20 1.00 81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 594.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.36;30M= 0.65;1H= 0.92;3H= 1.79;6H= 2.73;24H= 4.88

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.92; LAG(HR) = 1.54; Fm(INCH/HR) = 0.23; Ybar = 0.47

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.47; 30M = 0.50; 1HR = 0.52;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 26564.11

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0341; Lca/L=0.4,n=.0306; Lca/L=0.5,n=.0281;Lca/L=0.6,n=.0262

TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 5669.87

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 6915.44

TOTAL AREA(ACRES) = 26564.11 PEAK FLOW RATE(CFS) = 7212.17

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 115.36

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.788

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

NATURAL FAIR COVER

"GRASS" D 30.10 0.20 1.00 84

NATURAL FAIR COVER

"OPEN BRUSH" D 129.80 0.20 1.00 83

COMMERCIAL D 1.70 0.20 0.10 75

NATURAL FAIR COVER

"CHAPARRAL,NARROWLEAF" D 38.00 0.20 1.00 86

NATURAL FAIR COVER

"WOODLAND" D 91.10 0.20 1.00 79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99

SUBAREA AREA(ACRES) = 290.70

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.36;30M= 0.65;1H= 0.92;3H= 1.79;6H= 2.72;24H= 4.86

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.92; LAG(HR) = 1.54; Fm(INCH/HR) = 0.23; Ybar = 0.47

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.47; 30M = 0.50; 1HR = 0.52;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96

UNIT-INTERVAL(MIN) = 15.00    TOTAL AREA(ACRES) = 26854.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0341; Lca/L=0.4,n=.0306; Lca/L=0.5,n=.0281;Lca/L=0.6,n=.0262  
TIME OF PEAK FLOW(HR) = 17.25    RUNOFF VOLUME(AF) = 5700.16  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 6948.80  
TOTAL AREA(ACRES) = 26854.80    PEAK FLOW RATE(CFS) = 7212.17  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES)        = 26854.80    TC(MIN.) = 115.36  
AREA-AVERAGED Fm(INCH/HR)= 0.23    Ybar = 0.47  
PEAK FLOW RATE(CFS)     = 7212.17

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LU61010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.130  
MOUNTAIN 0.660  
VALLEY(UNDEVELOPED)/DESERT 0.200  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1060.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU60010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 7212.17 Tc(MIN.) = 115.36  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.47  
TOTAL AREA(ACRES) = 26854.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1060.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 7212.17 Tc(MIN.) = 115.36  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.47  
TOTAL AREA(ACRES) = 26854.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1060.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 518.00 DOWNSTREAM(FEET) = 435.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 8004.00 CHANNEL SLOPE = 0.0104  
CHANNEL BASE(FEET) = 55.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 7212.17  
FLOW VELOCITY(FEET/SEC.) = 13.53 FLOW DEPTH(FEET) = 8.40  
TRAVEL TIME(MIN.) = 9.86 Tc(MIN.) = 125.22  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 125.22  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.641  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 72.70 0.40 1.00 40  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" A 9.10 0.40 0.50 32  
NATURAL POOR COVER  
"BARREN" A 0.20 0.40 1.00 78  
NATURAL FAIR COVER  
"GRASS" A 4.00 0.40 1.00 50  
NATURAL FAIR COVER  
"OPEN BRUSH" A 97.50 0.40 1.00 46  
COMMERCIAL A 8.10 0.40 0.10 32  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
SUBAREA AREA(ACRES) = 191.60  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.35;30M= 0.65;1H= 0.92;3H= 1.79;6H= 2.71;24H= 4.85

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.2%  
MOUNTAIN= 83.7%;FOOTHILL= 7.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.09; LAG(HR) = 1.67; Fm(INCH/HR) = 0.23; Ybar = 0.48  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.46; 30M = 0.50; 1HR = 0.52;  
3HR = 0.86; 6HR = 0.94; 24HR = 0.96  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 27046.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0262  
TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 5697.81  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 6823.82  
TOTAL AREA(ACRES) = 27046.40 PEAK FLOW RATE(CFS) = 7212.17  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.30; 30M = 0.62; 1HR = 0.84; 3HR = 1.52; 6HR = 2.22; 24HR = 3.85

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 125.22  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	A	8.70	0.40	1.00	55
NATURAL FAIR COVER					
"WOODLAND"	A	70.50	0.40	1.00	36
NATURAL FAIR COVER					
"GRASS"	B	0.80	0.30	1.00	69
NATURAL FAIR COVER					
"OPEN BRUSH"	B	18.30	0.30	1.00	66
COMMERCIAL	B	2.90	0.30	0.10	56
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	B	1.60	0.30	1.00	72

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.38  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97  
SUBAREA AREA(ACRES) = 102.80

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.35;30M= 0.65;1H= 0.92;3H= 1.78;6H= 2.71;24H= 4.85  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.2%  
MOUNTAIN= 83.6%;FOOTHILL= 7.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.09; LAG(HR) = 1.67; Fm(INCH/HR) = 0.23; Ybar = 0.48  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.46; 30M = 0.50; 1HR = 0.52;  
3HR = 0.86; 6HR = 0.94; 24HR = 0.96  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 27149.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0262  
TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 5696.65  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 6824.19  
TOTAL AREA(ACRES) = 27149.20 PEAK FLOW RATE(CFS) = 7212.17  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.30; 30M = 0.62; 1HR = 0.84; 3HR = 1.52; 6HR = 2.22; 24HR = 3.85

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 125.22  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	B	16.20	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	1119.80	0.25	1.00	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	17.10	0.25	0.50	69
NATURAL POOR COVER					
"BARREN"	C	18.20	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	128.60	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	739.90	0.25	1.00	77

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 2039.80

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.35;30M= 0.65;1H= 0.92;3H= 1.77;6H= 2.68;24H= 4.78  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 9.0%  
MOUNTAIN= 82.4%;FOOTHILL= 7.6%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.09; LAG(HR) = 1.67; Fm(INCH/HR) = 0.23; Ybar = 0.48  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.45; 30M = 0.49; 1HR = 0.51;  
3HR = 0.85; 6HR = 0.93; 24HR = 0.96  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 29189.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0262  
TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 5934.99  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7061.22  
TOTAL AREA(ACRES) = 29189.00 PEAK FLOW RATE(CFS) = 7212.17  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.30; 30M = 0.62; 1HR = 0.84; 3HR = 1.52; 6HR = 2.22; 24HR = 3.85

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 125.22  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	0.10	0.25	0.10	69
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	195.30	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	132.20	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	1067.40	0.20	1.00	81
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	23.60	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	34.20	0.20	1.00	93

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 1452.80

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.35;30M= 0.65;1H= 0.91;3H= 1.75;6H= 2.65;24H= 4.73

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 9.5%  
MOUNTAIN= 81.6%;FOOTHILL= 7.8%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.09; LAG(HR) = 1.67; Fm(INCH/HR) = 0.23; Ybar = 0.49  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.44; 30M = 0.48; 1HR = 0.50;  
3HR = 0.85; 6HR = 0.93; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 30641.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0262  
TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 6148.28  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7266.02  
TOTAL AREA(ACRES) = 30641.80 PEAK FLOW RATE(CFS) = 7266.02

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.30; 30M = 0.62; 1HR = 0.84; 3HR = 1.52; 6HR = 2.22; 24HR = 3.85

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 125.22

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	D	99.70	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	651.20	0.20	1.00	83
COMMERCIAL	D	3.60	0.20	0.10	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	574.70	0.20	1.00	86
NATURAL FAIR COVER					
"WOODLAND"	D	210.30	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 1539.50

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.35;30M= 0.65;1H= 0.91;3H= 1.74;6H= 2.63;24H= 4.69

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 10.0%

MOUNTAIN= 80.9%;FOOTHILL= 8.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.09; LAG(HR) = 1.67; Fm(INCH/HR) = 0.23; Ybar = 0.48

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.43; 30M = 0.47; 1HR = 0.49;

3HR = 0.84; 6HR = 0.93; 24HR= 0.96

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 32181.30

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0262

TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 6400.70

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7499.40

TOTAL AREA(ACRES) = 32181.30 PEAK FLOW RATE(CFS) = 7499.40

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.30; 30M = 0.62; 1HR = 0.84; 3HR = 1.52; 6HR = 2.22; 24HR = 3.85

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 32181.30 TC(MIN.) = 125.22

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.48

PEAK FLOW RATE(CFS) = 7499.40

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU62010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	5.100
2)	10.000;	3.100
3)	15.000;	2.500
4)	20.000;	1.800
5)	30.000;	1.350
6)	60.000;	1.000
7)	120.000;	0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.310  
MOUNTAIN 0.260  
VALLEY(UNDEVELOPED)/DESERT 0.420  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1061.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU61010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 7499.40 Tc(MIN.) = 125.22  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.48  
TOTAL AREA(ACRES) = 32181.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1061.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 7499.40 Tc(MIN.) = 125.22  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.48  
TOTAL AREA(ACRES) = 32181.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1061.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 435.00 DOWNSTREAM(FEET) = 345.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 8275.00 CHANNEL SLOPE = 0.0109  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 7499.40  
FLOW VELOCITY(FEET/SEC.) = 13.67 FLOW DEPTH(FEET) = 8.06  
TRAVEL TIME(MIN.) = 10.09 Tc(MIN.) = 135.31  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 135.31  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.613  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	36.50	0.40	1.00	40
NATURAL FAIR COVER					
"WOODLAND"	A	444.40	0.40	1.00	36
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	1.00	0.40	0.50	32
NATURAL POOR COVER					
"BARREN"	A	6.90	0.40	1.00	78
NATURAL FAIR COVER					
"GRASS"	A	60.30	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	2.20	0.40	1.00	44

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 551.30  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.35;30M= 0.65;1H= 0.91;3H= 1.74;6H= 2.63;24H= 4.67  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 10.6%  
 MOUNTAIN= 79.9%;FOOTHILL= 8.5%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.26; LAG(HR) = 1.80; Fm(INCH/HR) = 0.23; Ybar = 0.49  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.43; 30M = 0.46; 1HR = 0.49;  
 3HR = 0.84; 6HR = 0.93; 24HR= 0.96  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 32732.61  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0261  
 TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 6375.14  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7278.44  
 TOTAL AREA(ACRES) = 32732.61 PEAK FLOW RATE(CFS) = 7499.40  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.29; 30M = 0.61; 1HR = 0.83; 3HR = 1.48; 6HR = 2.14; 24HR = 3.69

\*\*\*\*\*

FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 135.31  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN FAIR COVER "TURF"	A	1.30	0.40	1.00	44
NATURAL FAIR COVER "OPEN BRUSH"	A	138.50	0.40	1.00	46
COMMERCIAL	A	5.60	0.40	0.10	32
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	A	1.80	0.40	1.00	55
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	13.80	0.30	1.00	63
AGRICULTURAL POOR COVER "FALLOW"	B	2.70	0.30	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.39  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97  
 SUBAREA AREA(ACRES) = 163.70  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.34;30M= 0.65;1H= 0.91;3H= 1.74;6H= 2.62;24H= 4.67  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 10.7%  
 MOUNTAIN= 79.7%;FOOTHILL= 8.6%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.26; LAG(HR) = 1.80; Fm(INCH/HR) = 0.23; Ybar = 0.49  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.42; 30M = 0.46; 1HR = 0.49;  
 3HR = 0.84; 6HR = 0.93; 24HR= 0.96  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 32896.30  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0261  
 TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 6372.72  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7276.97  
 TOTAL AREA(ACRES) = 32896.30 PEAK FLOW RATE(CFS) = 7499.40  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.29; 30M = 0.61; 1HR = 0.83; 3HR = 1.48; 6HR = 2.14; 24HR = 3.69

\*\*\*\*\*

FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 135.31  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	B	6.20	0.30	0.85	56
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	B	17.10	0.30	1.00	72
NATURAL FAIR COVER "WOODLAND"	B	74.10	0.30	1.00	60
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	1292.00	0.25	1.00	75
NATURAL FAIR COVER "WOODLAND"	C	636.80	0.25	1.00	73
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	6.90	0.25	0.50	69

\*\*\*\*\*

FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 135.31  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "5-7 DWELLINGS/ACRE"	B	2.30	0.30	0.50	56
NATURAL POOR COVER "BARREN"	B	5.00	0.30	1.00	86
NATURAL FAIR COVER "GRASS"	B	51.10	0.30	1.00	69
URBAN FAIR COVER "TURF"	B	10.00	0.30	1.00	65
NATURAL FAIR COVER "OPEN BRUSH"	B	258.20	0.30	1.00	66
COMMERCIAL	B	64.50	0.30	0.10	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.85  
 SUBAREA AREA(ACRES) = 391.10  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.34;30M= 0.65;1H= 0.91;3H= 1.73;6H= 2.62;24H= 4.66  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 11.1%  
 MOUNTAIN= 79.0%;FOOTHILL= 8.8%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.26; LAG(HR) = 1.80; Fm(INCH/HR) = 0.23; Ybar = 0.50  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.42; 30M = 0.46; 1HR = 0.49;  
 3HR = 0.84; 6HR = 0.93; 24HR= 0.96  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 33287.41  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0261  
 TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 6406.40  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7310.99  
 TOTAL AREA(ACRES) = 33287.41 PEAK FLOW RATE(CFS) = 7499.40  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.29; 30M = 0.61; 1HR = 0.83; 3HR = 1.48; 6HR = 2.14; 24HR = 3.69

\*\*\*\*\*

FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 135.31  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	B	6.20	0.30	0.85	56
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	B	17.10	0.30	1.00	72
NATURAL FAIR COVER "WOODLAND"	B	74.10	0.30	1.00	60
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	1292.00	0.25	1.00	75
NATURAL FAIR COVER "WOODLAND"	C	636.80	0.25	1.00	73
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	6.90	0.25	0.50	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 2033.10  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.34;30M= 0.64;1H= 0.90;3H= 1.72;6H= 2.59;24H= 4.60

\*\*\*\*\*

FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 135.31  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	B	6.20	0.30	0.85	56
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	B	17.10	0.30	1.00	72
NATURAL FAIR COVER "WOODLAND"	B	74.10	0.30	1.00	60
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	1292.00	0.25	1.00	75
NATURAL FAIR COVER "WOODLAND"	C	636.80	0.25	1.00	73
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	6.90	0.25	0.50	69

\*\*\*\*\*

FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 12.9%  
MOUNTAIN= 76.0%;FOOTHILL= 10.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.26; LAG(HR) = 1.80; Fm(INCH/HR) = 0.24; Ybar = 0.50  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.41; 30M = 0.45; 1HR = 0.48;  
3HR = 0.83; 6HR = 0.92; 24HR = 0.95  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 35320.51  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0261  
TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 6593.59  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7492.01  
TOTAL AREA(ACRES) = 35320.51 PEAK FLOW RATE(CFS) = 7499.40  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.29; 30M = 0.61; 1HR = 0.83; 3HR = 1.48; 6HR = 2.14; 24HR = 3.69

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 135.31

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER					
"BARREN"	C	40.70	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	190.10	0.25	1.00	79
URBAN FAIR COVER					
"TURF"	C	87.00	0.25	1.00	77
NATURAL FAIR COVER					
"OPEN BRUSH"	C	2310.80	0.25	1.00	77
COMMERCIAL	C	161.30	0.25	0.10	69
PUBLIC PARK	C	8.70	0.25	0.85	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95

SUBAREA AREA(ACRES) = 2798.60

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.34;30M= 0.64;1H= 0.90;3H= 1.70;6H= 2.56;24H= 4.53

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 15.0%

MOUNTAIN= 72.3%;FOOTHILL= 11.7%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.26; LAG(HR) = 1.80; Fm(INCH/HR) = 0.24; Ybar = 0.51

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.40; 30M = 0.44; 1HR = 0.47;

3HR = 0.82; 6HR = 0.92; 24HR = 0.95

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 38119.11

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0261

TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 6920.82

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7793.51

TOTAL AREA(ACRES) = 38119.11 PEAK FLOW RATE(CFS) = 7793.51

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.29; 30M = 0.61; 1HR = 0.83; 3HR = 1.48; 6HR = 2.14; 24HR = 3.69

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 135.31

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	389.30	0.25	1.00	81
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	1418.60	0.20	1.00	81
NATURAL FAIR COVER					
"MEADOWS"	D	3.10	0.20	1.00	84
NATURAL FAIR COVER					
"WOODLAND"	D	963.30	0.20	1.00	79
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	0.80	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	84.90	0.20	1.00	93

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 2860.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.33;30M= 0.64;1H= 0.89;3H= 1.69;6H= 2.53;24H= 4.48

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 16.9%

MOUNTAIN= 69.1%;FOOTHILL= 13.0%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.26; LAG(HR) = 1.80; Fm(INCH/HR) = 0.23; Ybar = 0.51

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.38; 30M = 0.43; 1HR = 0.46;

3HR = 0.81; 6HR = 0.92; 24HR = 0.95

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 40979.11

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0261

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 7296.49

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8192.21

TOTAL AREA(ACRES) = 40979.11 PEAK FLOW RATE(CFS) = 8192.21

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.29; 30M = 0.61; 1HR = 0.83; 3HR = 1.48; 6HR = 2.14; 24HR = 3.69

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 135.31

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	D	865.20	0.20	1.00	84
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	0.20	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	57.80	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	2760.50	0.20	1.00	83
COMMERCIAL	D	225.30	0.20	0.10	75
PUBLIC PARK	D	2.90	0.20	0.85	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95

SUBAREA AREA(ACRES) = 3911.90

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.33;30M= 0.64;1H= 0.89;3H= 1.67;6H= 2.49;24H= 4.41

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 19.1%

MOUNTAIN= 65.3%;FOOTHILL= 14.6%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.26; LAG(HR) = 1.80; Fm(INCH/HR) = 0.23; Ybar = 0.50

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.41; 1HR = 0.45;  
 3HR = 0.80; 6HR = 0.91; 24HR= 0.95  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 44891.01  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0261  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 7893.82  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8796.26  
 TOTAL AREA(ACRES) = 44891.01 PEAK FLOW RATE(CFS) = 8796.26

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.29; 30M = 0.61; 1HR = 0.83; 3HR = 1.48; 6HR = 2.14; 24HR = 3.69

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 135.31  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL GOOD COVER "MEADOWS"	D	0.20	0.20	1.00	78
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	1546.10	0.20	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1546.30

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.33;30M= 0.64;1H= 0.88;3H= 1.66;6H= 2.48;24H= 4.38  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 19.9%  
 MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.26; LAG(HR) = 1.80; Fm(INCH/HR) = 0.23; Ybar = 0.50  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.41; 1HR = 0.44;  
 3HR = 0.79; 6HR = 0.91; 24HR= 0.95

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 46437.31  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0340; Lca/L=0.4,n=.0305; Lca/L=0.5,n=.0280;Lca/L=0.6,n=.0261  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 8143.72  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9034.05  
 TOTAL AREA(ACRES) = 46437.31 PEAK FLOW RATE(CFS) = 9034.05

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.29; 30M = 0.61; 1HR = 0.83; 3HR = 1.48; 6HR = 2.14; 24HR = 3.69

=====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 46437.31 TC(MIN.) = 135.31  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.50  
 PEAK FLOW RATE(CFS) = 9034.05

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

**PRELIMINARY DRAFT – FOR INTERNAL USE ONLY**

**TECHNICAL APPENDIX I-A  
HYDROLOGIC ANALYSIS  
UPSTREAM AREAS  
100-YEAR EXPECTED VALUE**

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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-----  
FILE NAME: LU35100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.000  
FOOTHILL 0.030  
MOUNTAIN 0.920  
VALLEY(UNDEVELOPED)/DESERT 0.050  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1000.00 TO NODE 1001.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00  
ELEVATION DATA: UPSTREAM(FEET) = 3210.00 DOWNSTREAM(FEET) = 3190.00  
  
 $T_c = K * [(LENGTH ** 3.00) / (ELEVATION CHANGE)] ** 0.20$   
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.581  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.647  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1.30 0.25 1.00 75 12.58  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA RUNOFF(CFS) = 3.97  
TOTAL AREA(ACRES) = 1.30 PEAK FLOW RATE(CFS) = 3.97

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1001.00 TO NODE 1002.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3190.00 DOWNSTREAM(FEET) = 3175.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 154.00 CHANNEL SLOPE = 0.0974  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 3.97  
FLOW VELOCITY(FEET/SEC.) = 4.53 FLOW DEPTH(FEET) = 0.56  
TRAVEL TIME(MIN.) = 0.57 Tc(MIN.) = 13.15  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1002.00 = 484.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1001.00 TO NODE 1002.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 13.15  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.871  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1.20 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1.20 SUBAREA RUNOFF(CFS) = 3.91  
EFFECTIVE AREA(ACRES) = 2.50 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2.50 PEAK FLOW RATE(CFS) = 8.15

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1002.00 TO NODE 1003.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3175.00 DOWNSTREAM(FEET) = 3160.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 136.00 CHANNEL SLOPE = 0.1103  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000

MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 8.15  
FLOW VELOCITY(FEET/SEC.) = 5.69 FLOW DEPTH(FEET) = 0.80  
TRAVEL TIME(MIN.) = 0.40 Tc(MIN.) = 13.55  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1003.00 = 620.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1002.00 TO NODE 1003.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 13.55  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.791  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 0.30 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 2.10 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 2.40 SUBAREA RUNOFF(CFS) = 7.63  
EFFECTIVE AREA(ACRES) = 4.90 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4.90 PEAK FLOW RATE(CFS) = 15.60

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1003.00 TO NODE 1004.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3160.00 DOWNSTREAM(FEET) = 3120.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 357.00 CHANNEL SLOPE = 0.1120  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 15.60  
FLOW VELOCITY(FEET/SEC.) = 6.60 FLOW DEPTH(FEET) = 0.83  
TRAVEL TIME(MIN.) = 0.90 Tc(MIN.) = 14.45  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1004.00 = 977.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1003.00 TO NODE 1004.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 14.45  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.611  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 0.10 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 3.20 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 3.30 SUBAREA RUNOFF(CFS) = 9.98  
EFFECTIVE AREA(ACRES) = 8.20 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 8.20 PEAK FLOW RATE(CFS) = 24.78

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1004.00 TO NODE 1005.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3120.00 DOWNSTREAM(FEET) = 3100.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 332.00 CHANNEL SLOPE = 0.0602  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 24.78  
FLOW VELOCITY(FEET/SEC.) = 5.97 FLOW DEPTH(FEET) = 1.27  
TRAVEL TIME(MIN.) = 0.93 Tc(MIN.) = 15.37  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1005.00 = 1309.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1004.00 TO NODE 1005.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 15.37  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.444  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 5.50 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 5.50 SUBAREA RUNOFF(CFS) = 15.81  
EFFECTIVE AREA(ACRES) = 13.70 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 13.70 PEAK FLOW RATE(CFS) = 39.36

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1005.00 TO NODE 1006.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3100.00 DOWNSTREAM(FEET) = 3080.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 195.00 CHANNEL SLOPE = 0.1026  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 39.36  
FLOW VELOCITY(FEET/SEC.) = 8.21 FLOW DEPTH(FEET) = 1.41  
TRAVEL TIME(MIN.) = 0.40 Tc(MIN.) = 15.77  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1006.00 = 1504.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1005.00 TO NODE 1006.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 15.77  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.385  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 7.80 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 7.80 SUBAREA RUNOFF(CFS) = 22.00

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EFFECTIVE AREA(ACRES) = 21.50 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 21.50 PEAK FLOW RATE(CFS) = 60.64

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

*****
FLOW PROCESS FROM NODE 1006.00 TO NODE 1007.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3080.00 DOWNSTREAM(FEET) = 3075.00
CHANNEL LENGTH THRU SUBAREA( FEET) = 220.00 CHANNEL SLOPE = 0.0227
CHANNEL BASE( FEET) = 3.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH( FEET) = 3.00
CHANNEL FLOW THRU SUBAREA( CFS) = 60.64
FLOW VELOCITY( FEET/SEC.) = 5.20 FLOW DEPTH( FEET) = 2.23
TRAVEL TIME( MIN.) = 0.71 Tc( MIN.) = 16.48
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1007.00 = 1724.00 FEET.

*****
FLOW PROCESS FROM NODE 1006.00 TO NODE 1007.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc( MIN) = 16.48
* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 3.279
SUBAREA LOSS RATE DATA( AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 10.10 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA( ACRES) = 10.10 SUBAREA RUNOFF( CFS) = 27.53
EFFECTIVE AREA( ACRES) = 31.60 AREA-AVERAGED Fm( INCH/HR) = 0.25
AREA-AVERAGED Fp( INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00
TOTAL AREA( ACRES) = 31.60 PEAK FLOW RATE( CFS) = 86.12

SUBAREA AREA-AVERAGED RAINFALL DEPTH( INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

*****
FLOW PROCESS FROM NODE 1007.00 TO NODE 1008.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM( FEET) = 3075.00 DOWNSTREAM( FEET) = 3060.00
CHANNEL LENGTH THRU SUBAREA( FEET) = 340.00 CHANNEL SLOPE = 0.0441
CHANNEL BASE( FEET) = 3.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH( FEET) = 3.00
CHANNEL FLOW THRU SUBAREA( CFS) = 86.12
FLOW VELOCITY( FEET/SEC.) = 7.30 FLOW DEPTH( FEET) = 2.25
TRAVEL TIME( MIN.) = 0.78 Tc( MIN.) = 17.25
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1008.00 = 2064.00 FEET.

*****
FLOW PROCESS FROM NODE 1007.00 TO NODE 1008.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc( MIN) = 17.25
* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 3.162
SUBAREA LOSS RATE DATA( AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

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LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B 14.60 0.30 1.00 63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 4.60 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.29
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA( ACRES) = 19.20 SUBAREA RUNOFF( CFS) = 49.67
EFFECTIVE AREA( ACRES) = 50.80 AREA-AVERAGED Fm( INCH/HR) = 0.26
AREA-AVERAGED Fp( INCH/HR) = 0.26 AREA-AVERAGED Ap = 1.00
TOTAL AREA( ACRES) = 50.80 PEAK FLOW RATE( CFS) = 132.48

SUBAREA AREA-AVERAGED RAINFALL DEPTH( INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

*****
FLOW PROCESS FROM NODE 1008.00 TO NODE 1009.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM( FEET) = 3060.00 DOWNSTREAM( FEET) = 3040.00
CHANNEL LENGTH THRU SUBAREA( FEET) = 409.00 CHANNEL SLOPE = 0.0489
CHANNEL BASE( FEET) = 4.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH( FEET) = 4.00
CHANNEL FLOW THRU SUBAREA( CFS) = 132.48
FLOW VELOCITY( FEET/SEC.) = 8.40 FLOW DEPTH( FEET) = 2.45
TRAVEL TIME( MIN.) = 0.81 Tc( MIN.) = 18.06
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1009.00 = 2473.00 FEET.

*****
FLOW PROCESS FROM NODE 1008.00 TO NODE 1009.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc( MIN) = 18.06
* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 3.041
SUBAREA LOSS RATE DATA( AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B 9.60 0.30 1.00 63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 22.90 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp( INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA( ACRES) = 32.50 SUBAREA RUNOFF( CFS) = 81.19
EFFECTIVE AREA( ACRES) = 83.30 AREA-AVERAGED Fm( INCH/HR) = 0.26
AREA-AVERAGED Fp( INCH/HR) = 0.26 AREA-AVERAGED Ap = 1.00
TOTAL AREA( ACRES) = 83.30 PEAK FLOW RATE( CFS) = 208.10

SUBAREA AREA-AVERAGED RAINFALL DEPTH( INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

*****
FLOW PROCESS FROM NODE 1009.00 TO NODE 1010.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM( FEET) = 3040.00 DOWNSTREAM( FEET) = 3000.00
CHANNEL LENGTH THRU SUBAREA( FEET) = 1354.00 CHANNEL SLOPE = 0.0295
CHANNEL BASE( FEET) = 5.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH( FEET) = 5.00
CHANNEL FLOW THRU SUBAREA( CFS) = 208.10
FLOW VELOCITY( FEET/SEC.) = 7.80 FLOW DEPTH( FEET) = 3.24
TRAVEL TIME( MIN.) = 2.89 Tc( MIN.) = 20.96
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1010.00 = 3827.00 FEET.

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*****
FLOW PROCESS FROM NODE 1009.00 TO NODE 1010.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 20.96
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.688
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  B      22.50   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  C      20.80   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.28
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 43.30   SUBAREA RUNOFF(CFS) = 93.99
EFFECTIVE AREA(ACRES) = 126.60   AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27   AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 126.60   PEAK FLOW RATE(CFS) = 275.64

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76
*****
FLOW PROCESS FROM NODE 1010.00 TO NODE 1011.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3000.00   DOWNSTREAM(FEET) = 2960.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1293.00   CHANNEL SLOPE = 0.0309
CHANNEL BASE(FEET) = 5.00   "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) = 5.00
CHANNEL FLOW THRU SUBAREA(CFS) = 275.64
FLOW VELOCITY(FEET/SEC.) = 8.53   FLOW DEPTH(FEET) = 3.71
TRAVEL TIME(MIN.) = 2.53   Tc(MIN.) = 23.48
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1011.00 = 5120.00 FEET.
*****
FLOW PROCESS FROM NODE 1010.00 TO NODE 1011.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 23.48
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.524
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  B      24.80   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  C      52.80   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 77.60   SUBAREA RUNOFF(CFS) = 157.67
EFFECTIVE AREA(ACRES) = 204.20   AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27   AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 204.20   PEAK FLOW RATE(CFS) = 414.59

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76
*****
FLOW PROCESS FROM NODE 1011.00 TO NODE 1012.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

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>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2960.00   DOWNSTREAM(FEET) = 2940.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 900.00   CHANNEL SLOPE = 0.0222
CHANNEL BASE(FEET) = 6.00   "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) = 6.00
CHANNEL FLOW THRU SUBAREA(CFS) = 414.59
FLOW VELOCITY(FEET/SEC.) = 8.35   FLOW DEPTH(FEET) = 4.66
TRAVEL TIME(MIN.) = 1.80   Tc(MIN.) = 25.28
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1012.00 = 6020.00 FEET.
*****
FLOW PROCESS FROM NODE 1011.00 TO NODE 1012.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 25.28
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.407
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  B      10.90   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  C      15.10   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 26.00   SUBAREA RUNOFF(CFS) = 49.98
EFFECTIVE AREA(ACRES) = 230.20   AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27   AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 230.20   PEAK FLOW RATE(CFS) = 443.12

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76
*****
FLOW PROCESS FROM NODE 1012.00 TO NODE 1013.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2940.00   DOWNSTREAM(FEET) = 2920.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 830.00   CHANNEL SLOPE = 0.0241
CHANNEL BASE(FEET) = 6.00   "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050   MAXIMUM DEPTH(FEET) = 6.00
CHANNEL FLOW THRU SUBAREA(CFS) = 443.12
FLOW VELOCITY(FEET/SEC.) = 8.76   FLOW DEPTH(FEET) = 4.72
TRAVEL TIME(MIN.) = 1.58   Tc(MIN.) = 26.86
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1013.00 = 6850.00 FEET.
*****
FLOW PROCESS FROM NODE 1012.00 TO NODE 1013.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 26.86
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.304
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP  (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  B      3.20   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF"  C      21.50   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 24.70   SUBAREA RUNOFF(CFS) = 45.52
EFFECTIVE AREA(ACRES) = 254.90   AREA-AVERAGED Fm(INCH/HR) = 0.27

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AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 254.90 PEAK FLOW RATE(CFS) = 467.37

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

*****
FLOW PROCESS FROM NODE 1013.00 TO NODE 1014.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2920.00 DOWNSTREAM(FEET) = 2905.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 564.00 CHANNEL SLOPE = 0.0266
CHANNEL BASE(FEET) = 6.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 6.00
CHANNEL FLOW THRU SUBAREA(CFS) = 467.37
FLOW VELOCITY(FEET/SEC.) = 9.22 FLOW DEPTH(FEET) = 4.73
TRAVEL TIME(MIN.) = 1.02 Tc(MIN.) = 27.88
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1014.00 = 7414.00 FEET.

*****
FLOW PROCESS FROM NODE 1013.00 TO NODE 1014.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 27.88
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.238
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B 79.00 0.30 1.00 63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 2.90 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 81.90 SUBAREA RUNOFF(CFS) = 142.97
EFFECTIVE AREA(ACRES) = 336.80 AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 336.80 PEAK FLOW RATE(CFS) = 595.13

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

*****
FLOW PROCESS FROM NODE 1014.00 TO NODE 1015.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2905.00 DOWNSTREAM(FEET) = 2880.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 901.00 CHANNEL SLOPE = 0.0277
CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00
CHANNEL FLOW THRU SUBAREA(CFS) = 595.13
FLOW VELOCITY(FEET/SEC.) = 9.92 FLOW DEPTH(FEET) = 5.00
TRAVEL TIME(MIN.) = 1.51 Tc(MIN.) = 29.39
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1015.00 = 8315.00 FEET.

*****
FLOW PROCESS FROM NODE 1014.00 TO NODE 1015.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 29.39
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.139
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B 1.80 0.30 1.00 63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 14.10 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AREA(ACRES) = 15.90 SUBAREA RUNOFF(CFS) = 26.96
EFFECTIVE AREA(ACRES) = 352.70 AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 352.70 PEAK FLOW RATE(CFS) = 595.13
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

*****
FLOW PROCESS FROM NODE 1015.00 TO NODE 1035.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2880.00 DOWNSTREAM(FEET) = 2840.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1895.00 CHANNEL SLOPE = 0.0211
CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00
CHANNEL FLOW THRU SUBAREA(CFS) = 595.13
FLOW VELOCITY(FEET/SEC.) = 8.97 FLOW DEPTH(FEET) = 5.37
TRAVEL TIME(MIN.) = 3.52 Tc(MIN.) = 32.92
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

*****
FLOW PROCESS FROM NODE 1015.00 TO NODE 1035.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 32.92
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.044
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B 8.00 0.30 1.00 63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 28.80 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 36.80 SUBAREA RUNOFF(CFS) = 59.05
EFFECTIVE AREA(ACRES) = 389.50 AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 389.50 PEAK FLOW RATE(CFS) = 620.89

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

*****
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 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.) = 32.92
RAINFALL INTENSITY(INCH/HR) = 2.04
AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27
AREA-AVERAGED Ap = 1.00

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EFFECTIVE STREAM AREA(ACRES) = 389.50  
TOTAL STREAM AREA(ACRES) = 389.50  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 620.89

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1020.00 TO NODE 1021.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00  
ELEVATION DATA: UPSTREAM(FEET) = 3525.00 DOWNSTREAM(FEET) = 3485.00

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.952  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.310  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 0.70 0.30 1.00 63 10.95  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.30 0.20 1.00 81 10.95  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA RUNOFF(CFS) = 3.64  
TOTAL AREA(ACRES) = 1.00 PEAK FLOW RATE(CFS) = 3.64

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1021.00 TO NODE 1022.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----  
ELEVATION DATA: UPSTREAM(FEET) = 3485.00 DOWNSTREAM(FEET) = 3440.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 191.00 CHANNEL SLOPE = 0.2356  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 3.64  
FLOW VELOCITY(FEET/SEC.) = 6.05 FLOW DEPTH(FEET) = 0.42  
TRAVEL TIME(MIN.) = 0.53 Tc(MIN.) = 11.48  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1022.00 = 521.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1021.00 TO NODE 1022.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
-----  
MAINLINE Tc(MIN) = 11.48  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.204  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 0.10 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.80 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 0.90 SUBAREA RUNOFF(CFS) = 3.23  
EFFECTIVE AREA(ACRES) = 1.90 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1.90 PEAK FLOW RATE(CFS) = 6.78

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1022.00 TO NODE 1023.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----  
ELEVATION DATA: UPSTREAM(FEET) = 3440.00 DOWNSTREAM(FEET) = 3400.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 227.00 CHANNEL SLOPE = 0.1762  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 6.78  
FLOW VELOCITY(FEET/SEC.) = 6.48 FLOW DEPTH(FEET) = 0.64  
TRAVEL TIME(MIN.) = 0.58 Tc(MIN.) = 12.06  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1023.00 = 748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1022.00 TO NODE 1023.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
-----  
MAINLINE Tc(MIN) = 12.06  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.088  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 1.20 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1.20 SUBAREA RUNOFF(CFS) = 4.20  
EFFECTIVE AREA(ACRES) = 3.10 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3.10 PEAK FLOW RATE(CFS) = 10.77

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1023.00 TO NODE 1024.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----  
ELEVATION DATA: UPSTREAM(FEET) = 3400.00 DOWNSTREAM(FEET) = 3280.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 160.00 CHANNEL SLOPE = 0.7500  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 10.77  
FLOW VELOCITY(FEET/SEC.) = 12.51 FLOW DEPTH(FEET) = 0.55  
TRAVEL TIME(MIN.) = 0.21 Tc(MIN.) = 12.28  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1024.00 = 908.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1023.00 TO NODE 1024.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
-----  
MAINLINE Tc(MIN) = 12.28  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.045  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 0.10 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.60 0.20 1.00 81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 0.70 SUBAREA RUNOFF(CFS) = 2.42  
EFFECTIVE AREA(ACRES) = 3.80 AREA-AVERAGED Fm(INCH/HR) = 0.22  
AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3.80 PEAK FLOW RATE(CFS) = 13.07

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1024.00 TO NODE 1025.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3280.00 DOWNSTREAM(FEET) = 3240.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 138.00 CHANNEL SLOPE = 0.2899  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 13.07  
FLOW VELOCITY(FEET/SEC.) = 9.23 FLOW DEPTH(FEET) = 0.79  
TRAVEL TIME(MIN.) = 0.25 Tc(MIN.) = 12.52  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1025.00 = 1046.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1024.00 TO NODE 1025.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

-----  
MAINLINE Tc(MIN) = 12.52  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.995  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 2.80 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.30 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 3.10 SUBAREA RUNOFF(CFS) = 10.46  
EFFECTIVE AREA(ACRES) = 6.90 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 6.90 PEAK FLOW RATE(CFS) = 23.37

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1025.00 TO NODE 1026.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3240.00 DOWNSTREAM(FEET) = 3200.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 200.00 CHANNEL SLOPE = 0.2000  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 23.37  
FLOW VELOCITY(FEET/SEC.) = 9.11 FLOW DEPTH(FEET) = 0.89  
TRAVEL TIME(MIN.) = 0.37 Tc(MIN.) = 12.89  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1026.00 = 1246.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1025.00 TO NODE 1026.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

-----  
MAINLINE Tc(MIN) = 12.89  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.922  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1.50 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 1.80 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 3.30 SUBAREA RUNOFF(CFS) = 10.99  
EFFECTIVE AREA(ACRES) = 10.20 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 10.20 PEAK FLOW RATE(CFS) = 33.90

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1026.00 TO NODE 1027.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3200.00 DOWNSTREAM(FEET) = 3120.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 477.00 CHANNEL SLOPE = 0.1677  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 33.90  
FLOW VELOCITY(FEET/SEC.) = 9.45 FLOW DEPTH(FEET) = 1.14  
TRAVEL TIME(MIN.) = 0.84 Tc(MIN.) = 13.73  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1027.00 = 1723.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1026.00 TO NODE 1027.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

-----  
MAINLINE Tc(MIN) = 13.73  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.754  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 3.90 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 3.10 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 7.00 SUBAREA RUNOFF(CFS) = 22.21  
EFFECTIVE AREA(ACRES) = 17.20 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 17.20 PEAK FLOW RATE(CFS) = 54.57

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1027.00 TO NODE 1028.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3120.00 DOWNSTREAM(FEET) = 3100.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 273.00 CHANNEL SLOPE = 0.0733  
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000

MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 54.57  
FLOW VELOCITY(FEET/SEC.) = 7.78 FLOW DEPTH(FEET) = 1.54  
TRAVEL TIME(MIN.) = 0.59 Tc(MIN.) = 14.32  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1028.00 = 1996.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1027.00 TO NODE 1028.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 14.32  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.637  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 2.70 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.50 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 3.20 SUBAREA RUNOFF(CFS) = 9.78  
EFFECTIVE AREA(ACRES) = 20.40 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 20.40 PEAK FLOW RATE(CFS) = 62.53

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1028.00 TO NODE 1029.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3100.00 DOWNSTREAM(FEET) = 3080.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 212.00 CHANNEL SLOPE = 0.0943  
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 62.53  
FLOW VELOCITY(FEET/SEC.) = 8.85 FLOW DEPTH(FEET) = 1.55  
TRAVEL TIME(MIN.) = 0.40 Tc(MIN.) = 14.72  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1029.00 = 2208.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1028.00 TO NODE 1029.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 14.72  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.557  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 4.60 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 4.40 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 8.70 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 17.70 SUBAREA RUNOFF(CFS) = 52.86  
EFFECTIVE AREA(ACRES) = 38.10 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 38.10 PEAK FLOW RATE(CFS) = 113.93

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1029.00 TO NODE 1030.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3080.00 DOWNSTREAM(FEET) = 3000.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 781.00 CHANNEL SLOPE = 0.1024  
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 113.93  
FLOW VELOCITY(FEET/SEC.) = 10.69 FLOW DEPTH(FEET) = 2.09  
TRAVEL TIME(MIN.) = 1.22 Tc(MIN.) = 15.93  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1030.00 = 2989.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1029.00 TO NODE 1030.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 15.93  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.360  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 24.90 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 6.60 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 31.50 SUBAREA RUNOFF(CFS) = 88.47  
EFFECTIVE AREA(ACRES) = 69.60 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 69.60 PEAK FLOW RATE(CFS) = 195.64

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1030.00 TO NODE 1031.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3000.00 DOWNSTREAM(FEET) = 2980.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 392.00 CHANNEL SLOPE = 0.0510  
CHANNEL BASE(FEET) = 4.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 4.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 195.64  
FLOW VELOCITY(FEET/SEC.) = 9.45 FLOW DEPTH(FEET) = 2.97  
TRAVEL TIME(MIN.) = 0.69 Tc(MIN.) = 16.62  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1031.00 = 3381.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1030.00 TO NODE 1031.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 16.62  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.256  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER

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"CHAPARRAL,BROADLEAF" C 53.50 0.25 1.00 75
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" D 2.40 0.20 1.00 81
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 55.90 SUBAREA RUNOFF(CFS) = 151.35
EFFECTIVE AREA(ACRES) = 125.50 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 125.50 PEAK FLOW RATE(CFS) = 340.50

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

*****
FLOW PROCESS FROM NODE 1031.00 TO NODE 1032.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2980.00 DOWNSTREAM(FEET) = 2920.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1552.00 CHANNEL SLOPE = 0.0387
CHANNEL BASE(FEET) = 5.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 5.00
CHANNEL FLOW THRU SUBAREA(CFS) = 340.50
FLOW VELOCITY(FEET/SEC.) = 9.80 FLOW DEPTH(FEET) = 3.90
TRAVEL TIME(MIN.) = 2.64 Tc(MIN.) = 19.26
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1032.00 = 4933.00 FEET.

*****
FLOW PROCESS FROM NODE 1031.00 TO NODE 1032.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 19.26
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.860
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 65.60 0.25 1.00 75
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" D 44.00 0.20 1.00 81
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 109.60 SUBAREA RUNOFF(CFS) = 259.46
EFFECTIVE AREA(ACRES) = 235.10 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 235.10 PEAK FLOW RATE(CFS) = 555.23

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

*****
FLOW PROCESS FROM NODE 1032.00 TO NODE 1033.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2920.00 DOWNSTREAM(FEET) = 2900.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 976.00 CHANNEL SLOPE = 0.0205
CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00
CHANNEL FLOW THRU SUBAREA(CFS) = 555.23
FLOW VELOCITY(FEET/SEC.) = 8.71 FLOW DEPTH(FEET) = 5.22
TRAVEL TIME(MIN.) = 1.87 Tc(MIN.) = 21.13
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1033.00 = 5909.00 FEET.

*****

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FLOW PROCESS FROM NODE 1032.00 TO NODE 1033.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 21.13
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.676
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 35.60 0.25 1.00 75
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" D 0.60 0.20 1.00 81
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 36.20 SUBAREA RUNOFF(CFS) = 79.08
EFFECTIVE AREA(ACRES) = 271.30 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 271.30 PEAK FLOW RATE(CFS) = 595.42

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

*****
FLOW PROCESS FROM NODE 1033.00 TO NODE 1034.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2900.00 DOWNSTREAM(FEET) = 2880.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 942.00 CHANNEL SLOPE = 0.0212
CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00
CHANNEL FLOW THRU SUBAREA(CFS) = 595.42
FLOW VELOCITY(FEET/SEC.) = 8.99 FLOW DEPTH(FEET) = 5.36
TRAVEL TIME(MIN.) = 1.75 Tc(MIN.) = 22.88
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1034.00 = 6851.00 FEET.

*****
FLOW PROCESS FROM NODE 1033.00 TO NODE 1034.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 22.88
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.563
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 30.50 0.25 1.00 75
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" D 1.20 0.20 1.00 81
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 31.70 SUBAREA RUNOFF(CFS) = 66.04
EFFECTIVE AREA(ACRES) = 303.00 AREA-AVERAGED Fm(INCH/HR) = 0.24
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 303.00 PEAK FLOW RATE(CFS) = 633.73

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

*****
FLOW PROCESS FROM NODE 1034.00 TO NODE 1035.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----

```

ELEVATION DATA: UPSTREAM(FEET) = 2880.00 DOWNSTREAM(FEET) = 2840.00  
 CHANNEL LENGTH THRU SUBAREA(FEET) = 1097.00 CHANNEL SLOPE = 0.0365  
 CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000  
 MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 633.73  
 FLOW VELOCITY(FEET/SEC.) = 11.16 FLOW DEPTH(FEET) = 4.81  
 TRAVEL TIME(MIN.) = 1.64 Tc(MIN.) = 24.52  
 LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1035.00 = 7948.00 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 1034.00 TO NODE 1035.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 24.52  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.456  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	1.20	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	113.90	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	18.60	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 133.70 SUBAREA RUNOFF(CFS) = 266.28  
 EFFECTIVE AREA(ACRES) = 436.70 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 436.70 PEAK FLOW RATE(CFS) = 870.96

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

\*\*\*\*\*

FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 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.) = 24.52  
 RAINFALL INTENSITY(INCH/HR) = 2.46  
 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.24  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 436.70  
 TOTAL STREAM AREA(ACRES) = 436.70  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 870.96

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	620.89	32.92	2.044	0.27( 0.27)	1.00	389.5	1000.00
2	870.96	24.52	2.456	0.24( 0.24)	1.00	436.7	1020.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	1441.21	24.52	2.456	0.25( 0.25)	1.00	726.8	1020.00
2	1329.63	32.92	2.044	0.26( 0.26)	1.00	826.2	1000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

PEAK FLOW RATE(CFS) = 1441.21 Tc(MIN.) = 24.52  
 EFFECTIVE AREA(ACRES) = 726.82 AREA-AVERAGED Fm(INCH/HR) = 0.25  
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 826.20  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

\*\*\*\*\*

FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 7

>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<<<<<

>>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<<<<<

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.63;30M= 1.04;1H= 1.51;3H= 3.08;6H= 4.81;24H= 8.76  
 S-GRAPH: VALLEY(DEV.)= 0.0%;VALLEY(UNDEV.)/DESERT= 5.0%  
 MOUNTAIN= 92.0%;FOOTHILL= 3.0%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 0.55; LAG(HR) = 0.44; Fm(INCH/HR) = 0.26; Ybar = 0.37  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;  
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 826.20  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0475; Lca/L=0.4,n=.0426; Lca/L=0.5,n=.0391;Lca/L=0.6,n=.0365  
 TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 403.23  
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) = 1321.11  
 TOTAL PEAK FLOW RATE(CFS) = 1321.11 (SOURCE FLOW INCLUDED)  
 RATIONAL METHOD PEAK FLOW RATE(CFS) = 1441.21  
 (UPSTREAM NODE PEAK FLOW RATE(CFS) = 1441.21)  
 PEAK FLOW RATE(CFS) USED = 1441.21

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 826.20 TC(MIN.) = 32.92  
 AREA-AVERAGED Fm(INCH/HR)= 0.26 Ybar = 0.37  
 PEAK FLOW RATE(CFS) = 1441.21

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU36100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.170  
FOOTHILL 0.030  
MOUNTAIN 0.750  
VALLEY(UNDEVELOPED)/DESERT 0.050  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU35100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1441.21 Tc(MIN.) = 32.92  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.37  
TOTAL AREA(ACRES) = 826.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1441.21 Tc(MIN.) = 32.92  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.37  
TOTAL AREA(ACRES) = 826.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1036.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2840.00 DOWNSTREAM(FEET) = 2800.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1878.00 CHANNEL SLOPE = 0.0213  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1441.21  
FLOW VELOCITY(FEET/SEC.) = 13.23 FLOW DEPTH(FEET) = 6.57  
TRAVEL TIME(MIN.) = 2.37 Tc(MIN.) = 35.28  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1036.00 = 12088.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1036.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 35.28  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.020  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 31.30 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 21.90 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.28  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 53.20  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.04;1H= 1.51;3H= 3.08;6H= 4.81;24H= 8.76  
S-GRAPH: VALLEY(DEV.)= 0.0%;VALLEY(UNDEV.)/DESERT= 5.0%  
MOUNTAIN= 91.0%;FOOTHILL= 3.0%;DESERT(UNDEV.)= 1.0%  
Tc(HR) = 0.59; LAG(HR) = 0.47; Fm(INCH/HR) = 0.26; Ybar = 0.38  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;  
3HR = 0.99; 6HR = 1.00; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 879.40



LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1036.00 = 12088.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0442; Lca/L=0.4,n=.0396; Lca/L=0.5,n=.0364;Lca/L=0.6,n=.0340  
TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 427.01  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1331.13  
TOTAL AREA(ACRES) = 879.40 PEAK FLOW RATE(CFS) = 1441.21  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 879.40 TC(MIN.) = 35.28  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.38  
PEAK FLOW RATE(CFS) = 1441.21

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU37100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.130  
MOUNTAIN 0.710  
VALLEY(UNDEVELOPED)/DESERT 0.150  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1036.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU36100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1441.21 Tc(MIN.) = 35.28  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.38  
TOTAL AREA(ACRES) = 879.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1036.00 = 12088.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1036.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1441.21 Tc(MIN.) = 35.28  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.38  
TOTAL AREA(ACRES) = 879.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1036.00 = 12088.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1036.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1037.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2800.00 DOWNSTREAM(FEET) = 2760.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1959.00 CHANNEL SLOPE = 0.0204  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1441.21  
FLOW VELOCITY(FEET/SEC.) = 13.02 FLOW DEPTH(FEET) = 6.65  
TRAVEL TIME(MIN.) = 2.51 Tc(MIN.) = 37.79  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1037.00 = 14047.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1037.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 37.79  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.942  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 40.40 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 56.40 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 96.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.04;1H= 1.51;3H= 3.08;6H= 4.81;24H= 8.76  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.63; LAG(HR) = 0.50; Fm(INCH/HR) = 0.26; Ybar = 0.38  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;  
3HR = 0.99; 6HR = 1.00; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 976.20

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1037.00 = 14047.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0418; Lca/L=0.4,n=.0375; Lca/L=0.5,n=.0344;Lca/L=0.6,n=.0321  
TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 471.77  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1378.88  
TOTAL AREA(ACRES) = 976.20 PEAK FLOW RATE(CFS) = 1441.21  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 976.20 TC(MIN.) = 37.79  
AREA-AVERAGED Fm(INCH/HR)= 0.26 Ybar = 0.38  
PEAK FLOW RATE(CFS) = 1441.21

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU38100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	7.600
2)	10.000;	4.500
3)	15.000;	3.500
4)	20.000;	2.750
5)	30.000;	2.100
6)	60.000;	1.520
7)	120.000;	1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)

VALLEY(DEVELOPED)	0.010
FOOTHILL	0.040
MOUNTAIN	0.890
VALLEY(UNDEVELOPED)/DESERT	0.060
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1037.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU37100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1441.21 Tc(MIN.) = 37.79  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.38  
TOTAL AREA(ACRES) = 976.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1037.00 = 14047.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1037.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1441.21 Tc(MIN.) = 37.79  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.38  
TOTAL AREA(ACRES) = 976.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1037.00 = 14047.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1037.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1038.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2760.00 DOWNSTREAM(FEET) = 2700.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2116.00 CHANNEL SLOPE = 0.0284  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1441.21  
FLOW VELOCITY(FEET/SEC.) = 14.70 FLOW DEPTH(FEET) = 6.09  
TRAVEL TIME(MIN.) = 2.40 Tc(MIN.) = 40.19  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1038.00 = 16163.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1038.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 40.19  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.874  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	17.10	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	137.10	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	11.50	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 165.70  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.04;1H= 1.51;3H= 3.08;6H= 4.81;24H= 8.76  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.67; LAG(HR) = 0.54; Fm(INCH/HR) = 0.26; Ybar = 0.38  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;

3HR = 0.99; 6HR = 1.00; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1141.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1038.00 = 16163.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0398; Lca/L=0.4,n=.0357; Lca/L=0.5,n=.0328;Lca/L=0.6,n=.0306  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 553.69  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1561.52  
TOTAL AREA(ACRES) = 1141.90 PEAK FLOW RATE(CFS) = 1561.52

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1141.90 TC(MIN.) = 40.19  
AREA-AVERAGED Fm(INCH/HR)= 0.26 Ybar = 0.38  
PEAK FLOW RATE(CFS) = 1561.52

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU39100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1938.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU38100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1561.52 Tc(MIN.) = 40.19  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.38  
TOTAL AREA(ACRES) = 1141.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1938.00 = 16163.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1038.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1561.52 Tc(MIN.) = 40.19  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.38  
TOTAL AREA(ACRES) = 1141.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1038.00 = 16163.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1038.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1039.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2700.00 DOWNSTREAM(FEET) = 2600.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2298.00 CHANNEL SLOPE = 0.0435  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1561.52  
FLOW VELOCITY(FEET/SEC.) = 17.57 FLOW DEPTH(FEET) = 5.67  
TRAVEL TIME(MIN.) = 2.18 Tc(MIN.) = 42.37  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1039.00 = 18461.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1039.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 42.37  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.819  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 3.20 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 10.50 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 88.80 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 102.50  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.04;1H= 1.51;3H= 3.08;6H= 4.81;24H= 8.76  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.71; LAG(HR) = 0.56; Fm(INCH/HR) = 0.25; Ybar = 0.37  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94;

3HR = 0.99; 6HR = 1.00; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1244.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1039.00 = 18461.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0383; Lca/L=0.4,n=.0343; Lca/L=0.5,n=.0315;Lca/L=0.6,n=.0294  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 609.25  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1684.82  
TOTAL AREA(ACRES) = 1244.40 PEAK FLOW RATE(CFS) = 1684.82

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1244.40 TC(MIN.) = 42.37  
AREA-AVERAGED Fm(INCH/HR)= 0.25 Ybar = 0.37  
PEAK FLOW RATE(CFS) = 1684.82

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU40100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1039.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU39100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1684.82 Tc(MIN.) = 42.37  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.37  
TOTAL AREA(ACRES) = 1244.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1039.00 = 18461.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1039.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1684.82 Tc(MIN.) = 42.37  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.37  
TOTAL AREA(ACRES) = 1244.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1039.00 = 18461.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1039.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1040.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2600.00 DOWNSTREAM(FEET) = 2400.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3287.00 CHANNEL SLOPE = 0.0608  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1684.82  
FLOW VELOCITY(FEET/SEC.) = 20.27 FLOW DEPTH(FEET) = 5.40  
TRAVEL TIME(MIN.) = 2.70 Tc(MIN.) = 45.07  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1040.00 = 21748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1040.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 45.07  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.755  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 115.00 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 115.00  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.04;1H= 1.51;3H= 3.08;6H= 4.81;24H= 8.76  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.75; LAG(HR) = 0.60; Fm(INCH/HR) = 0.25; Ybar = 0.36  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94;  
3HR = 0.99; 6HR = 1.00; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1359.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1040.00 = 21748.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:



Lca/L=0.3,n=.0368; Lca/L=0.4,n=.0330; Lca/L=0.5,n=.0303;Lca/L=0.6,n=.0283  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 672.69  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1777.88  
TOTAL AREA(ACRES) = 1359.40 PEAK FLOW RATE(CFS) = 1777.88

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1359.40 TC(MIN.) = 45.07  
AREA-AVERAGED Fm(INCH/HR)= 0.25 Ybar = 0.36  
PEAK FLOW RATE(CFS) = 1777.88

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU41100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--  
  
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

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1040.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU40100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1777.88 Tc(MIN.) = 45.07  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.36  
TOTAL AREA(ACRES) = 1359.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1040.00 = 21748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1040.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1777.88 Tc(MIN.) = 45.07  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.36  
TOTAL AREA(ACRES) = 1359.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1040.00 = 21748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1040.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1041.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2400.00 DOWNSTREAM(FEET) = 2200.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2212.00 CHANNEL SLOPE = 0.0904  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1777.88  
FLOW VELOCITY(FEET/SEC.) = 20.19 FLOW DEPTH(FEET) = 5.63  
TRAVEL TIME(MIN.) = 1.83 Tc(MIN.) = 46.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1041.00 = 23960.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1041.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 46.90  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.716  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 61.20 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 156.90 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 218.10  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.04;1H= 1.51;3H= 3.08;6H= 4.81;24H= 8.76  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.78; LAG(HR) = 0.63; Fm(INCH/HR) = 0.24; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.93; 30M = 0.93; 1HR = 0.93;  
3HR = 0.99; 6HR = 0.99; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1577.50

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1041.00 = 23960.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0364; Lca/L=0.4,n=.0327; Lca/L=0.5,n=.0300;Lca/L=0.6,n=.0280  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 789.69  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1988.74  
TOTAL AREA(ACRES) = 1577.50 PEAK FLOW RATE(CFS) = 1988.74

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1577.50 TC(MIN.) = 46.90  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.35  
PEAK FLOW RATE(CFS) = 1988.74

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU42100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1041.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU41100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1988.74 Tc(MIN.) = 46.90  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.35  
TOTAL AREA(ACRES) = 1577.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1041.00 = 23960.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1041.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1988.74 Tc(MIN.) = 46.90  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.35  
TOTAL AREA(ACRES) = 1577.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1041.00 = 23960.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1041.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1042.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2200.00 DOWNSTREAM(FEET) = 2000.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1708.00 CHANNEL SLOPE = 0.1171  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1988.74  
FLOW VELOCITY(FEET/SEC.) = 22.88 FLOW DEPTH(FEET) = 5.58  
TRAVEL TIME(MIN.) = 1.24 Tc(MIN.) = 48.14  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1042.00 = 25668.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1042.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 48.14  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.690  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 169.60 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 24.80 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 194.40  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.04;1H= 1.51;3H= 3.08;6H= 4.81;24H= 8.76  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.80; LAG(HR) = 0.64; Fm(INCH/HR) = 0.24; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;  
3HR = 0.99; 6HR = 0.99; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1771.90

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1042.00 = 25668.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0362; Lca/L=0.4,n=.0325; Lca/L=0.5,n=.0299;Lca/L=0.6,n=.0279  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 887.86  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2165.96  
TOTAL AREA(ACRES) = 1771.90 PEAK FLOW RATE(CFS) = 2165.96

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.51; 3HR = 3.08; 6HR = 4.81; 24HR = 8.76

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1771.90 TC(MIN.) = 48.14  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.35  
PEAK FLOW RATE(CFS) = 2165.96

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU43100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
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

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 7.600
- 2) 10.000; 4.500
- 3) 15.000; 3.500
- 4) 20.000; 2.750
- 5) 30.000; 2.100
- 6) 60.000; 1.520
- 7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / PARK- SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

- GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
- Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
  - (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.040
MOUNTAIN	0.890
VALLEY(UNDEVELOPED)/DESERT	0.060
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1042.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU42100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2165.96 Tc(MIN.) = 48.14  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.35  
TOTAL AREA(ACRES) = 1771.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1042.00 = 25668.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1042.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2165.96 Tc(MIN.) = 48.14  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.35  
TOTAL AREA(ACRES) = 1771.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1042.00 = 25668.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1042.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1043.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2000.00 DOWNSTREAM(FEET) = 1990.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1322.00 CHANNEL SLOPE = 0.0076  
CHANNEL BASE(FEET) = 20.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 2165.96  
FLOW VELOCITY(FEET/SEC.) = 9.74 FLOW DEPTH(FEET) = 7.95  
TRAVEL TIME(MIN.) = 2.26 Tc(MIN.) = 50.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1043.00 = 26990.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1043.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 50.40  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.646  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	A	7.40	0.40	1.00	40
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	42.50	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	106.00	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 155.90  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.04;1H= 1.51;3H= 3.08;6H= 4.80;24H= 8.75  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.84; LAG(HR) = 0.67; Fm(INCH/HR) = 0.24; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.91; 30M = 0.91; 1HR = 0.91;

3HR = 0.99; 6HR = 0.99; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1927.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1043.00 = 26990.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0362; Lca/L=0.4,n=.0325; Lca/L=0.5,n=.0298;Lca/L=0.6,n=.0278  
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 967.26  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2278.33  
TOTAL AREA(ACRES) = 1927.80 PEAK FLOW RATE(CFS) = 2278.33

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.62; 30M = 1.03; 1HR = 1.50; 3HR = 3.04; 6HR = 4.74; 24HR = 8.61

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1927.80 TC(MIN.) = 50.40  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.35  
PEAK FLOW RATE(CFS) = 2278.33

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU44100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1043.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU43100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2278.33 Tc(MIN.) = 50.40  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.35  
TOTAL AREA(ACRES) = 1927.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1043.00 = 26990.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1043.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2278.33 Tc(MIN.) = 50.40  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.35  
TOTAL AREA(ACRES) = 1927.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1043.00 = 26990.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1043.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1044.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1990.00 DOWNSTREAM(FEET) = 1980.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1681.00 CHANNEL SLOPE = 0.0059  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 2278.33  
FLOW VELOCITY(FEET/SEC.) = 8.87 FLOW DEPTH(FEET) = 7.82  
TRAVEL TIME(MIN.) = 3.16 Tc(MIN.) = 53.56  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1044.00 = 28671.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1044.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 53.56  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.590  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 2.20 0.40 1.00 40  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 27.60 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 59.80 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 89.60  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.04;1H= 1.51;3H= 3.07;6H= 4.80;24H= 8.73  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.89; LAG(HR) = 0.71; Fm(INCH/HR) = 0.24; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.91; 30M = 0.91; 1HR = 0.91;



3HR = 0.99; 6HR = 0.99; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2017.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1044.00 = 28671.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0364; Lca/L=0.4,n=.0326; Lca/L=0.5,n=.0300;Lca/L=0.6,n=.0280  
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 1011.72  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2355.23  
TOTAL AREA(ACRES) = 2017.40 PEAK FLOW RATE(CFS) = 2355.23

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.61; 30M = 1.02; 1HR = 1.48; 3HR = 2.98; 6HR = 4.62; 24HR = 8.37

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 2017.40 TC(MIN.) = 53.56  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.35  
PEAK FLOW RATE(CFS) = 2355.23

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU45100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1044.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU44100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2355.23 Tc(MIN.) = 53.56  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.35  
TOTAL AREA(ACRES) = 2017.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1044.00 = 28671.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1044.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2355.23 Tc(MIN.) = 53.56  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.35  
TOTAL AREA(ACRES) = 2017.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1044.00 = 28671.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1044.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1045.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1980.00 DOWNSTREAM(FEET) = 1960.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2360.00 CHANNEL SLOPE = 0.0085  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 2355.23  
FLOW VELOCITY(FEET/SEC.) = 10.15 FLOW DEPTH(FEET) = 7.21  
TRAVEL TIME(MIN.) = 3.88 Tc(MIN.) = 57.44  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1045.00 = 31031.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1045.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 57.44  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.528  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 40.90 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 179.40 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 97.70 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 318.00

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.62;30M= 1.04;1H= 1.50;3H= 3.05;6H= 4.76;24H= 8.65  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.96; LAG(HR) = 0.77; Fm(INCH/HR) = 0.24; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;

3HR = 0.98; 6HR = 0.99; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2335.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1045.00 = 31031.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0363; Lca/L=0.4,n=.0326; Lca/L=0.5,n=.0299;Lca/L=0.6,n=.0279  
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 1155.75  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2557.50  
TOTAL AREA(ACRES) = 2335.40 PEAK FLOW RATE(CFS) = 2557.50

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.60; 30M = 1.02; 1HR = 1.46; 3HR = 2.91; 6HR = 4.50; 24HR = 8.13

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 2335.40 TC(MIN.) = 57.44  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.35  
PEAK FLOW RATE(CFS) = 2557.50

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU46100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1045.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU45100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2557.50 Tc(MIN.) = 57.44  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.35  
TOTAL AREA(ACRES) = 2335.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1045.00 = 31031.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1045.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2557.50 Tc(MIN.) = 57.44  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.35  
TOTAL AREA(ACRES) = 2335.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1045.00 = 31031.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1045.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1046.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1960.00 DOWNSTREAM(FEET) = 1915.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2743.00 CHANNEL SLOPE = 0.0164  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 2557.50  
FLOW VELOCITY(FEET/SEC.) = 13.11 FLOW DEPTH(FEET) = 6.24  
TRAVEL TIME(MIN.) = 3.49 Tc(MIN.) = 60.92  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1046.00 = 33774.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1046.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 60.92  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.477  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 30.70 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 79.90 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 110.60  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.62;30M= 1.03;1H= 1.49;3H= 3.03;6H= 4.71;24H= 8.56  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.02; LAG(HR) = 0.81; Fm(INCH/HR) = 0.24; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.89; 30M = 0.89; 1HR = 0.89;  
3HR = 0.98; 6HR = 0.99; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2446.00

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1046.00 = 33774.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0358; Lca/L=0.4,n=.0321; Lca/L=0.5,n=.0295;Lca/L=0.6,n=.0275  
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 1191.13  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2534.28  
TOTAL AREA(ACRES) = 2446.00 PEAK FLOW RATE(CFS) = 2557.50  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 0.96; 1HR = 1.34; 3HR = 2.55; 6HR = 3.83; 24HR = 6.77

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 2446.00 TC(MIN.) = 60.92  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.35  
PEAK FLOW RATE(CFS) = 2557.50

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU47100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1046.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOW RATE(CFS)	Tc(MIN.)
2557.50	60.92

AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.35  
TOTAL AREA(ACRES) = 2446.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1046.00 = 33774.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1046.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2557.50 Tc(MIN.) = 60.92  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.35  
TOTAL AREA(ACRES) = 2446.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1046.00 = 33774.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1046.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1047.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1915.00 DOWNSTREAM(FEET) = 1910.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 221.00 CHANNEL SLOPE = 0.0226  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 2557.50  
FLOW VELOCITY(FEET/SEC.) = 14.66 FLOW DEPTH(FEET) = 5.69  
TRAVEL TIME(MIN.) = 0.25 Tc(MIN.) = 61.18  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1047.00 = 33995.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1047.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 61.18  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.473  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	146.30	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	1591.10	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	118.40	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1855.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.62;30M= 1.04;1H= 1.50;3H= 3.04;6H= 4.73;24H= 8.61  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.02; LAG(HR) = 0.82; Fm(INCH/HR) = 0.25; Ybar = 0.36  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.81; 30M = 0.81; 1HR = 0.81;

3HR = 0.97; 6HR = 0.99; 24HR= 0.99  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4301.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1047.00 = 33995.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0358; Lca/L=0.4,n=.0320; Lca/L=0.5,n=.0294;Lca/L=0.6,n=.0275  
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 2086.43  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 4126.08  
TOTAL AREA(ACRES) = 4301.80 PEAK FLOW RATE(CFS) = 4126.08

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.63; 30M = 1.04; 1HR = 1.50; 3HR = 3.06; 6HR = 4.76; 24HR = 8.67

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 4301.80 TC(MIN.) = 61.18  
AREA-AVERAGED Fm(INCH/HR)= 0.25 Ybar = 0.36  
PEAK FLOW RATE(CFS) = 4126.08

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU48100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
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

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / PARK- SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.070  
MOUNTAIN 0.860  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1047.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU47100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 4126.08 Tc(MIN.) = 61.18  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.36  
TOTAL AREA(ACRES) = 4301.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1047.00 = 33995.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1047.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 4126.08 Tc(MIN.) = 61.18  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.36  
TOTAL AREA(ACRES) = 4301.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1047.00 = 33995.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1047.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1048.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1910.00 DOWNSTREAM(FEET) = 1750.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1601.00 CHANNEL SLOPE = 0.0999  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 4126.08  
FLOW VELOCITY(FEET/SEC.) = 24.33 FLOW DEPTH(FEET) = 5.55  
TRAVEL TIME(MIN.) = 1.10 Tc(MIN.) = 62.27  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1048.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 62.27  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.458  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	A	3.60	0.40	1.00	40
NATURAL FAIR COVER "WOODLAND"	A	3.30	0.40	1.00	36
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	59.50	0.30	1.00	63
NATURAL POOR COVER "BARREN"	B	0.40	0.30	1.00	86
NATURAL FAIR COVER "GRASS"	B	0.10	0.30	1.00	69
NATURAL FAIR COVER "WOODLAND"	B	16.70	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 83.60  
UNIT-HYDROGRAPH DATA:



RAINFALL(INCH): 5M= 0.62;30M= 1.04;1H= 1.50;3H= 3.04;6H= 4.73;24H= 8.61  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
 MOUNTAIN= 88.9%;FOOTHILL= 4.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.04; LAG(HR) = 0.83; Fm(INCH/HR) = 0.25; Ybar = 0.36  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.80; 30M = 0.80; 1HR = 0.80;  
 3HR = 0.97; 6HR = 0.99; 24HR= 0.99  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4385.40  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0356; Lca/L=0.4,n=.0319; Lca/L=0.5,n=.0293;Lca/L=0.6,n=.0274  
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 2117.80  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 4189.70  
 TOTAL AREA(ACRES) = 4385.40 PEAK FLOW RATE(CFS) = 4189.70

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.63; 30M = 1.04; 1HR = 1.50; 3HR = 3.06; 6HR = 4.78; 24HR = 8.69

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1047.00 TO NODE 1048.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 62.27

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.508  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

NATURAL FAIR COVER						
"CHAPARRAL,BROADLEAF"	C	926.70	0.25	1.00	75	
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	0.50	0.25	0.50	69	
NATURAL POOR COVER						
"BARREN"	C	10.50	0.25	1.00	91	
NATURAL FAIR COVER						
"GRASS"	C	10.70	0.25	1.00	79	
NATURAL FAIR COVER						
"CHAPARRAL,NARROWLEAF"	C	299.20	0.25	1.00	81	
NATURAL FAIR COVER						
"WOODLAND"	C	40.40	0.25	1.00	73	

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1288.00

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.63;30M= 1.04;1H= 1.50;3H= 3.05;6H= 4.74;24H= 8.63  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
 MOUNTAIN= 88.3%;FOOTHILL= 4.7%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.04; LAG(HR) = 0.83; Fm(INCH/HR) = 0.25; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.77; 30M = 0.77; 1HR = 0.77;  
 3HR = 0.96; 6HR = 0.98; 24HR= 0.99  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 5673.40  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0356; Lca/L=0.4,n=.0319; Lca/L=0.5,n=.0293;Lca/L=0.6,n=.0274  
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 2753.77  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5238.23  
 TOTAL AREA(ACRES) = 5673.40 PEAK FLOW RATE(CFS) = 5238.23

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.63; 30M = 1.04; 1HR = 1.50; 3HR = 3.06; 6HR = 4.78; 24HR = 8.69

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1047.00 TO NODE 1048.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 62.27

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.508  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

NATURAL FAIR COVER						
"CHAPARRAL,BROADLEAF"	D	805.90	0.20	1.00	81	
NATURAL FAIR COVER						
"WOODLAND"	D	51.50	0.20	1.00	79	
NATURAL POOR COVER						
"BARREN"	D	2.40	0.20	1.00	93	
NATURAL FAIR COVER						
"GRASS"	D	3.10	0.20	1.00	84	
NATURAL FAIR COVER						
"OPEN BRUSH"	D	23.30	0.20	1.00	83	
NATURAL FAIR COVER						
"CHAPARRAL,NARROWLEAF"	D	567.30	0.20	1.00	86	

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1453.50  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.63;30M= 1.04;1H= 1.50;3H= 3.05;6H= 4.75;24H= 8.64  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
 MOUNTAIN= 87.8%;FOOTHILL= 5.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.04; LAG(HR) = 0.83; Fm(INCH/HR) = 0.24; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.73; 30M = 0.73; 1HR = 0.73;  
 3HR = 0.96; 6HR = 0.98; 24HR= 0.99  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 7126.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0356; Lca/L=0.4,n=.0319; Lca/L=0.5,n=.0293;Lca/L=0.6,n=.0274  
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 3546.72  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 6407.52  
 TOTAL AREA(ACRES) = 7126.90 PEAK FLOW RATE(CFS) = 6407.52

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.63; 30M = 1.04; 1HR = 1.50; 3HR = 3.06; 6HR = 4.78; 24HR = 8.69

\*\*\*\*\*  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 7126.90 TC(MIN.) = 62.27  
 AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.33  
 PEAK FLOW RATE(CFS) = 6407.52

\*\*\*\*\*  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

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FILE NAME: LU49100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.050  
MOUNTAIN 0.800  
VALLEY(UNDEVELOPED)/DESERT 0.140  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1048.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU48100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 6407.52 Tc(MIN.) = 62.22  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.33  
TOTAL AREA(ACRES) = 7126.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1048.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 6407.52 Tc(MIN.) = 62.22  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.33  
TOTAL AREA(ACRES) = 7126.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1048.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1049.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1750.00 DOWNSTREAM(FEET) = 1670.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2254.00 CHANNEL SLOPE = 0.0355  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 6407.52  
FLOW VELOCITY(FEET/SEC.) = 19.25 FLOW DEPTH(FEET) = 9.62  
TRAVEL TIME(MIN.) = 1.95 Tc(MIN.) = 64.22  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1049.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 64.22  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.433  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 10.20 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" B 2.00 0.30 1.00 72  
NATURAL FAIR COVER  
"WOODLAND" B 11.10 0.30 1.00 60  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 267.80 0.25 1.00 75  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" C 3.40 0.25 0.50 69  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 128.10 0.25 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 422.60  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.62;30M= 1.04;1H= 1.49;3H= 3.04;6H= 4.73;24H= 8.60  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.4%  
MOUNTAIN= 87.4%;FOOTHILL= 5.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.07; LAG(HR) = 0.86; Fm(INCH/HR) = 0.24; Ybar = 0.33  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.72; 30M = 0.72; 1HR = 0.72;  
3HR = 0.95; 6HR = 0.98; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 7549.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0350; Lca/L=0.4,n=.0314; Lca/L=0.5,n=.0288;Lca/L=0.6,n=.0269  
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 3727.40  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 6649.30  
TOTAL AREA(ACRES) = 7549.50 PEAK FLOW RATE(CFS) = 6649.30

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.58; 30M = 1.01; 1HR = 1.44; 3HR = 2.86; 6HR = 4.40; 24HR = 7.92

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1049.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 64.22  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.497  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "WOODLAND"	C	4.70	0.25	1.00	73
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	391.50	0.20	1.00	81
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	149.60	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	33.60	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 579.40

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.62;30M= 1.03;1H= 1.49;3H= 3.03;6H= 4.71;24H= 8.55  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.8%;FOOTHILL= 5.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.07; LAG(HR) = 0.86; Fm(INCH/HR) = 0.24; Ybar = 0.33  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.70; 30M = 0.70; 1HR = 0.70;  
3HR = 0.95; 6HR = 0.97; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 8128.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0350; Lca/L=0.4,n=.0314; Lca/L=0.5,n=.0288;Lca/L=0.6,n=.0269  
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 4004.39  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7035.20  
TOTAL AREA(ACRES) = 8128.90 PEAK FLOW RATE(CFS) = 7035.20

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.58; 30M = 1.01; 1HR = 1.44; 3HR = 2.86; 6HR = 4.40; 24HR = 7.92

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 8128.90 TC(MIN.) = 64.22  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.33  
PEAK FLOW RATE(CFS) = 7035.20

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU50100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.050  
MOUNTAIN 0.870  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1049.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU49100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 7035.20 Tc(MIN.) = 64.22  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.33  
TOTAL AREA(ACRES) = 8128.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1049.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 7035.20 Tc(MIN.) = 64.22  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.33  
TOTAL AREA(ACRES) = 8128.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1049.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1050.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1670.00 DOWNSTREAM(FEET) = 1665.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 290.00 CHANNEL SLOPE = 0.0172  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 7035.20  
FLOW VELOCITY(FEET/SEC.) = 15.23 FLOW DEPTH(FEET) = 12.36  
TRAVEL TIME(MIN.) = 0.32 Tc(MIN.) = 64.54  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1050.00 = 38140.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1050.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 64.54  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.429  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 41.60 0.40 1.00 40  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 85.70 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1084.00 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 175.60 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1386.90  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.62;30M= 1.03;1H= 1.49;3H= 3.01;6H= 4.69;24H= 8.51  
S-GRAPH: VALLEY(DEV.) = 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.9%;FOOTHILL= 5.1%;DESERT(UNDEV.) = 0.0%  
Tc(HR) = 1.08; LAG(HR) = 0.86; Fm(INCH/HR) = 0.24; Ybar = 0.34

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.68; 30M = 0.68; 1HR = 0.69;  
3HR = 0.94; 6HR = 0.97; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 9515.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1050.00 = 38140.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0349; Lca/L=0.4,n=.0313; Lca/L=0.5,n=.0288;Lca/L=0.6,n=.0269  
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 4611.48  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7967.78  
TOTAL AREA(ACRES) = 9515.80 PEAK FLOW RATE(CFS) = 7967.78

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.60; 30M = 1.02; 1HR = 1.47; 3HR = 2.95; 6HR = 4.57; 24HR = 8.27

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 9515.80 TC(MIN.) = 64.54  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.34  
PEAK FLOW RATE(CFS) = 7967.78

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU51100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.050  
MOUNTAIN 0.870  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1050.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME:	LU50100E.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:	
PEAK FLOW RATE(CFS) =	7967.78 Tc(MIN.) = 64.54
AREA-AVERAGED Fm(INCH/HR) =	0.24 Ybar = 0.34
TOTAL AREA(ACRES) =	9515.80
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE 1050.00 = 38140.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1050.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 7967.78 Tc(MIN.) = 64.54  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.34  
TOTAL AREA(ACRES) = 9515.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1050.00 = 38140.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1050.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1051.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1665.00 DOWNSTREAM(FEET) = 1630.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2134.00 CHANNEL SLOPE = 0.0164  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 7967.78  
FLOW VELOCITY(FEET/SEC.) = 15.28 FLOW DEPTH(FEET) = 12.32  
TRAVEL TIME(MIN.) = 2.33 Tc(MIN.) = 66.87  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1051.00 = 40274.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1051.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 66.87  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.400  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	297.00	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	163.30	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 460.30  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.62;30M= 1.03;1H= 1.49;3H= 3.01;6H= 4.67;24H= 8.48  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.9%;FOOTHILL= 5.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.11; LAG(HR) = 0.89; Fm(INCH/HR) = 0.24; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;  
3HR = 0.94; 6HR = 0.97; 24HR = 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 9976.10

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1051.00 = 40274.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0345; Lca/L=0.4,n=.0309; Lca/L=0.5,n=.0284;Lca/L=0.6,n=.0265  
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 4801.99  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8128.89  
TOTAL AREA(ACRES) = 9976.10 PEAK FLOW RATE(CFS) = 8128.89

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.58; 30M = 1.00; 1HR = 1.43; 3HR = 2.82; 6HR = 4.34; 24HR = 7.80

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 9976.10 TC(MIN.) = 66.87  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.34  
PEAK FLOW RATE(CFS) = 8128.89

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU52100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.050  
MOUNTAIN 0.870  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1051.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU51100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 8128.89 Tc(MIN.) = 66.87  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.34  
TOTAL AREA(ACRES) = 9976.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1051.00 = 40274.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1051.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 8128.89 Tc(MIN.) = 66.87  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.34  
TOTAL AREA(ACRES) = 9976.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1051.00 = 40274.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1051.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1052.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1630.00 DOWNSTREAM(FEET) = 1410.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5523.00 CHANNEL SLOPE = 0.0398  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 8128.89  
FLOW VELOCITY(FEET/SEC.) = 21.10 FLOW DEPTH(FEET) = 9.70  
TRAVEL TIME(MIN.) = 4.36 Tc(MIN.) = 71.23  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1052.00 = 45797.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1052.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 71.23  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.350  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 19.10 0.40 1.00 40  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 198.40 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 507.40 0.20 1.00 81  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" D 26.70 0.20 1.00 86  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 751.60

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.61;30M= 1.03;1H= 1.48;3H= 2.97;6H= 4.61;24H= 8.36  
S-GRAPH: VALLEY(DEV.) = 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.9%;FOOTHILL= 5.1%;DESERT(UNDEV.) = 0.0%  
Tc(HR) = 1.19; LAG(HR) = 0.95; Fm(INCH/HR) = 0.24; Ybar = 0.34



USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.67; 1HR = 0.67;  
3HR = 0.94; 6HR = 0.97; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10727.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1052.00 = 45797.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0299; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0256  
TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 5061.90  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8214.01  
TOTAL AREA(ACRES) = 10727.70 PEAK FLOW RATE(CFS) = 8214.01

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.53; 30M = 0.96; 1HR = 1.35; 3HR = 2.56; 6HR = 3.85; 24HR = 6.82

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 10727.70 TC(MIN.) = 71.23  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.34  
PEAK FLOW RATE(CFS) = 8214.01

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU53100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.110  
MOUNTAIN 0.810  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1052.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU52100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 8214.01 Tc(MIN.) = 71.23  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.34  
TOTAL AREA(ACRES) = 10727.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1052.00 = 45797.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1052.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 8214.01 Tc(MIN.) = 71.23  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.34  
TOTAL AREA(ACRES) = 10727.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1052.00 = 45797.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1052.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1053.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1410.00 DOWNSTREAM(FEET) = 1297.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2262.00 CHANNEL SLOPE = 0.0500  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 8214.01  
FLOW VELOCITY(FEET/SEC.) = 22.93 FLOW DEPTH(FEET) = 9.15  
TRAVEL TIME(MIN.) = 1.64 Tc(MIN.) = 72.88  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1053.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 72.88  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.333  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 4.50 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" B 2.20 0.30 1.00 72  
NATURAL FAIR COVER  
"WOODLAND" B 31.40 0.30 1.00 60  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 214.70 0.25 1.00 75  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" C 21.40 0.25 0.50 69  
NATURAL POOR COVER  
"BARREN" C 0.70 0.25 1.00 91  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.96  
SUBAREA AREA(ACRES) = 274.90  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.61;30M= 1.03;1H= 1.48;3H= 2.97;6H= 4.61;24H= 8.36  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.7%;FOOTHILL= 5.3%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.21; LAG(HR) = 0.97; Fm(INCH/HR) = 0.24; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.65; 30M = 0.66; 1HR = 0.67;  
3HR = 0.94; 6HR = 0.97; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 11002.60  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0330; Lca/L=0.4,n=.0296; Lca/L=0.5,n=.0272;Lca/L=0.6,n=.0253  
TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 5174.84  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8405.65  
TOTAL AREA(ACRES) = 11002.60 PEAK FLOW RATE(CFS) = 8405.65

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.60; 30M = 1.02; 1HR = 1.47; 3HR = 2.94; 6HR = 4.56; 24HR = 8.25

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1053.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 72.88  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.451  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	C	7.60	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	35.40	0.25	1.00	77
PUBLIC PARK	C	0.20	0.25	0.85	69
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	85.00	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	92.50	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	717.00	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 937.70

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.61;30M= 1.02;1H= 1.48;3H= 2.97;6H= 4.61;24H= 8.35  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.3%;FOOTHILL= 5.7%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.21; LAG(HR) = 0.97; Fm(INCH/HR) = 0.23; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.64; 30M = 0.65; 1HR = 0.66;  
3HR = 0.93; 6HR = 0.97; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 11940.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0330; Lca/L=0.4,n=.0296; Lca/L=0.5,n=.0272;Lca/L=0.6,n=.0253  
TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 5624.04  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8997.42  
TOTAL AREA(ACRES) = 11940.30 PEAK FLOW RATE(CFS) = 8997.42

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.60; 30M = 1.02; 1HR = 1.47; 3HR = 2.94; 6HR = 4.56; 24HR = 8.25

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1053.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 72.88  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.451

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	2.90	0.20	0.50	75
NATURAL FAIR COVER					
"GRASS"	D	10.20	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	44.50	0.20	1.00	83
PUBLIC PARK	D	0.70	0.20	0.85	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	674.40	0.20	1.00	86
NATURAL FAIR COVER					
"WOODLAND"	D	148.30	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 881.00

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.61;30M= 1.02;1H= 1.47;3H= 2.97;6H= 4.61;24H= 8.34  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.21; LAG(HR) = 0.97; Fm(INCH/HR) = 0.23; Ybar = 0.33  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.62; 30M = 0.64; 1HR = 0.64;  
3HR = 0.93; 6HR = 0.96; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 12821.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0330; Lca/L=0.4,n=.0296; Lca/L=0.5,n=.0272;Lca/L=0.6,n=.0253  
TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 6075.00  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9556.33  
TOTAL AREA(ACRES) = 12821.30 PEAK FLOW RATE(CFS) = 9556.33

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.60; 30M = 1.02; 1HR = 1.47; 3HR = 2.94; 6HR = 4.56; 24HR = 8.25

=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 12821.30 TC(MIN.) = 72.88  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.33  
PEAK FLOW RATE(CFS) = 9556.33

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU54100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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

\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 7.600
- 2) 10.000; 4.500
- 3) 15.000; 3.500
- 4) 20.000; 2.750
- 5) 30.000; 2.100
- 6) 60.000; 1.520
- 7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.060
MOUNTAIN	0.860
VALLEY(UNDEVELOPED)/DESERT	0.070
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1053.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU53100E.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9556.33 Tc(MIN.) = 72.88

AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33

TOTAL AREA(ACRES) = 12821.30

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1053.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9556.33 Tc(MIN.) = 72.88

AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33

TOTAL AREA(ACRES) = 12821.30

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1053.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1054.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1297.00 DOWNSTREAM(FEET) = 1235.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3488.00 CHANNEL SLOPE = 0.0178  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9556.33  
FLOW VELOCITY(FEET/SEC.) = 19.43 FLOW DEPTH(FEET) = 11.78  
TRAVEL TIME(MIN.) = 2.99 Tc(MIN.) = 75.87  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1054.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 75.87  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.302

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	435.00	0.25	1.00	75
NATURAL FAIR COVER "OPEN BRUSH"	C	7.80	0.25	1.00	77
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	C	36.00	0.25	1.00	81
NATURAL FAIR COVER "WOODLAND"	C	10.20	0.25	1.00	73
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	271.30	0.20	1.00	81
NATURAL FAIR COVER "OPEN BRUSH"	D	26.90	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 787.20

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.60;30M= 1.02;1H= 1.47;3H= 2.95;6H= 4.57;24H= 8.27  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.26; LAG(HR) = 1.01; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.61; 30M = 0.63; 1HR = 0.63;  
 3HR = 0.92; 6HR = 0.96; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 13608.50  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0323; Lca/L=0.4,n=.0290; Lca/L=0.5,n=.0266;Lca/L=0.6,n=.0248  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 6386.77  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9357.70  
 TOTAL AREA(ACRES) = 13608.50 PEAK FLOW RATE(CFS) = 9556.33  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.53; 30M = 0.97; 1HR = 1.36; 3HR = 2.61; 6HR = 3.94; 24HR = 6.99

\*\*\*\*\*

FLOW PROCESS FROM NODE 1053.00 TO NODE 1054.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 75.87  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.435  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	5.30	0.20	1.00	86
NATURAL FAIR COVER					
"WOODLAND"	D	13.70	0.20	1.00	79

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 19.00

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.60;30M= 1.02;1H= 1.47;3H= 2.95;6H= 4.57;24H= 8.26  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.26; LAG(HR) = 1.01; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.61; 30M = 0.63; 1HR = 0.63;  
 3HR = 0.92; 6HR = 0.96; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 13627.50  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0323; Lca/L=0.4,n=.0290; Lca/L=0.5,n=.0266;Lca/L=0.6,n=.0248  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 6394.21  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9366.96  
 TOTAL AREA(ACRES) = 13627.50 PEAK FLOW RATE(CFS) = 9556.33  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.53; 30M = 0.97; 1HR = 1.36; 3HR = 2.61; 6HR = 3.94; 24HR = 6.99

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 13627.50 TC(MIN.) = 75.87  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.33  
 PEAK FLOW RATE(CFS) = 9556.33

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU55100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.060  
MOUNTAIN 0.860  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1054.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU54100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9556.33 Tc(MIN.) = 75.87  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 13627.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1054.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9556.33 Tc(MIN.) = 75.87  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 13627.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1054.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1055.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1235.00 DOWNSTREAM(FEET) = 1115.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3993.00 CHANNEL SLOPE = 0.0301  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9556.33  
FLOW VELOCITY(FEET/SEC.) = 23.44 FLOW DEPTH(FEET) = 10.15  
TRAVEL TIME(MIN.) = 2.84 Tc(MIN.) = 78.71  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1055.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 78.71  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.275  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	43.80	0.25	1.00	75
NATURAL FAIR COVER "OPEN BRUSH"	C	21.40	0.25	1.00	77
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	C	35.80	0.25	1.00	81
NATURAL FAIR COVER "WOODLAND"	C	11.10	0.25	1.00	73
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	659.60	0.20	1.00	81
NATURAL FAIR COVER "OPEN BRUSH"	D	129.70	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 901.40  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.60;30M= 1.02;1H= 1.46;3H= 2.92;6H= 4.51;24H= 8.15  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.31; LAG(HR) = 1.05; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.59; 30M = 0.62; 1HR = 0.62;  
 3HR = 0.92; 6HR = 0.96; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 14528.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0316; Lca/L=0.4,n=.0283; Lca/L=0.5,n=.0260;Lca/L=0.6,n=.0243  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 6707.83  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9727.61  
 TOTAL AREA(ACRES) = 14528.90 PEAK FLOW RATE(CFS) = 9727.61

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.51; 30M = 0.95; 1HR = 1.31; 3HR = 2.46; 6HR = 3.67; 24HR = 6.45

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1054.00 TO NODE 1055.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====  
 MAINLINE Tc(MIN) = 78.71  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.420  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	86.60	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	43.40	0.20	1.00	79

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 130.00

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.60;30M= 1.02;1H= 1.46;3H= 2.91;6H= 4.50;24H= 8.14  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.31; LAG(HR) = 1.05; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.59; 30M = 0.61; 1HR = 0.62;  
 3HR = 0.92; 6HR = 0.96; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 14658.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0316; Lca/L=0.4,n=.0283; Lca/L=0.5,n=.0260;Lca/L=0.6,n=.0243  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 6755.68  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9784.74  
 TOTAL AREA(ACRES) = 14658.90 PEAK FLOW RATE(CFS) = 9784.74

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.51; 30M = 0.95; 1HR = 1.31; 3HR = 2.46; 6HR = 3.67; 24HR = 6.45

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 14658.90 TC(MIN.) = 78.71  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.33  
 PEAK FLOW RATE(CFS) = 9784.74

=====  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU56100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.060  
MOUNTAIN 0.860  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1055.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU55100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9784.74 Tc(MIN.) = 78.71  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 14658.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1055.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9784.74 Tc(MIN.) = 78.71  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 14658.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1055.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1056.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1115.00 DOWNSTREAM(FEET) = 978.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 4363.00 CHANNEL SLOPE = 0.0314  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9784.74  
FLOW VELOCITY(FEET/SEC.) = 23.97 FLOW DEPTH(FEET) = 10.17  
TRAVEL TIME(MIN.) = 3.03 Tc(MIN.) = 81.74  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1056.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 81.74  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.248  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	11.50	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	B	2.90	0.30	1.00	72
NATURAL FAIR COVER "WOODLAND"	B	15.10	0.30	1.00	60
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	566.60	0.25	1.00	75
NATURAL FAIR COVER "OPEN BRUSH"	C	9.10	0.25	1.00	77
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	C	601.90	0.25	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1207.10  
UNIT-HYDROGRAPH DATA:



RAINFALL(INCH): 5M= 0.59;30M= 1.01;1H= 1.45;3H= 2.89;6H= 4.46;24H= 8.05  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.36; LAG(HR) = 1.09; Fm(INCH/HR) = 0.23; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.57; 30M = 0.60; 1HR = 0.61;  
3HR = 0.91; 6HR = 0.96; 24HR= 0.97  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 15866.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0309; Lca/L=0.4,n=.0277; Lca/L=0.5,n=.0255;Lca/L=0.6,n=.0237  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 7186.58  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 10241.00  
TOTAL AREA(ACRES) = 15866.00 PEAK FLOW RATE(CFS) = 10241.00

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.54; 30M = 0.97; 1HR = 1.36; 3HR = 2.61; 6HR = 3.94; 24HR = 7.00

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1056.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "WOODLAND"	C	84.60	0.25	1.00	73
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	433.40	0.20	1.00	81
NATURAL FAIR COVER "OPEN BRUSH"	D	116.90	0.20	1.00	83
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	298.40	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	94.40	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1027.70  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.59;30M= 1.01;1H= 1.44;3H= 2.87;6H= 4.43;24H= 7.99  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.36; LAG(HR) = 1.09; Fm(INCH/HR) = 0.23; Ybar = 0.33  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.56; 30M = 0.59; 1HR = 0.60;  
3HR = 0.91; 6HR = 0.96; 24HR= 0.97  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 16893.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0309; Lca/L=0.4,n=.0277; Lca/L=0.5,n=.0255;Lca/L=0.6,n=.0237  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 7589.05  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 10720.72  
TOTAL AREA(ACRES) = 16893.70 PEAK FLOW RATE(CFS) = 10720.72

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.54; 30M = 0.97; 1HR = 1.36; 3HR = 2.61; 6HR = 3.94; 24HR = 7.00

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 16893.70 TC(MIN.) = 81.74  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.33  
PEAK FLOW RATE(CFS) = 10720.72

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU57100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.060  
MOUNTAIN 0.860  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1056.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU56100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 10720.72 Tc(MIN.) = 81.74  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 16893.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1056.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 10720.72 Tc(MIN.) = 81.74  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 16893.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1056.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1057.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 978.00 DOWNSTREAM(FEET) = 800.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5201.00 CHANNEL SLOPE = 0.0342  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 10720.72  
FLOW VELOCITY(FEET/SEC.) = 21.63 FLOW DEPTH(FEET) = 11.84  
TRAVEL TIME(MIN.) = 4.01 Tc(MIN.) = 85.75  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1057.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 85.75  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.214  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	2.00	0.25	1.00	75
NATURAL FAIR COVER "MEADOWS"	C	0.90	0.25	1.00	80
NATURAL FAIR COVER "OPEN BRUSH"	C	40.20	0.25	1.00	77
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	C	0.30	0.25	1.00	81
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	208.80	0.20	1.00	81
NATURAL FAIR COVER "OPEN BRUSH"	D	155.20	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 407.40  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.59;30M= 1.01;1H= 1.44;3H= 2.85;6H= 4.39;24H= 7.91  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.43; LAG(HR) = 1.14; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.56; 30M = 0.58; 1HR = 0.59;  
 3HR = 0.90; 6HR = 0.96; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 17301.10  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0304; Lca/L=0.4,n=.0272; Lca/L=0.5,n=.0250;Lca/L=0.6,n=.0234  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 7681.00  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 10726.26  
 TOTAL AREA(ACRES) = 17301.10 PEAK FLOW RATE(CFS) = 10726.26

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.42; 30M = 0.88; 1HR = 1.18; 3HR = 2.03; 6HR = 2.88; 24HR = 4.84

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1056.00 TO NODE 1057.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====  
 MAINLINE Tc(MIN) = 85.75  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.383  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	63.60	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	57.80	0.20	1.00	79

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 121.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.58;30M= 1.01;1H= 1.44;3H= 2.85;6H= 4.38;24H= 7.89  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.43; LAG(HR) = 1.14; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.56; 30M = 0.58; 1HR = 0.59;  
 3HR = 0.90; 6HR = 0.96; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 17422.50  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0304; Lca/L=0.4,n=.0272; Lca/L=0.5,n=.0250;Lca/L=0.6,n=.0234  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 7709.60  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 10764.18  
 TOTAL AREA(ACRES) = 17422.50 PEAK FLOW RATE(CFS) = 10764.18

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.42; 30M = 0.88; 1HR = 1.18; 3HR = 2.03; 6HR = 2.88; 24HR = 4.84

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 17422.50 TC(MIN.) = 85.75  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.34  
 PEAK FLOW RATE(CFS) = 10764.18

=====  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU58100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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

\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 7.600
- 2) 10.000; 4.500
- 3) 15.000; 3.500
- 4) 20.000; 2.750
- 5) 30.000; 2.100
- 6) 60.000; 1.520
- 7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	HALF- WIDTH (FT)	CROWN TO CROSSFALL (FT)	STREET-CROSSFALL IN- / OUT- / PARK- SIDE / SIDE / WAY	CURB HEIGHT (FT)	GUTTER-GEOMETRIES WIDTH (FT)	HIKE LIP (FT)	MANNING FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.100
MOUNTAIN	0.780
VALLEY(UNDEVELOPED)/DESERT	0.110
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1057.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU57100E.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 10764.18 Tc(MIN.) = 85.75

AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.34

TOTAL AREA(ACRES) = 17422.50

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1057.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 10764.18 Tc(MIN.) = 85.75

AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.34

TOTAL AREA(ACRES) = 17422.50

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1057.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 800.00 DOWNSTREAM(FEET) = 657.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 5445.00 CHANNEL SLOPE = 0.0263

CHANNEL BASE(FEET) = 35.00 "Z" FACTOR = 1.000

MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00

CHANNEL FLOW THRU SUBAREA(CFS) = 10764.18

FLOW VELOCITY(FEET/SEC.) = 19.42 FLOW DEPTH(FEET) = 11.84

TRAVEL TIME(MIN.) = 4.67 Tc(MIN.) = 90.42

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 90.42

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.178

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	96.50	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.70	0.40	0.50	32
NATURAL FAIR COVER					
"OPEN BRUSH"	A	12.00	0.40	1.00	46
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	A	30.00	0.40	1.00	55
NATURAL FAIR COVER					
"WOODLAND"	A	91.00	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	37.50	0.30	1.00	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.39

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 267.70

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.58;30M= 1.01;1H= 1.44;3H= 2.84;6H= 4.38;24H= 7.88  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.1%  
 MOUNTAIN= 85.8%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.51; LAG(HR) = 1.21; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.55; 30M = 0.58; 1HR = 0.59;  
 3HR = 0.90; 6HR = 0.95; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 17690.20  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0300; Lca/L=0.4,n=.0269; Lca/L=0.5,n=.0247;Lca/L=0.6,n=.0231  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 7744.06  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 10601.21  
 TOTAL AREA(ACRES) = 17690.20 PEAK FLOW RATE(CFS) = 10764.18  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.54; 30M = 0.98; 1HR = 1.38; 3HR = 2.65; 6HR = 4.03; 24HR = 7.16

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 90.42  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.358  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	1.30	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	2.40	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	17.50	0.30	1.00	69
COMMERCIAL	B	2.20	0.30	0.10	56
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	B	15.70	0.30	1.00	72
NATURAL FAIR COVER					
"WOODLAND"	B	206.30	0.30	1.00	60

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 245.40  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.58;30M= 1.01;1H= 1.43;3H= 2.84;6H= 4.37;24H= 7.87  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.1%  
 MOUNTAIN= 85.7%;FOOTHILL= 6.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.51; LAG(HR) = 1.21; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.55; 30M = 0.57; 1HR = 0.59;  
 3HR = 0.90; 6HR = 0.95; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 17935.60  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0300; Lca/L=0.4,n=.0269; Lca/L=0.5,n=.0247;Lca/L=0.6,n=.0231  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 7805.96  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 10683.56  
 TOTAL AREA(ACRES) = 17935.60 PEAK FLOW RATE(CFS) = 10764.18  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.54; 30M = 0.98; 1HR = 1.38; 3HR = 2.65; 6HR = 4.03; 24HR = 7.16

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 90.42  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.358  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	1027.50	0.25	1.00	75
NATURAL FAIR COVER					
"MEADOWS"	C	2.90	0.25	1.00	80
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	0.40	0.25	0.50	69
NATURAL FAIR COVER					
"GRASS"	C	17.00	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	163.50	0.25	1.00	77
COMMERCIAL	C	1.10	0.25	0.10	69

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1212.40  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.58;30M= 1.00;1H= 1.43;3H= 2.83;6H= 4.35;24H= 7.82  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.4%  
 MOUNTAIN= 85.2%;FOOTHILL= 6.4%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.51; LAG(HR) = 1.21; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.54; 30M = 0.56; 1HR = 0.58;  
 3HR = 0.89; 6HR = 0.95; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 19148.00  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0300; Lca/L=0.4,n=.0269; Lca/L=0.5,n=.0247;Lca/L=0.6,n=.0231  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 8226.46  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 11159.51  
 TOTAL AREA(ACRES) = 19148.00 PEAK FLOW RATE(CFS) = 11159.51

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.54; 30M = 0.98; 1HR = 1.38; 3HR = 2.65; 6HR = 4.03; 24HR = 7.16

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 90.42  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.358  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	572.50	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	252.80	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	1472.40	0.20	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	D	295.00	0.20	1.00	79
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	0.90	0.20	0.50	75
NATURAL FAIR COVER					
"GRASS"	D	2.10	0.20	1.00	84

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 2595.70  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.58;30M= 1.00;1H= 1.42;3H= 2.81;6H= 4.31;24H= 7.75  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.8%  
 MOUNTAIN= 84.4%;FOOTHILL= 6.8%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.51; LAG(HR) = 1.21; Fm(INCH/HR) = 0.23; Ybar = 0.35

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.54; 30M = 0.98; 1HR = 1.38; 3HR = 2.65; 6HR = 4.03; 24HR = 7.16

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.51; 30M = 0.54; 1HR = 0.55;  
 3HR = 0.88; 6HR = 0.95; 24HR = 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 21743.70  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0300; Lca/L=0.4,n=.0269; Lca/L=0.5,n=.0247;Lca/L=0.6,n=.0231  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 9218.58  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 12231.33  
 TOTAL AREA(ACRES) = 21743.70 PEAK FLOW RATE(CFS) = 12231.33

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.54; 30M = 0.98; 1HR = 1.38; 3HR = 2.65; 6HR = 4.03; 24HR = 7.16

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81

-----  
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<  
 =====

MAINLINE Tc(MIN) = 90.42  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.358  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	D	407.80	0.20	1.00	83
COMMERCIAL	D	0.90	0.20	0.10	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	1735.70	0.20	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 2144.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.57;30M= 1.00;1H= 1.42;3H= 2.79;6H= 4.29;24H= 7.69  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
 MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.51; LAG(HR) = 1.21; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.49; 30M = 0.52; 1HR = 0.54;  
 3HR = 0.87; 6HR = 0.94; 24HR = 0.96  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 23888.10  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0300; Lca/L=0.4,n=.0269; Lca/L=0.5,n=.0247;Lca/L=0.6,n=.0231  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 10119.33  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13167.55  
 TOTAL AREA(ACRES) = 23888.10 PEAK FLOW RATE(CFS) = 13167.55

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.54; 30M = 0.98; 1HR = 1.38; 3HR = 2.65; 6HR = 4.03; 24HR = 7.16

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 23888.10 TC(MIN.) = 90.42  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.34  
 PEAK FLOW RATE(CFS) = 13167.55  
 =====

=====  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS  
 =====

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU59100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.070  
MOUNTAIN 0.840  
VALLEY(UNDEVELOPED)/DESERT 0.080  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1058.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU58100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 13167.55 Tc(MIN.) = 90.42  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.34  
TOTAL AREA(ACRES) = 23888.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1058.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 13167.55 Tc(MIN.) = 90.42  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.34  
TOTAL AREA(ACRES) = 23888.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1058.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 657.00 DOWNSTREAM(FEET) = 630.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2185.00 CHANNEL SLOPE = 0.0124  
CHANNEL BASE(FEET) = 50.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 13167.55  
FLOW VELOCITY(FEET/SEC.) = 17.69 FLOW DEPTH(FEET) = 12.00  
TRAVEL TIME(MIN.) = 2.06 Tc(MIN.) = 92.48  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 92.48  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.163  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 21.30 0.40 1.00 40  
NATURAL FAIR COVER  
"OPEN BRUSH" A 15.80 0.40 1.00 46  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" A 8.90 0.40 1.00 55  
NATURAL FAIR COVER  
"WOODLAND" A 23.80 0.40 1.00 36  
COMMERCIAL B 0.70 0.30 0.10 56  
NATURAL FAIR COVER  
"WOODLAND" B 2.50 0.30 1.00 60  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 73.00  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.57;30M= 1.00;1H= 1.42;3H= 2.79;6H= 4.28;24H= 7.69

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.54; LAG(HR) = 1.23; Fm(INCH/HR) = 0.23; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.49; 30M = 0.52; 1HR = 0.54;  
3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 23961.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0299; Lca/L=0.4,n=.0268; Lca/L=0.5,n=.0246;Lca/L=0.6,n=.0230  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 10119.20  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13033.89  
TOTAL AREA(ACRES) = 23961.10 PEAK FLOW RATE(CFS) = 13167.55  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.45; 30M = 0.91; 1HR = 1.24; 3HR = 2.21; 6HR = 3.21; 24HR = 5.51

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 92.48  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.347  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 403.90 0.25 1.00 75  
NATURAL POOR COVER  
"BARREN" C 3.80 0.25 1.00 91  
NATURAL FAIR COVER  
"GRASS" C 7.00 0.25 1.00 79  
NATURAL FAIR COVER  
"OPEN BRUSH" C 145.40 0.25 1.00 77  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 167.50 0.25 1.00 81  
NATURAL FAIR COVER  
"WOODLAND" C 36.90 0.25 1.00 73

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 764.50  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.57;30M= 1.00;1H= 1.41;3H= 2.77;6H= 4.25;24H= 7.62  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.54; LAG(HR) = 1.23; Fm(INCH/HR) = 0.23; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.48; 30M = 0.52; 1HR = 0.54;  
3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 24725.60  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0299; Lca/L=0.4,n=.0268; Lca/L=0.5,n=.0246;Lca/L=0.6,n=.0230  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 10293.78  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13235.89  
TOTAL AREA(ACRES) = 24725.60 PEAK FLOW RATE(CFS) = 13235.89

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.45; 30M = 0.91; 1HR = 1.24; 3HR = 2.21; 6HR = 3.21; 24HR = 5.51

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 92.48

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.347  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 289.70 0.20 1.00 81  
NATURAL FAIR COVER  
"MEADOWS" D 0.20 0.20 1.00 84  
NATURAL FAIR COVER  
"GRASS" D 0.10 0.20 1.00 84  
NATURAL FAIR COVER  
"OPEN BRUSH" D 117.70 0.20 1.00 83  
COMMERCIAL D 3.40 0.20 0.10 75  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" D 287.30 0.20 1.00 86  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 698.40

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.56;30M= 0.99;1H= 1.41;3H= 2.76;6H= 4.22;24H= 7.56

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.54; LAG(HR) = 1.23; Fm(INCH/HR) = 0.23; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.48; 30M = 0.51; 1HR = 0.53;  
3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 25424.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0299; Lca/L=0.4,n=.0268; Lca/L=0.5,n=.0246;Lca/L=0.6,n=.0230  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 10491.20  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13448.81  
TOTAL AREA(ACRES) = 25424.00 PEAK FLOW RATE(CFS) = 13448.81

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.45; 30M = 0.91; 1HR = 1.24; 3HR = 2.21; 6HR = 3.21; 24HR = 5.51

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 92.48  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.347  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"WOODLAND" D 45.00 0.20 1.00 79  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 45.00

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.56;30M= 0.99;1H= 1.41;3H= 2.76;6H= 4.22;24H= 7.56  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.54; LAG(HR) = 1.23; Fm(INCH/HR) = 0.23; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.48; 30M = 0.51; 1HR = 0.53;  
3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 25469.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0299; Lca/L=0.4,n=.0268; Lca/L=0.5,n=.0246;Lca/L=0.6,n=.0230  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 10502.53  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13461.68  
TOTAL AREA(ACRES) = 25469.00 PEAK FLOW RATE(CFS) = 13461.68



SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.45; 30M = 0.91; 1HR = 1.24; 3HR = 2.21; 6HR = 3.21; 24HR = 5.51

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 25469.00 TC(MIN.) = 92.48

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.34

PEAK FLOW RATE(CFS) = 13461.68

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU60100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	7.600
2)	10.000;	4.500
3)	15.000;	3.500
4)	20.000;	2.750
5)	30.000;	2.100
6)	60.000;	1.520
7)	120.000;	1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.070
MOUNTAIN	0.840
VALLEY(UNDEVELOPED)/DESERT	0.080
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1059.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU59100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 13461.68 Tc(MIN.) = 92.48  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.34  
TOTAL AREA(ACRES) = 25469.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1059.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 13461.68 Tc(MIN.) = 92.48  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.34  
TOTAL AREA(ACRES) = 25469.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1059.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 630.00 DOWNSTREAM(FEET) = 518.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 7828.00 CHANNEL SLOPE = 0.0143  
CHANNEL BASE(FEET) = 50.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 13461.68  
FLOW VELOCITY(FEET/SEC.) = 18.74 FLOW DEPTH(FEET) = 11.65  
TRAVEL TIME(MIN.) = 6.96 Tc(MIN.) = 99.44  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 99.44  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.115  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	A	37.80	0.40	1.00	40
NATURAL FAIR COVER "OPEN BRUSH"	A	124.10	0.40	1.00	46
COMMERCIAL	A	3.70	0.40	0.10	32
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	A	0.20	0.40	1.00	55
NATURAL FAIR COVER "WOODLAND"	A	68.90	0.40	1.00	36
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	17.60	0.30	1.00	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.39  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 252.30  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.56;30M= 0.99;1H= 1.41;3H= 2.75;6H= 4.20;24H= 7.53

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.66; LAG(HR) = 1.33; Fm(INCH/HR) = 0.23; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.47; 30M = 0.51; 1HR = 0.53;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 25721.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0294; Lca/L=0.4,n=.0264; Lca/L=0.5,n=.0242;Lca/L=0.6,n=.0226  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 10486.17  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13282.04  
TOTAL AREA(ACRES) = 25721.30 PEAK FLOW RATE(CFS) = 13461.68  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 99.44  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.310  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"GRASS" B 1.30 0.30 1.00 69  
NATURAL FAIR COVER  
"OPEN BRUSH" B 11.80 0.30 1.00 66  
COMMERCIAL B 5.10 0.30 0.10 56  
NATURAL FAIR COVER  
"WOODLAND" B 18.00 0.30 1.00 60  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 209.70 0.25 1.00 75  
NATURAL POOR COVER  
"BARREN" C 2.50 0.25 1.00 91

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98  
SUBAREA AREA(ACRES) = 248.40

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.56;30M= 0.99;1H= 1.40;3H= 2.74;6H= 4.19;24H= 7.50  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.66; LAG(HR) = 1.33; Fm(INCH/HR) = 0.23; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.47; 30M = 0.51; 1HR = 0.53;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 25969.71  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0294; Lca/L=0.4,n=.0264; Lca/L=0.5,n=.0242;Lca/L=0.6,n=.0226  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 10520.47  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13329.42  
TOTAL AREA(ACRES) = 25969.71 PEAK FLOW RATE(CFS) = 13461.68  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 99.44

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.310  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"GRASS" C 28.40 0.25 1.00 79  
NATURAL FAIR COVER  
"OPEN BRUSH" C 502.60 0.25 1.00 77  
COMMERCIAL C 1.30 0.25 0.10 69  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 6.10 0.25 1.00 81  
NATURAL FAIR COVER  
"WOODLAND" C 9.90 0.25 1.00 73  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 46.10 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 594.40  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.56;30M= 0.99;1H= 1.40;3H= 2.72;6H= 4.16;24H= 7.43

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.66; LAG(HR) = 1.33; Fm(INCH/HR) = 0.23; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.47; 30M = 0.50; 1HR = 0.52;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 26564.11  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0294; Lca/L=0.4,n=.0264; Lca/L=0.5,n=.0242;Lca/L=0.6,n=.0226  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 10616.16  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13449.27  
TOTAL AREA(ACRES) = 26564.11 PEAK FLOW RATE(CFS) = 13461.68  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 99.44  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.310  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"GRASS" D 30.10 0.20 1.00 84  
NATURAL FAIR COVER  
"OPEN BRUSH" D 129.80 0.20 1.00 83  
COMMERCIAL D 1.70 0.20 0.10 75  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" D 38.00 0.20 1.00 86  
NATURAL FAIR COVER  
"WOODLAND" D 91.10 0.20 1.00 79  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 290.70

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.56;30M= 0.99;1H= 1.40;3H= 2.72;6H= 4.14;24H= 7.40  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.66; LAG(HR) = 1.33; Fm(INCH/HR) = 0.23; Ybar = 0.36  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.47; 30M = 0.50; 1HR = 0.52;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96

UNIT-INTERVAL(MIN) = 10.00    TOTAL AREA(ACRES) = 26854.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0294; Lca/L=0.4,n=.0264; Lca/L=0.5,n=.0242;Lca/L=0.6,n=.0226  
TIME OF PEAK FLOW(HR) = 17.00    RUNOFF VOLUME(AF) = 10674.95  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13518.31  
TOTAL AREA(ACRES) = 26854.80    PEAK FLOW RATE(CFS) = 13518.31

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES)        = 26854.80    TC(MIN.) =        99.44  
AREA-AVERAGED Fm(INCH/HR)= 0.23    Ybar = 0.36  
PEAK FLOW RATE(CFS)     = 13518.31

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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430 Exchange, Suite 200  
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714 - 734 - 5100

-----  
FILE NAME: LU61100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	7.600
2)	10.000;	4.500
3)	15.000;	3.500
4)	20.000;	2.750
5)	30.000;	2.100
6)	60.000;	1.520
7)	120.000;	1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.130
MOUNTAIN	0.660
VALLEY(UNDEVELOPED)/DESERT	0.200
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1060.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU60100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 13518.31 Tc(MIN.) = 99.44  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.36  
TOTAL AREA(ACRES) = 26854.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1060.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 13518.31 Tc(MIN.) = 99.44  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.36  
TOTAL AREA(ACRES) = 26854.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1060.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 518.00 DOWNSTREAM(FEET) = 435.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 8004.00 CHANNEL SLOPE = 0.0104  
CHANNEL BASE(FEET) = 55.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 13518.31  
FLOW VELOCITY(FEET/SEC.) = 16.54 FLOW DEPTH(FEET) = 12.17  
TRAVEL TIME(MIN.) = 8.06 Tc(MIN.) = 107.51  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 107.51  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.067  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	A	72.70	0.40	1.00	40
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	9.10	0.40	0.50	32
NATURAL POOR COVER "BARREN"	A	0.20	0.40	1.00	78
NATURAL FAIR COVER "GRASS"	A	4.00	0.40	1.00	50
NATURAL FAIR COVER "OPEN BRUSH"	A	97.50	0.40	1.00	46
COMMERCIAL	A	8.10	0.40	0.10	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
SUBAREA AREA(ACRES) = 191.60  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.56;30M= 0.99;1H= 1.40;3H= 2.71;6H= 4.14;24H= 7.39

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.2%  
MOUNTAIN= 83.7%;FOOTHILL= 7.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.79; LAG(HR) = 1.43; Fm(INCH/HR) = 0.23; Ybar = 0.36  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.46; 30M = 0.50; 1HR = 0.52;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 27046.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0292; Lca/L=0.4,n=.0262; Lca/L=0.5,n=.0241;Lca/L=0.6,n=.0225  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 10684.73  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13323.75  
TOTAL AREA(ACRES) = 27046.40 PEAK FLOW RATE(CFS) = 13518.31  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.47; 30M = 0.92; 1HR = 1.26; 3HR = 2.29; 6HR = 3.35; 24HR = 5.79

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
MAINLINE Tc(MIN) = 107.51  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.267  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" A 8.70 0.40 1.00 55  
NATURAL FAIR COVER  
"WOODLAND" A 70.50 0.40 1.00 36  
NATURAL FAIR COVER  
"GRASS" B 0.80 0.30 1.00 69  
NATURAL FAIR COVER  
"OPEN BRUSH" B 18.30 0.30 1.00 66  
COMMERCIAL B 2.90 0.30 0.10 56  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" B 1.60 0.30 1.00 72  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.38  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97  
SUBAREA AREA(ACRES) = 102.80

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.56;30M= 0.99;1H= 1.39;3H= 2.71;6H= 4.13;24H= 7.38  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.2%  
MOUNTAIN= 83.6%;FOOTHILL= 7.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.79; LAG(HR) = 1.43; Fm(INCH/HR) = 0.23; Ybar = 0.36  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.46; 30M = 0.50; 1HR = 0.52;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 27149.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0292; Lca/L=0.4,n=.0262; Lca/L=0.5,n=.0241;Lca/L=0.6,n=.0225  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 10689.75  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13336.43  
TOTAL AREA(ACRES) = 27149.20 PEAK FLOW RATE(CFS) = 13518.31  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.47; 30M = 0.92; 1HR = 1.26; 3HR = 2.29; 6HR = 3.35; 24HR = 5.79

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
MAINLINE Tc(MIN) = 107.51

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.267  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"WOODLAND" B 16.20 0.30 1.00 60  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1119.80 0.25 1.00 75  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" C 17.10 0.25 0.50 69  
NATURAL POOR COVER  
"BARREN" C 18.20 0.25 1.00 91  
NATURAL FAIR COVER  
"GRASS" C 128.60 0.25 1.00 79  
NATURAL FAIR COVER  
"OPEN BRUSH" C 739.90 0.25 1.00 77

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 2039.80  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.55;30M= 0.98;1H= 1.39;3H= 2.68;6H= 4.08;24H= 7.27  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 9.0%

MOUNTAIN= 82.4%;FOOTHILL= 7.6%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.79; LAG(HR) = 1.43; Fm(INCH/HR) = 0.23; Ybar = 0.37  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.45; 30M = 0.49; 1HR = 0.51;  
3HR = 0.85; 6HR = 0.93; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 29189.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0292; Lca/L=0.4,n=.0262; Lca/L=0.5,n=.0241;Lca/L=0.6,n=.0225  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 11188.29  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13862.52  
TOTAL AREA(ACRES) = 29189.00 PEAK FLOW RATE(CFS) = 13862.52

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.47; 30M = 0.92; 1HR = 1.26; 3HR = 2.29; 6HR = 3.35; 24HR = 5.79

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
MAINLINE Tc(MIN) = 107.51  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.267  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
COMMERCIAL C 0.10 0.25 0.10 69  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 195.30 0.25 1.00 81  
NATURAL FAIR COVER  
"WOODLAND" C 132.20 0.25 1.00 73  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 1067.40 0.20 1.00 81  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" D 23.60 0.20 0.50 75  
NATURAL POOR COVER  
"BARREN" D 34.20 0.20 1.00 93  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 1452.80

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.55;30M= 0.98;1H= 1.38;3H= 2.66;6H= 4.04;24H= 7.20  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 9.5%  
MOUNTAIN= 81.6%;FOOTHILL= 7.8%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.79; LAG(HR) = 1.43; Fm(INCH/HR) = 0.23; Ybar = 0.37  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.44; 30M = 0.48; 1HR = 0.50;  
 3HR = 0.85; 6HR = 0.93; 24HR= 0.96  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 30641.80  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0292; Lca/L=0.4,n=.0262; Lca/L=0.5,n=.0241;Lca/L=0.6,n=.0225  
 TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 11595.00  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14268.09  
 TOTAL AREA(ACRES) = 30641.80 PEAK FLOW RATE(CFS) = 14268.09

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.47; 30M = 0.92; 1HR = 1.26; 3HR = 2.29; 6HR = 3.35; 24HR = 5.79

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 107.51  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.267  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "GRASS"	D	99.70	0.20	1.00	84
NATURAL FAIR COVER "OPEN BRUSH"	D	651.20	0.20	1.00	83
COMMERCIAL	D	3.60	0.20	0.10	75
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	574.70	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	210.30	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1539.50

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.54;30M= 0.98;1H= 1.37;3H= 2.65;6H= 4.01;24H= 7.13  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 10.0%  
 MOUNTAIN= 80.9%;FOOTHILL= 8.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.79; LAG(HR) = 1.43; Fm(INCH/HR) = 0.23; Ybar = 0.37  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.43; 30M = 0.47; 1HR = 0.49;  
 3HR = 0.84; 6HR = 0.93; 24HR= 0.96  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 32181.30  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0292; Lca/L=0.4,n=.0262; Lca/L=0.5,n=.0241;Lca/L=0.6,n=.0225  
 TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 12056.77  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14708.45  
 TOTAL AREA(ACRES) = 32181.30 PEAK FLOW RATE(CFS) = 14708.45

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.47; 30M = 0.92; 1HR = 1.26; 3HR = 2.29; 6HR = 3.35; 24HR = 5.79

=====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 32181.30 TC(MIN.) = 107.51  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.37  
 PEAK FLOW RATE(CFS) = 14708.45

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LU62100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
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

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / PARK- SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.310  
MOUNTAIN 0.260  
VALLEY(UNDEVELOPED)/DESERT 0.420  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1061.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU61100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 14708.45 Tc(MIN.) = 107.51  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.37  
TOTAL AREA(ACRES) = 32181.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1061.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 14708.45 Tc(MIN.) = 107.51  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.37  
TOTAL AREA(ACRES) = 32181.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1061.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 435.00 DOWNSTREAM(FEET) = 345.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 8275.00 CHANNEL SLOPE = 0.0109  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 14708.45  
FLOW VELOCITY(FEET/SEC.) = 17.01 FLOW DEPTH(FEET) = 12.01  
TRAVEL TIME(MIN.) = 8.11 Tc(MIN.) = 115.61  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 115.61  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.023  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	36.50	0.40	1.00	40
NATURAL FAIR COVER					
"WOODLAND"	A	444.40	0.40	1.00	36
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	1.00	0.40	0.50	32
NATURAL POOR COVER					
"BARREN"	A	6.90	0.40	1.00	78
NATURAL FAIR COVER					
"GRASS"	A	60.30	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	2.20	0.40	1.00	44

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 551.30  
UNIT-HYDROGRAPH DATA:



RAINFALL(INCH): 5M= 0.54;30M= 0.98;1H= 1.37;3H= 2.64;6H= 4.00;24H= 7.11  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 10.6%  
MOUNTAIN= 79.9%;FOOTHILL= 8.5%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.93; LAG(HR) = 1.54; Fm(INCH/HR) = 0.23; Ybar = 0.38  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.43; 30M = 0.46; 1HR = 0.49;  
3HR = 0.84; 6HR = 0.93; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 32732.61  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0290; Lca/L=0.4,n=.0260; Lca/L=0.5,n=.0239;Lca/L=0.6,n=.0223  
TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 11998.96  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14205.60  
TOTAL AREA(ACRES) = 32732.61 PEAK FLOW RATE(CFS) = 14708.45  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.46; 30M = 0.91; 1HR = 1.24; 3HR = 2.22; 6HR = 3.23; 24HR = 5.54

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
MAINLINE Tc(MIN) = 115.61  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.223  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN FAIR COVER					
"TURF"	A	1.30	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	138.50	0.40	1.00	46
COMMERCIAL	A	5.60	0.40	0.10	32
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	A	1.80	0.40	1.00	55
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	13.80	0.30	1.00	63
AGRICULTURAL POOR COVER					
"FALLOW"	B	2.70	0.30	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.39  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97  
SUBAREA AREA(ACRES) = 163.70  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.54;30M= 0.97;1H= 1.37;3H= 2.64;6H= 3.99;24H= 7.10  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 10.7%  
MOUNTAIN= 79.7%;FOOTHILL= 8.6%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.93; LAG(HR) = 1.54; Fm(INCH/HR) = 0.23; Ybar = 0.38  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.42; 30M = 0.46; 1HR = 0.49;  
3HR = 0.84; 6HR = 0.93; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 32896.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0290; Lca/L=0.4,n=.0260; Lca/L=0.5,n=.0239;Lca/L=0.6,n=.0223  
TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 12006.43  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14221.10  
TOTAL AREA(ACRES) = 32896.30 PEAK FLOW RATE(CFS) = 14708.45  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.46; 30M = 0.91; 1HR = 1.24; 3HR = 2.22; 6HR = 3.23; 24HR = 5.54

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 115.61  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.223  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	2.30	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	5.00	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	51.10	0.30	1.00	69
URBAN FAIR COVER					
"TURF"	B	10.00	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	258.20	0.30	1.00	66
COMMERCIAL	B	64.50	0.30	0.10	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.85  
SUBAREA AREA(ACRES) = 391.10  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.54;30M= 0.97;1H= 1.37;3H= 2.63;6H= 3.98;24H= 7.08  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 11.1%  
MOUNTAIN= 79.0%;FOOTHILL= 8.8%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.93; LAG(HR) = 1.54; Fm(INCH/HR) = 0.23; Ybar = 0.38  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.42; 30M = 0.46; 1HR = 0.49;  
3HR = 0.84; 6HR = 0.93; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 33287.41  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0290; Lca/L=0.4,n=.0260; Lca/L=0.5,n=.0239;Lca/L=0.6,n=.0223  
TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 12081.80  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14306.09  
TOTAL AREA(ACRES) = 33287.41 PEAK FLOW RATE(CFS) = 14708.45  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.46; 30M = 0.91; 1HR = 1.24; 3HR = 2.22; 6HR = 3.23; 24HR = 5.54

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
MAINLINE Tc(MIN) = 115.61  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.223  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	B	6.20	0.30	0.85	56
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	B	17.10	0.30	1.00	72
NATURAL FAIR COVER					
"WOODLAND"	B	74.10	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	1292.00	0.25	1.00	75
NATURAL FAIR COVER					
"WOODLAND"	C	636.80	0.25	1.00	73
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	6.90	0.25	0.50	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 2033.10  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.53;30M= 0.97;1H= 1.36;3H= 2.61;6H= 3.94;24H= 6.99  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 12.9%  
MOUNTAIN= 76.0%;FOOTHILL= 10.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.93; LAG(HR) = 1.54; Fm(INCH/HR) = 0.24; Ybar = 0.39

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.41; 30M = 0.45; 1HR = 0.48;  
 3HR = 0.83; 6HR = 0.92; 24HR = 0.95  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 35320.51  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0290; Lca/L=0.4,n=.0260; Lca/L=0.5,n=.0239;Lca/L=0.6,n=.0223  
 TIME OF PEAK FLOW(HR) = 17.25 RUNOFF VOLUME(AF) = 12500.31  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14753.56  
 TOTAL AREA(ACRES) = 35320.51 PEAK FLOW RATE(CFS) = 14753.56

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.46; 30M = 0.91; 1HR = 1.24; 3HR = 2.22; 6HR = 3.23; 24HR = 5.54

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 115.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.223

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER "BARREN"	C	40.70	0.25	1.00	91
NATURAL FAIR COVER "GRASS"	C	190.10	0.25	1.00	79
URBAN FAIR COVER "TURF"	C	87.00	0.25	1.00	77
NATURAL FAIR COVER "OPEN BRUSH"	C	2310.80	0.25	1.00	77
COMMERCIAL	C	161.30	0.25	0.10	69
PUBLIC PARK	C	8.70	0.25	0.85	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95

SUBAREA AREA(ACRES) = 2798.60

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.53;30M= 0.97;1H= 1.35;3H= 2.58;6H= 3.89;24H= 6.88

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 15.0%

MOUNTAIN= 72.3%;FOOTHILL= 11.7%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.93; LAG(HR) = 1.54; Fm(INCH/HR) = 0.24; Ybar = 0.39

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.40; 30M = 0.44; 1HR = 0.47;

3HR = 0.82; 6HR = 0.92; 24HR = 0.95

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 38119.11

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0290; Lca/L=0.4,n=.0260; Lca/L=0.5,n=.0239;Lca/L=0.6,n=.0223

TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 13162.02

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 15488.28

TOTAL AREA(ACRES) = 38119.11 PEAK FLOW RATE(CFS) = 15488.28

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.46; 30M = 0.91; 1HR = 1.24; 3HR = 2.22; 6HR = 3.23; 24HR = 5.54

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 115.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.223

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	C	389.30	0.25	1.00	81

NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	1418.60	0.20	1.00	81
NATURAL FAIR COVER "MEADOWS"	D	3.10	0.20	1.00	84
NATURAL FAIR COVER "WOODLAND"	D	963.30	0.20	1.00	79
RESIDENTIAL "5-7 DWELLINGS/ACRE"	D	0.80	0.20	0.50	75
NATURAL POOR COVER "BARREN"	D	84.90	0.20	1.00	93

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 2860.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.52;30M= 0.96;1H= 1.34;3H= 2.55;6H= 3.84;24H= 6.79

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 16.9%

MOUNTAIN= 69.1%;FOOTHILL= 13.0%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.93; LAG(HR) = 1.54; Fm(INCH/HR) = 0.23; Ybar = 0.39

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.38; 30M = 0.43; 1HR = 0.46;

3HR = 0.81; 6HR = 0.92; 24HR = 0.95

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 40979.11

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0290; Lca/L=0.4,n=.0260; Lca/L=0.5,n=.0239;Lca/L=0.6,n=.0223

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 13890.64

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 16300.31

TOTAL AREA(ACRES) = 40979.11 PEAK FLOW RATE(CFS) = 16300.31

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.46; 30M = 0.91; 1HR = 1.24; 3HR = 2.22; 6HR = 3.23; 24HR = 5.54

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 115.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.223

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "GRASS"	D	865.20	0.20	1.00	84

AGRICULTURAL FAIR COVER

"ORCHARDS"

URBAN FAIR COVER

"TURF"

NATURAL FAIR COVER

"OPEN BRUSH"

COMMERCIAL

PUBLIC PARK

D 2760.50 0.20 1.00 83

D 225.30 0.20 0.10 75

D 2.90 0.20 0.85 75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95

SUBAREA AREA(ACRES) = 3911.90

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.52;30M= 0.96;1H= 1.34;3H= 2.52;6H= 3.79;24H= 6.68

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 19.1%

MOUNTAIN= 65.3%;FOOTHILL= 14.6%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.93; LAG(HR) = 1.54; Fm(INCH/HR) = 0.23; Ybar = 0.39

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.41; 1HR = 0.45;

3HR = 0.80; 6HR = 0.91; 24HR = 0.95

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 44891.01

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0290; Lca/L=0.4,n=.0260; Lca/L=0.5,n=.0239;Lca/L=0.6,n=.0223

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 14986.95

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 17507.32  
TOTAL AREA(ACRES) = 44891.01 PEAK FLOW RATE(CFS) = 17507.32

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.46; 30M = 0.91; 1HR = 1.24; 3HR = 2.22; 6HR = 3.23; 24HR = 5.54

\*\*\*\*\*

FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

MAINLINE Tc(MIN) = 115.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.223

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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NATURAL GOOD COVER

"MEADOWS"	D	0.20	0.20	1.00	78
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NATURAL FAIR COVER

"CHAPARRAL,NARROWLEAF"	D	1546.10	0.20	1.00	86
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 1546.30

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.52;30M= 0.96;1H= 1.33;3H= 2.51;6H= 3.77;24H= 6.64

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 19.9%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.93; LAG(HR) = 1.54; Fm(INCH/HR) = 0.23; Ybar = 0.38

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.41; 1HR = 0.44;

3HR = 0.79; 6HR = 0.91; 24HR= 0.95

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 46437.31

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0290; Lca/L=0.4,n=.0260; Lca/L=0.5,n=.0239;Lca/L=0.6,n=.0223

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 15436.40

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 17976.47

TOTAL AREA(ACRES) = 46437.31 PEAK FLOW RATE(CFS) = 17976.47

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.46; 30M = 0.91; 1HR = 1.24; 3HR = 2.22; 6HR = 3.23; 24HR = 5.54

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 46437.31 TC(MIN.) = 115.61

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.38

PEAK FLOW RATE(CFS) = 17976.47

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

**PRELIMINARY DRAFT – FOR INTERNAL USE ONLY**

**TECHNICAL APPENDIX I-A  
HYDROLOGIC ANALYSIS  
UPSTREAM AREAS  
100-YEAR HIGH CONFIDENCE**

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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-----  
FILE NAME: LU35100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.000  
FOOTHILL 0.030  
MOUNTAIN 0.920  
VALLEY(UNDEVELOPED)/DESERT 0.050  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1000.00 TO NODE 1001.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
=====

INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00  
ELEVATION DATA: UPSTREAM(FEET) = 3210.00 DOWNSTREAM(FEET) = 3190.00

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 12.581  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.647  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1.30 0.25 1.00 75 12.58  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA RUNOFF(CFS) = 3.97  
TOTAL AREA(ACRES) = 1.30 PEAK FLOW RATE(CFS) = 3.97

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1001.00 TO NODE 1002.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3190.00 DOWNSTREAM(FEET) = 3175.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 154.00 CHANNEL SLOPE = 0.0974  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 3.97  
FLOW VELOCITY(FEET/SEC.) = 4.53 FLOW DEPTH(FEET) = 0.56  
TRAVEL TIME(MIN.) = 0.57 Tc(MIN.) = 13.15  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1002.00 = 484.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1001.00 TO NODE 1002.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 13.15  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.056  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1.20 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1.20 SUBAREA RUNOFF(CFS) = 5.19  
EFFECTIVE AREA(ACRES) = 2.50 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 2.50 PEAK FLOW RATE(CFS) = 10.81

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1002.00 TO NODE 1003.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 3175.00 DOWNSTREAM(FEET) = 3160.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 136.00 CHANNEL SLOPE = 0.1103  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000

MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 10.81  
FLOW VELOCITY(FEET/SEC.) = 6.14 FLOW DEPTH(FEET) = 0.92  
TRAVEL TIME(MIN.) = 0.37 Tc(MIN.) = 13.52  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1003.00 = 620.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1002.00 TO NODE 1003.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 13.52  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.945  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 0.30 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 2.10 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 2.40 SUBAREA RUNOFF(CFS) = 10.13  
EFFECTIVE AREA(ACRES) = 4.90 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 4.90 PEAK FLOW RATE(CFS) = 20.69

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1003.00 TO NODE 1004.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3160.00 DOWNSTREAM(FEET) = 3120.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 357.00 CHANNEL SLOPE = 0.1120  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 20.69  
FLOW VELOCITY(FEET/SEC.) = 7.15 FLOW DEPTH(FEET) = 0.97  
TRAVEL TIME(MIN.) = 0.83 Tc(MIN.) = 14.35  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1004.00 = 977.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1003.00 TO NODE 1004.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 14.35  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.695  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 0.10 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 3.20 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 3.30 SUBAREA RUNOFF(CFS) = 13.20  
EFFECTIVE AREA(ACRES) = 8.20 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 8.20 PEAK FLOW RATE(CFS) = 32.79

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1004.00 TO NODE 1005.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3120.00 DOWNSTREAM(FEET) = 3100.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 332.00 CHANNEL SLOPE = 0.0602  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 32.79  
FLOW VELOCITY(FEET/SEC.) = 6.43 FLOW DEPTH(FEET) = 1.47  
TRAVEL TIME(MIN.) = 0.86 Tc(MIN.) = 15.21  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1005.00 = 1309.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1004.00 TO NODE 1005.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 15.21  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.462  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 5.50 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 5.50 SUBAREA RUNOFF(CFS) = 20.85  
EFFECTIVE AREA(ACRES) = 13.70 AREA-AVERAGED Fm(INCH/HR) = 0.25  
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 13.70 PEAK FLOW RATE(CFS) = 51.92

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1005.00 TO NODE 1006.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3100.00 DOWNSTREAM(FEET) = 3080.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 195.00 CHANNEL SLOPE = 0.1026  
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 51.92  
FLOW VELOCITY(FEET/SEC.) = 8.84 FLOW DEPTH(FEET) = 1.62  
TRAVEL TIME(MIN.) = 0.37 Tc(MIN.) = 15.58  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1006.00 = 1504.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1005.00 TO NODE 1006.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 15.58  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.396  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 7.80 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 7.80 SUBAREA RUNOFF(CFS) = 29.11

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EFFECTIVE AREA(ACRES) = 21.50 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 21.50 PEAK FLOW RATE(CFS) = 80.21

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1006.00 TO NODE 1007.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3080.00 DOWNSTREAM(FEET) = 3075.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 220.00 CHANNEL SLOPE = 0.0227
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00
CHANNEL FLOW THRU SUBAREA(CFS) = 80.21
FLOW VELOCITY(FEET/SEC.) = 5.59 FLOW DEPTH(FEET) = 2.57
TRAVEL TIME(MIN.) = 0.66 Tc(MIN.) = 16.23
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1007.00 = 1724.00 FEET.

*****
FLOW PROCESS FROM NODE 1006.00 TO NODE 1007.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 16.23
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.278
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 10.10 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 10.10 SUBAREA RUNOFF(CFS) = 36.61
EFFECTIVE AREA(ACRES) = 31.60 AREA-AVERAGED Fm(INCH/HR) = 0.25
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 31.60 PEAK FLOW RATE(CFS) = 114.54

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1007.00 TO NODE 1008.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3075.00 DOWNSTREAM(FEET) = 3060.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 340.00 CHANNEL SLOPE = 0.0441
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00
CHANNEL FLOW THRU SUBAREA(CFS) = 114.54
FLOW VELOCITY(FEET/SEC.) = 7.85 FLOW DEPTH(FEET) = 2.60
TRAVEL TIME(MIN.) = 0.72 Tc(MIN.) = 16.96
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1008.00 = 2064.00 FEET.

*****
FLOW PROCESS FROM NODE 1007.00 TO NODE 1008.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 16.96
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.148
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS

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LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B 14.60 0.30 1.00 63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 4.60 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.29
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 19.20 SUBAREA RUNOFF(CFS) = 66.70
EFFECTIVE AREA(ACRES) = 50.80 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 50.80 PEAK FLOW RATE(CFS) = 177.54

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1008.00 TO NODE 1009.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3060.00 DOWNSTREAM(FEET) = 3040.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 409.00 CHANNEL SLOPE = 0.0489
CHANNEL BASE(FEET) = 4.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 4.00
CHANNEL FLOW THRU SUBAREA(CFS) = 177.54
FLOW VELOCITY(FEET/SEC.) = 9.07 FLOW DEPTH(FEET) = 2.86
TRAVEL TIME(MIN.) = 0.75 Tc(MIN.) = 17.71
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1009.00 = 2473.00 FEET.

*****
FLOW PROCESS FROM NODE 1008.00 TO NODE 1009.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
=====
MAINLINE Tc(MIN) = 17.71
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.013
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B 9.60 0.30 1.00 63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 22.90 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 32.50 SUBAREA RUNOFF(CFS) = 109.63
EFFECTIVE AREA(ACRES) = 83.30 AREA-AVERAGED Fm(INCH/HR) = 0.26
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 83.30 PEAK FLOW RATE(CFS) = 280.98

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1009.00 TO NODE 1010.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
=====
ELEVATION DATA: UPSTREAM(FEET) = 3040.00 DOWNSTREAM(FEET) = 3000.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1354.00 CHANNEL SLOPE = 0.0295
CHANNEL BASE(FEET) = 5.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 5.00
CHANNEL FLOW THRU SUBAREA(CFS) = 280.98
FLOW VELOCITY(FEET/SEC.) = 8.44 FLOW DEPTH(FEET) = 3.79
TRAVEL TIME(MIN.) = 2.67 Tc(MIN.) = 20.38
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1010.00 = 3827.00 FEET.

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*****
FLOW PROCESS FROM NODE 1009.00 TO NODE 1010.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 20.38
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.568
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B      22.50   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C      20.80   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.28
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 43.30   SUBAREA RUNOFF(CFS) = 128.27
EFFECTIVE AREA(ACRES) = 126.60   AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27   AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 126.60   PEAK FLOW RATE(CFS) = 375.88

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1010.00 TO NODE 1011.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3000.00 DOWNSTREAM(FEET) = 2960.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1293.00 CHANNEL SLOPE = 0.0309
CHANNEL BASE(FEET) = 5.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 5.00
CHANNEL FLOW THRU SUBAREA(CFS) = 375.88
FLOW VELOCITY(FEET/SEC.) = 9.24 FLOW DEPTH(FEET) = 4.35
TRAVEL TIME(MIN.) = 2.33 Tc(MIN.) = 22.72
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1011.00 = 5120.00 FEET.

*****
FLOW PROCESS FROM NODE 1010.00 TO NODE 1011.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 22.72
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.369
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B      24.80   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C      52.80   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 77.60   SUBAREA RUNOFF(CFS) = 216.73
EFFECTIVE AREA(ACRES) = 204.20   AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27   AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 204.20   PEAK FLOW RATE(CFS) = 570.01

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1011.00 TO NODE 1012.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<

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>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2960.00 DOWNSTREAM(FEET) = 2940.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 900.00 CHANNEL SLOPE = 0.0222
CHANNEL BASE(FEET) = 6.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 6.00
CHANNEL FLOW THRU SUBAREA(CFS) = 570.01
FLOW VELOCITY(FEET/SEC.) = 9.06 FLOW DEPTH(FEET) = 5.48
TRAVEL TIME(MIN.) = 1.66 Tc(MIN.) = 24.37
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1012.00 = 6020.00 FEET.

*****
FLOW PROCESS FROM NODE 1011.00 TO NODE 1012.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 24.37
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.228
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B      10.90   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C      15.10   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 26.00   SUBAREA RUNOFF(CFS) = 69.21
EFFECTIVE AREA(ACRES) = 230.20   AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27   AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 230.20   PEAK FLOW RATE(CFS) = 613.35

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1012.00 TO NODE 1013.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2940.00 DOWNSTREAM(FEET) = 2920.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 830.00 CHANNEL SLOPE = 0.0241
CHANNEL BASE(FEET) = 6.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 6.00
CHANNEL FLOW THRU SUBAREA(CFS) = 613.35
FLOW VELOCITY(FEET/SEC.) = 9.51 FLOW DEPTH(FEET) = 5.57
TRAVEL TIME(MIN.) = 1.45 Tc(MIN.) = 25.83
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1013.00 = 6850.00 FEET.

*****
FLOW PROCESS FROM NODE 1012.00 TO NODE 1013.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 25.83
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.105
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
LAND USE            GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B      3.20   0.30   1.00   63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C      21.50   0.25   1.00   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 24.70   SUBAREA RUNOFF(CFS) = 63.32
EFFECTIVE AREA(ACRES) = 254.90   AREA-AVERAGED Fm(INCH/HR) = 0.27

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AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 254.90 PEAK FLOW RATE(CFS) = 651.06

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1013.00 TO NODE 1014.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2920.00 DOWNSTREAM(FEET) = 2905.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 564.00 CHANNEL SLOPE = 0.0266
CHANNEL BASE(FEET) = 6.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 6.00
CHANNEL FLOW THRU SUBAREA(CFS) = 651.06
FLOW VELOCITY(FEET/SEC.) = 10.03 FLOW DEPTH(FEET) = 5.60
TRAVEL TIME(MIN.) = 0.94 Tc(MIN.) = 26.76
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1014.00 = 7414.00 FEET.

*****
FLOW PROCESS FROM NODE 1013.00 TO NODE 1014.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 26.76
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.025
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B 79.00 0.30 1.00 63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 2.90 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 81.90 SUBAREA RUNOFF(CFS) = 201.00
EFFECTIVE AREA(ACRES) = 336.80 AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 336.80 PEAK FLOW RATE(CFS) = 833.79

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1014.00 TO NODE 1015.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2905.00 DOWNSTREAM(FEET) = 2880.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 901.00 CHANNEL SLOPE = 0.0277
CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00
CHANNEL FLOW THRU SUBAREA(CFS) = 833.79
FLOW VELOCITY(FEET/SEC.) = 10.83 FLOW DEPTH(FEET) = 5.95
TRAVEL TIME(MIN.) = 1.39 Tc(MIN.) = 28.15
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1015.00 = 8315.00 FEET.

*****
FLOW PROCESS FROM NODE 1014.00 TO NODE 1015.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 28.15
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.907
SUBAREA LOSS RATE DATA(AMC II):

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DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B 1.80 0.30 1.00 63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 14.10 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 15.90 SUBAREA RUNOFF(CFS) = 37.94
EFFECTIVE AREA(ACRES) = 352.70 AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 352.70 PEAK FLOW RATE(CFS) = 835.99

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1015.00 TO NODE 1035.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 2880.00 DOWNSTREAM(FEET) = 2840.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 1895.00 CHANNEL SLOPE = 0.0211
CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00
CHANNEL FLOW THRU SUBAREA(CFS) = 835.99
FLOW VELOCITY(FEET/SEC.) = 9.79 FLOW DEPTH(FEET) = 6.38
TRAVEL TIME(MIN.) = 3.23 Tc(MIN.) = 31.38
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

*****
FLOW PROCESS FROM NODE 1015.00 TO NODE 1035.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 31.38
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.713
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" B 8.00 0.30 1.00 63
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 28.80 0.25 1.00 75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 36.80 SUBAREA RUNOFF(CFS) = 81.22
EFFECTIVE AREA(ACRES) = 389.50 AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 389.50 PEAK FLOW RATE(CFS) = 855.64

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 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.) = 31.38
RAINFALL INTENSITY(INCH/HR) = 2.71
AREA-AVERAGED Fm(INCH/HR) = 0.27
AREA-AVERAGED Fp(INCH/HR) = 0.27
AREA-AVERAGED Ap = 1.00
EFFECTIVE STREAM AREA(ACRES) = 389.50

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TOTAL STREAM AREA(ACRES) = 389.50  
PEAK FLOW RATE(CFS) AT CONFLUENCE = 855.64

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1020.00 TO NODE 1021.00 IS CODE = 21  
-----

>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<  
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<  
-----  
INITIAL SUBAREA FLOW-LENGTH(FEET) = 330.00  
ELEVATION DATA: UPSTREAM(FEET) = 3525.00 DOWNSTREAM(FEET) = 3485.00

Tc = K\*[(LENGTH\*\* 3.00)/(ELEVATION CHANGE)]\*\*0.20  
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.952  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.714  
SUBAREA Tc AND LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS Tc  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN (MIN.)  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 0.70 0.30 1.00 63 10.95  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.30 0.20 1.00 81 10.95  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA RUNOFF(CFS) = 4.90  
TOTAL AREA(ACRES) = 1.00 PEAK FLOW RATE(CFS) = 4.90

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1021.00 TO NODE 1022.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----  
ELEVATION DATA: UPSTREAM(FEET) = 3485.00 DOWNSTREAM(FEET) = 3440.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 191.00 CHANNEL SLOPE = 0.2356  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 4.90  
FLOW VELOCITY(FEET/SEC.) = 6.55 FLOW DEPTH(FEET) = 0.50  
TRAVEL TIME(MIN.) = 0.49 Tc(MIN.) = 11.44  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1022.00 = 521.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1021.00 TO NODE 1022.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
-----  
MAINLINE Tc(MIN) = 11.44  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.569  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 0.10 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.80 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 0.90 SUBAREA RUNOFF(CFS) = 4.34  
EFFECTIVE AREA(ACRES) = 1.90 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 1.90 PEAK FLOW RATE(CFS) = 9.11

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1022.00 TO NODE 1023.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----  
ELEVATION DATA: UPSTREAM(FEET) = 3440.00 DOWNSTREAM(FEET) = 3400.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 227.00 CHANNEL SLOPE = 0.1762  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9.11  
FLOW VELOCITY(FEET/SEC.) = 7.01 FLOW DEPTH(FEET) = 0.74  
TRAVEL TIME(MIN.) = 0.54 Tc(MIN.) = 11.98  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1023.00 = 748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1022.00 TO NODE 1023.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
-----  
MAINLINE Tc(MIN) = 11.98  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.407  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 1.20 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1.20 SUBAREA RUNOFF(CFS) = 5.62  
EFFECTIVE AREA(ACRES) = 3.10 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 3.10 PEAK FLOW RATE(CFS) = 14.45

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1023.00 TO NODE 1024.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
-----  
ELEVATION DATA: UPSTREAM(FEET) = 3400.00 DOWNSTREAM(FEET) = 3280.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 160.00 CHANNEL SLOPE = 0.7500  
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 14.45  
FLOW VELOCITY(FEET/SEC.) = 13.44 FLOW DEPTH(FEET) = 0.65  
TRAVEL TIME(MIN.) = 0.20 Tc(MIN.) = 12.18  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1024.00 = 908.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1023.00 TO NODE 1024.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
-----  
MAINLINE Tc(MIN) = 12.18  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.347  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 0.10 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.60 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21

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SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 0.70 SUBAREA RUNOFF(CFS) = 3.24
EFFECTIVE AREA(ACRES) = 3.80 AREA-AVERAGED Fm(INCH/HR) = 0.22
AREA-AVERAGED Fp(INCH/HR) = 0.22 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 3.80 PEAK FLOW RATE(CFS) = 17.53

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1024.00 TO NODE 1025.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3280.00 DOWNSTREAM(FEET) = 3240.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 138.00 CHANNEL SLOPE = 0.2899
CHANNEL BASE(FEET) = 1.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 1.00
CHANNEL FLOW THRU SUBAREA(CFS) = 17.53
FLOW VELOCITY(FEET/SEC.) = 9.95 FLOW DEPTH(FEET) = 0.92
TRAVEL TIME(MIN.) = 0.23 Tc(MIN.) = 12.41
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1025.00 = 1046.00 FEET.

*****
FLOW PROCESS FROM NODE 1024.00 TO NODE 1025.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 12.41
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.278
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 2.80 0.25 1.00 75
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" D 0.30 0.20 1.00 81
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 3.10 SUBAREA RUNOFF(CFS) = 14.04
EFFECTIVE AREA(ACRES) = 6.90 AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 6.90 PEAK FLOW RATE(CFS) = 31.33

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1025.00 TO NODE 1026.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3240.00 DOWNSTREAM(FEET) = 3200.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 200.00 CHANNEL SLOPE = 0.2000
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00
CHANNEL FLOW THRU SUBAREA(CFS) = 31.33
FLOW VELOCITY(FEET/SEC.) = 9.88 FLOW DEPTH(FEET) = 1.04
TRAVEL TIME(MIN.) = 0.34 Tc(MIN.) = 12.74
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1026.00 = 1246.00 FEET.

*****
FLOW PROCESS FROM NODE 1025.00 TO NODE 1026.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
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MAINLINE Tc(MIN) = 12.74
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 5.177
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 1.50 0.25 1.00 75
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" D 1.80 0.20 1.00 81
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 3.30 SUBAREA RUNOFF(CFS) = 14.71
EFFECTIVE AREA(ACRES) = 10.20 AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 10.20 PEAK FLOW RATE(CFS) = 45.42

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1026.00 TO NODE 1027.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3200.00 DOWNSTREAM(FEET) = 3120.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 477.00 CHANNEL SLOPE = 0.1677
CHANNEL BASE(FEET) = 2.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 2.00
CHANNEL FLOW THRU SUBAREA(CFS) = 45.42
FLOW VELOCITY(FEET/SEC.) = 10.23 FLOW DEPTH(FEET) = 1.33
TRAVEL TIME(MIN.) = 0.78 Tc(MIN.) = 13.52
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1027.00 = 1723.00 FEET.

*****
FLOW PROCESS FROM NODE 1026.00 TO NODE 1027.00 IS CODE = 81
-----
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<
-----
MAINLINE Tc(MIN) = 13.52
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.943
SUBAREA LOSS RATE DATA(AMC II):
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" C 3.90 0.25 1.00 75
NATURAL FAIR COVER
"CHAPARRAL,BROADLEAF" D 3.10 0.20 1.00 81
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 7.00 SUBAREA RUNOFF(CFS) = 29.71
EFFECTIVE AREA(ACRES) = 17.20 AREA-AVERAGED Fm(INCH/HR) = 0.23
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00
TOTAL AREA(ACRES) = 17.20 PEAK FLOW RATE(CFS) = 72.98

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

*****
FLOW PROCESS FROM NODE 1027.00 TO NODE 1028.00 IS CODE = 51
-----
>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<
-----
ELEVATION DATA: UPSTREAM(FEET) = 3120.00 DOWNSTREAM(FEET) = 3100.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 273.00 CHANNEL SLOPE = 0.0733
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00

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CHANNEL FLOW THRU SUBAREA(CFS) = 72.98  
FLOW VELOCITY(FEET/SEC.) = 8.41 FLOW DEPTH(FEET) = 1.81  
TRAVEL TIME(MIN.) = 0.54 Tc(MIN.) = 14.06  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1028.00 = 1996.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1027.00 TO NODE 1028.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 14.06  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.781  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 2.70 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.50 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 3.20 SUBAREA RUNOFF(CFS) = 13.07  
EFFECTIVE AREA(ACRES) = 20.40 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 20.40 PEAK FLOW RATE(CFS) = 83.54

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1028.00 TO NODE 1029.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3100.00 DOWNSTREAM(FEET) = 3080.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 212.00 CHANNEL SLOPE = 0.0943  
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 83.54  
FLOW VELOCITY(FEET/SEC.) = 9.57 FLOW DEPTH(FEET) = 1.81  
TRAVEL TIME(MIN.) = 0.37 Tc(MIN.) = 14.43  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1029.00 = 2208.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1028.00 TO NODE 1029.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 14.43  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.670  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 4.60 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 4.40 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 8.70 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 17.70 SUBAREA RUNOFF(CFS) = 70.60  
EFFECTIVE AREA(ACRES) = 38.10 AREA-AVERAGED Fm(INCH/HR) = 0.23  
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 38.10 PEAK FLOW RATE(CFS) = 152.11

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1029.00 TO NODE 1030.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3080.00 DOWNSTREAM(FEET) = 3000.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 781.00 CHANNEL SLOPE = 0.1024  
CHANNEL BASE(FEET) = 3.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 3.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 152.11  
FLOW VELOCITY(FEET/SEC.) = 11.54 FLOW DEPTH(FEET) = 2.43  
TRAVEL TIME(MIN.) = 1.13 Tc(MIN.) = 15.56  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1030.00 = 2989.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1029.00 TO NODE 1030.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 15.56  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.399  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 24.90 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 6.60 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 31.50 SUBAREA RUNOFF(CFS) = 117.93  
EFFECTIVE AREA(ACRES) = 69.60 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 69.60 PEAK FLOW RATE(CFS) = 260.74

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1030.00 TO NODE 1031.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM(FEET) = 3000.00 DOWNSTREAM(FEET) = 2980.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 392.00 CHANNEL SLOPE = 0.0510  
CHANNEL BASE(FEET) = 4.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 4.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 260.74  
FLOW VELOCITY(FEET/SEC.) = 10.17 FLOW DEPTH(FEET) = 3.44  
TRAVEL TIME(MIN.) = 0.64 Tc(MIN.) = 16.20  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1031.00 = 3381.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1030.00 TO NODE 1031.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 16.20  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.284  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 53.50 0.25 1.00 75

NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 2.40 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 55.90 SUBAREA RUNOFF(CFS) = 203.04  
EFFECTIVE AREA(ACRES) = 125.50 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 125.50 PEAK FLOW RATE(CFS) = 456.53

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1031.00 TO NODE 1032.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM( FEET) = 2980.00 DOWNSTREAM( FEET) = 2920.00  
CHANNEL LENGTH THRU SUBAREA( FEET) = 1552.00 CHANNEL SLOPE = 0.0387  
CHANNEL BASE( FEET) = 5.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH( FEET) = 5.00  
CHANNEL FLOW THRU SUBAREA( CFS) = 456.53  
FLOW VELOCITY( FEET/SEC.) = 10.55 FLOW DEPTH( FEET) = 4.54  
TRAVEL TIME( MIN.) = 2.45 Tc( MIN.) = 18.65  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1032.00 = 4933.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1031.00 TO NODE 1032.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc( MIN) = 18.65  
\* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 3.842  
SUBAREA LOSS RATE DATA( AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 65.60 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 44.00 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 109.60 SUBAREA RUNOFF(CFS) = 356.33  
EFFECTIVE AREA(ACRES) = 235.10 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 235.10 PEAK FLOW RATE(CFS) = 763.02

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1032.00 TO NODE 1033.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM( FEET) = 2920.00 DOWNSTREAM( FEET) = 2900.00  
CHANNEL LENGTH THRU SUBAREA( FEET) = 976.00 CHANNEL SLOPE = 0.0205  
CHANNEL BASE( FEET) = 7.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH( FEET) = 7.00  
CHANNEL FLOW THRU SUBAREA( CFS) = 763.02  
FLOW VELOCITY( FEET/SEC.) = 9.45 FLOW DEPTH( FEET) = 6.14  
TRAVEL TIME( MIN.) = 1.72 Tc( MIN.) = 20.38  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1033.00 = 5909.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1032.00 TO NODE 1033.00 IS CODE = 81  
-----

-----  
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc( MIN) = 20.38  
\* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 3.568  
SUBAREA LOSS RATE DATA( AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 35.60 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 0.60 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 36.20 SUBAREA RUNOFF(CFS) = 108.13  
EFFECTIVE AREA(ACRES) = 271.30 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 271.30 PEAK FLOW RATE(CFS) = 813.12

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1033.00 TO NODE 1034.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM( FEET) = 2900.00 DOWNSTREAM( FEET) = 2880.00  
CHANNEL LENGTH THRU SUBAREA( FEET) = 942.00 CHANNEL SLOPE = 0.0212  
CHANNEL BASE( FEET) = 7.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH( FEET) = 7.00  
CHANNEL FLOW THRU SUBAREA( CFS) = 813.12  
FLOW VELOCITY( FEET/SEC.) = 9.74 FLOW DEPTH( FEET) = 6.28  
TRAVEL TIME( MIN.) = 1.61 Tc( MIN.) = 21.99  
LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1034.00 = 6851.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1033.00 TO NODE 1034.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc( MIN) = 21.99  
\* 100 YEAR RAINFALL INTENSITY( INCH/HR) = 3.431  
SUBAREA LOSS RATE DATA( AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 30.50 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 1.20 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 31.70 SUBAREA RUNOFF(CFS) = 90.81  
EFFECTIVE AREA(ACRES) = 303.00 AREA-AVERAGED Fm(INCH/HR) = 0.24  
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
TOTAL AREA(ACRES) = 303.00 PEAK FLOW RATE(CFS) = 870.48

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1034.00 TO NODE 1035.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

-----  
ELEVATION DATA: UPSTREAM( FEET) = 2880.00 DOWNSTREAM( FEET) = 2840.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 1097.00 CHANNEL SLOPE = 0.0365  
 CHANNEL BASE(FEET) = 7.00 "Z" FACTOR = 1.000  
 MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 7.00  
 CHANNEL FLOW THRU SUBAREA(CFS) = 870.48  
 FLOW VELOCITY(FEET/SEC.) = 12.11 FLOW DEPTH(FEET) = 5.67  
 TRAVEL TIME(MIN.) = 1.51 Tc(MIN.) = 23.50  
 LONGEST FLOWPATH FROM NODE 1020.00 TO NODE 1035.00 = 7948.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1034.00 TO NODE 1035.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 23.50  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 3.303  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	1.20	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	113.90	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	18.60	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 133.70 SUBAREA RUNOFF(CFS) = 368.12  
 EFFECTIVE AREA(ACRES) = 436.70 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 436.70 PEAK FLOW RATE(CFS) = 1203.62

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 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.) = 23.50  
 RAINFALL INTENSITY(INCH/HR) = 3.30  
 AREA-AVERAGED Fm(INCH/HR) = 0.24  
 AREA-AVERAGED Fp(INCH/HR) = 0.24  
 AREA-AVERAGED Ap = 1.00  
 EFFECTIVE STREAM AREA(ACRES) = 436.70  
 TOTAL STREAM AREA(ACRES) = 436.70  
 PEAK FLOW RATE(CFS) AT CONFLUENCE = 1203.62

\*\* CONFLUENCE DATA \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	855.64	31.38	2.713	0.27( 0.27)	1.00	389.5	1000.00
2	1203.62	23.50	3.303	0.24( 0.24)	1.00	436.7	1020.00

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

\*\* PEAK FLOW RATE TABLE \*\*

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap (ACRES)	Ae (ACRES)	HEADWATER NODE
1	1999.11	23.50	3.303	0.25( 0.25)	1.00	728.4	1020.00
2	1827.57	31.38	2.713	0.26( 0.26)	1.00	826.2	1000.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:  
 PEAK FLOW RATE(CFS) = 1999.11 Tc(MIN.) = 23.50

EFFECTIVE AREA(ACRES) = 728.38 AREA-AVERAGED Fm(INCH/HR) = 0.25  
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 1.00  
 TOTAL AREA(ACRES) = 826.20  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 7  
 -----

>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<<<<<  
 >>>>USING TIME-OF-CONCENTRATION OF LONGEST FLOWPATH<<<<<

=====

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.78;30M= 1.34;1H= 1.94;3H= 3.96;6H= 6.19;24H=11.27  
 S-GRAPH: VALLEY(DEV.)= 0.0%;VALLEY(UNDEV.)/DESERT= 5.0%  
 MOUNTAIN= 92.0%;FOOTHILL= 3.0%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 0.52; LAG(HR) = 0.42; Fm(INCH/HR) = 0.26; Ybar = 0.31  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;  
 3HR = 0.99; 6HR = 1.00; 24HR = 1.00  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 826.20  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0453; Lca/L=0.4,n=.0406; Lca/L=0.5,n=.0373;Lca/L=0.6,n=.0348  
 TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 565.80  
 UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) = 1769.41  
 TOTAL PEAK FLOW RATE(CFS) = 1769.41 (SOURCE FLOW INCLUDED)  
 RATIONAL METHOD PEAK FLOW RATE(CFS) = 1999.11  
 (UPSTREAM NODE PEAK FLOW RATE(CFS) = 1999.11)  
 PEAK FLOW RATE(CFS) USED = 1999.11

=====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 826.20 TC(MIN.) = 31.38  
 AREA-AVERAGED Fm(INCH/HR)= 0.26 Ybar = 0.31  
 PEAK FLOW RATE(CFS) = 1999.11  
 -----

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LU36100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--  
  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.170  
FOOTHILL 0.030  
MOUNTAIN 0.750  
VALLEY(UNDEVELOPED)/DESERT 0.050  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU35100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1999.11 Tc(MIN.) = 31.38  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.31  
TOTAL AREA(ACRES) = 826.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1999.11 Tc(MIN.) = 31.38  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.31  
TOTAL AREA(ACRES) = 826.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1035.00 = 10210.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1035.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1036.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2840.00 DOWNSTREAM(FEET) = 2800.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1878.00 CHANNEL SLOPE = 0.0213  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1999.11  
FLOW VELOCITY(FEET/SEC.) = 14.40 FLOW DEPTH(FEET) = 7.80  
TRAVEL TIME(MIN.) = 2.17 Tc(MIN.) = 33.55  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1036.00 = 12088.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1035.00 TO NODE 1036.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 33.55  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.079  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 31.30 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 21.90 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.28  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 53.20  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.78;30M= 1.34;1H= 1.94;3H= 3.96;6H= 6.19;24H=11.27  
S-GRAPH: VALLEY(DEV.)= 0.0%;VALLEY(UNDEV.)/DESERT= 5.0%  
MOUNTAIN= 91.0%;FOOTHILL= 3.0%;DESERT(UNDEV.)= 1.0%  
Tc(HR) = 0.56; LAG(HR) = 0.45; Fm(INCH/HR) = 0.26; Ybar = 0.31  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;  
3HR = 0.99; 6HR = 1.00; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 879.40

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1036.00 = 12088.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0421; Lca/L=0.4,n=.0377; Lca/L=0.5,n=.0346;Lca/L=0.6,n=.0323  
TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 599.81  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1822.73  
TOTAL AREA(ACRES) = 879.40 PEAK FLOW RATE(CFS) = 1999.11  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 879.40 TC(MIN.) = 33.55  
AREA-AVERAGED Fm(INCH/HR)= 0.26 Ybar = 0.31  
PEAK FLOW RATE(CFS) = 1999.11

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU37100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.130  
MOUNTAIN 0.710  
VALLEY(UNDEVELOPED)/DESERT 0.150  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1036.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU36100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1999.11 Tc(MIN.) = 33.55  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.31  
TOTAL AREA(ACRES) = 879.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1036.00 = 12088.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1036.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1999.11 Tc(MIN.) = 33.55  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.31  
TOTAL AREA(ACRES) = 879.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1036.00 = 12088.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1036.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1037.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2800.00 DOWNSTREAM(FEET) = 2760.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1959.00 CHANNEL SLOPE = 0.0204  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1999.11  
FLOW VELOCITY(FEET/SEC.) = 14.18 FLOW DEPTH(FEET) = 7.88  
TRAVEL TIME(MIN.) = 2.30 Tc(MIN.) = 35.85  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1037.00 = 14047.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1036.00 TO NODE 1037.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 35.85  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 2.001  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 40.40 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 56.40 0.25 1.00 75  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 96.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.78;30M= 1.34;1H= 1.94;3H= 3.96;6H= 6.19;24H=11.27  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.26; Ybar = 0.32  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.96; 30M = 0.96; 1HR = 0.96;  
3HR = 0.99; 6HR = 1.00; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 976.20

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1037.00 = 14047.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0397; Lca/L=0.4,n=.0356; Lca/L=0.5,n=.0327;Lca/L=0.6,n=.0305  
TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 663.34  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 1910.21  
TOTAL AREA(ACRES) = 976.20 PEAK FLOW RATE(CFS) = 1999.11  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 976.20 TC(MIN.) = 35.85  
AREA-AVERAGED Fm(INCH/HR)= 0.26 Ybar = 0.32  
PEAK FLOW RATE(CFS) = 1999.11

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU38100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1037.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU37100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1999.11 Tc(MIN.) = 35.85  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.32  
TOTAL AREA(ACRES) = 976.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1037.00 = 14047.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1037.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 1999.11 Tc(MIN.) = 35.85  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.32  
TOTAL AREA(ACRES) = 976.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1037.00 = 14047.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1037.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1038.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2760.00 DOWNSTREAM(FEET) = 2700.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2116.00 CHANNEL SLOPE = 0.0284  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 1999.11  
FLOW VELOCITY(FEET/SEC.) = 16.01 FLOW DEPTH(FEET) = 7.24  
TRAVEL TIME(MIN.) = 2.20 Tc(MIN.) = 38.06  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1038.00 = 16163.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1037.00 TO NODE 1038.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 38.06  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.934  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 17.10 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 137.10 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 11.50 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 165.70  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.78;30M= 1.34;1H= 1.94;3H= 3.96;6H= 6.19;24H=11.27  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.63; LAG(HR) = 0.51; Fm(INCH/HR) = 0.26; Ybar = 0.31  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.95; 30M = 0.95; 1HR = 0.95;

3HR = 0.99; 6HR = 1.00; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1141.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1038.00 = 16163.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0377; Lca/L=0.4,n=.0338; Lca/L=0.5,n=.0311;Lca/L=0.6,n=.0290  
TIME OF PEAK FLOW(HR) = 16.33 RUNOFF VOLUME(AF) = 777.92  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2111.29  
TOTAL AREA(ACRES) = 1141.90 PEAK FLOW RATE(CFS) = 2111.29

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1141.90 TC(MIN.) = 38.06  
AREA-AVERAGED Fm(INCH/HR)= 0.26 Ybar = 0.31  
PEAK FLOW RATE(CFS) = 2111.29

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU39100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1938.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE	TABLE FILE NAME	Tc(MIN.)
2111.29	LU38100H.DNA	38.06

MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2111.29 Tc(MIN.) = 38.06  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.31  
TOTAL AREA(ACRES) = 1141.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1938.00 = 16163.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1038.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2111.29 Tc(MIN.) = 38.06  
AREA-AVERAGED Fm(INCH/HR) = 0.26 Ybar = 0.31  
TOTAL AREA(ACRES) = 1141.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1038.00 = 16163.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1038.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1039.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2700.00 DOWNSTREAM(FEET) = 2600.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2298.00 CHANNEL SLOPE = 0.0435  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 2111.29  
FLOW VELOCITY(FEET/SEC.) = 19.04 FLOW DEPTH(FEET) = 6.66  
TRAVEL TIME(MIN.) = 2.01 Tc(MIN.) = 40.07  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1039.00 = 18461.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1038.00 TO NODE 1039.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 40.07  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.878  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	3.20	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	10.50	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	88.80	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 102.50  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.78;30M= 1.34;1H= 1.94;3H= 3.96;6H= 6.19;24H=11.27  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.67; LAG(HR) = 0.53; Fm(INCH/HR) = 0.25; Ybar = 0.31  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94;

3HR = 0.99; 6HR = 1.00; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1244.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1039.00 = 18461.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0362; Lca/L=0.4,n=.0325; Lca/L=0.5,n=.0298;Lca/L=0.6,n=.0278  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 854.07  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2251.23  
TOTAL AREA(ACRES) = 1244.40 PEAK FLOW RATE(CFS) = 2251.23

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

=====  
END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 1244.40 TC(MIN.) = 40.07  
AREA-AVERAGED Fm(INCH/HR)= 0.25 Ybar = 0.31  
PEAK FLOW RATE(CFS) = 2251.23

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU40100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1039.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOW RATE(CFS)	Tc(MIN.)
2251.23	40.07

AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.31  
TOTAL AREA(ACRES) = 1244.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1039.00 = 18461.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1039.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2251.23 Tc(MIN.) = 40.07  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.31  
TOTAL AREA(ACRES) = 1244.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1039.00 = 18461.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1039.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1040.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2600.00 DOWNSTREAM(FEET) = 2400.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3287.00 CHANNEL SLOPE = 0.0608  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 2251.23  
FLOW VELOCITY(FEET/SEC.) = 21.90 FLOW DEPTH(FEET) = 6.30  
TRAVEL TIME(MIN.) = 2.50 Tc(MIN.) = 42.57  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1040.00 = 21748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1039.00 TO NODE 1040.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 42.57  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.814  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 115.00 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 115.00  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.78;30M= 1.34;1H= 1.94;3H= 3.96;6H= 6.19;24H=11.27  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.71; LAG(HR) = 0.57; Fm(INCH/HR) = 0.25; Ybar = 0.30  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.94; 30M = 0.94; 1HR = 0.94;  
3HR = 0.99; 6HR = 1.00; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1359.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1040.00 = 21748.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0348; Lca/L=0.4,n=.0312; Lca/L=0.5,n=.0286;Lca/L=0.6,n=.0267  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 940.71  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2428.98  
TOTAL AREA(ACRES) = 1359.40 PEAK FLOW RATE(CFS) = 2428.98

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1359.40 TC(MIN.) = 42.57  
AREA-AVERAGED Fm(INCH/HR)= 0.25 Ybar = 0.30  
PEAK FLOW RATE(CFS) = 2428.98

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU41100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1040.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU40100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2428.98 Tc(MIN.) = 42.57  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.30  
TOTAL AREA(ACRES) = 1359.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1040.00 = 21748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1040.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2428.98 Tc(MIN.) = 42.57  
AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.30  
TOTAL AREA(ACRES) = 1359.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1040.00 = 21748.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1040.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1041.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2400.00 DOWNSTREAM(FEET) = 2200.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2212.00 CHANNEL SLOPE = 0.0904  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 2428.98  
FLOW VELOCITY(FEET/SEC.) = 21.94 FLOW DEPTH(FEET) = 6.65  
TRAVEL TIME(MIN.) = 1.68 Tc(MIN.) = 44.25  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1041.00 = 23960.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1040.00 TO NODE 1041.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 44.25  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.774  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 61.20 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 156.90 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 218.10  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.78;30M= 1.34;1H= 1.94;3H= 3.96;6H= 6.19;24H=11.27  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.74; LAG(HR) = 0.59; Fm(INCH/HR) = 0.24; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.93; 30M = 0.93; 1HR = 0.93;  
3HR = 0.99; 6HR = 0.99; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1577.50

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1041.00 = 23960.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0344; Lca/L=0.4,n=.0308; Lca/L=0.5,n=.0283;Lca/L=0.6,n=.0264  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 1101.46  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 2751.02  
TOTAL AREA(ACRES) = 1577.50 PEAK FLOW RATE(CFS) = 2751.02

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1577.50 TC(MIN.) = 44.25  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.29  
PEAK FLOW RATE(CFS) = 2751.02

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU42100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	10.000
2)	10.000;	6.000
3)	15.000;	4.500
4)	20.000;	3.600
5)	30.000;	2.750
6)	60.000;	1.950
7)	120.000;	1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)

VALLEY(DEVELOPED)	0.010
FOOTHILL	0.040
MOUNTAIN	0.890
VALLEY(UNDEVELOPED)/DESERT	0.060
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1041.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU41100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2751.02 Tc(MIN.) = 44.25  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.29  
TOTAL AREA(ACRES) = 1577.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1041.00 = 23960.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1041.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 2751.02 Tc(MIN.) = 44.25  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.29  
TOTAL AREA(ACRES) = 1577.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1041.00 = 23960.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1041.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1042.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2200.00 DOWNSTREAM(FEET) = 2000.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1708.00 CHANNEL SLOPE = 0.1171  
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 2751.02  
FLOW VELOCITY(FEET/SEC.) = 24.93 FLOW DEPTH(FEET) = 6.63  
TRAVEL TIME(MIN.) = 1.14 Tc(MIN.) = 45.39  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1042.00 = 25668.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1041.00 TO NODE 1042.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 45.39  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.748  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	169.60	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	24.80	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 194.40  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.78;30M= 1.34;1H= 1.94;3H= 3.96;6H= 6.19;24H=11.27  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.76; LAG(HR) = 0.61; Fm(INCH/HR) = 0.24; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.92; 30M = 0.92; 1HR = 0.92;  
3HR = 0.99; 6HR = 0.99; 24HR = 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1771.90

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1042.00 = 25668.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0342; Lca/L=0.4,n=.0306; Lca/L=0.5,n=.0281;Lca/L=0.6,n=.0263  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 1238.13  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 3014.59  
TOTAL AREA(ACRES) = 1771.90 PEAK FLOW RATE(CFS) = 3014.59

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.78; 30M = 1.34; 1HR = 1.94; 3HR = 3.96; 6HR = 6.19; 24HR =11.27

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1771.90 TC(MIN.) = 45.39  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.29  
PEAK FLOW RATE(CFS) = 3014.59

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU43100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1042.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME:	LU42100H.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:	
PEAK FLOW RATE(CFS) =	3014.59 Tc(MIN.) = 45.39
AREA-AVERAGED Fm(INCH/HR) =	0.24 Ybar = 0.29
TOTAL AREA(ACRES) =	1771.90
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE 1042.00 = 25668.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1042.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3014.59 Tc(MIN.) = 45.39  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.29  
TOTAL AREA(ACRES) = 1771.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1042.00 = 25668.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1042.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1043.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 2000.00 DOWNSTREAM(FEET) = 1990.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1322.00 CHANNEL SLOPE = 0.0076  
CHANNEL BASE(FEET) = 20.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 3014.59  
FLOW VELOCITY(FEET/SEC.) = 10.68 FLOW DEPTH(FEET) = 9.55  
TRAVEL TIME(MIN.) = 2.06 Tc(MIN.) = 47.46  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1043.00 = 26990.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1042.00 TO NODE 1043.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 47.46  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.704  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	A	7.40	0.40	1.00	40
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	42.50	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	106.00	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 155.90  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.78;30M= 1.34;1H= 1.94;3H= 3.96;6H= 6.18;24H=11.25  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.79; LAG(HR) = 0.63; Fm(INCH/HR) = 0.24; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.91; 30M = 0.91; 1HR = 0.91;

3HR = 0.99; 6HR = 0.99; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 1927.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1043.00 = 26990.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0341; Lca/L=0.4,n=.0306; Lca/L=0.5,n=.0281;Lca/L=0.6,n=.0262  
TIME OF PEAK FLOW(HR) = 16.42 RUNOFF VOLUME(AF) = 1347.82  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 3151.16  
TOTAL AREA(ACRES) = 1927.80 PEAK FLOW RATE(CFS) = 3151.16

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.77; 30M = 1.33; 1HR = 1.92; 3HR = 3.91; 6HR = 6.09; 24HR =11.08

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 1927.80 TC(MIN.) = 47.46  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.29  
PEAK FLOW RATE(CFS) = 3151.16

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU44100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1043.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU43100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3151.16 Tc(MIN.) = 47.46  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.29  
TOTAL AREA(ACRES) = 1927.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1043.00 = 26990.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1043.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3151.16 Tc(MIN.) = 47.46  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.29  
TOTAL AREA(ACRES) = 1927.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1043.00 = 26990.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1043.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1044.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1990.00 DOWNSTREAM(FEET) = 1980.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1681.00 CHANNEL SLOPE = 0.0059  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 3151.16  
FLOW VELOCITY(FEET/SEC.) = 9.74 FLOW DEPTH(FEET) = 9.40  
TRAVEL TIME(MIN.) = 2.88 Tc(MIN.) = 50.33  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1044.00 = 28671.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1043.00 TO NODE 1044.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 50.33  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.648  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 2.20 0.40 1.00 40  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 27.60 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 59.80 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 89.60  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.78;30M= 1.34;1H= 1.94;3H= 3.95;6H= 6.17;24H=11.23  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.84; LAG(HR) = 0.67; Fm(INCH/HR) = 0.24; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.91; 30M = 0.91; 1HR = 0.91;

3HR = 0.99; 6HR = 0.99; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2017.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1044.00 = 28671.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0342; Lca/L=0.4,n=.0307; Lca/L=0.5,n=.0282;Lca/L=0.6,n=.0263  
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 1409.10  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 3158.29  
TOTAL AREA(ACRES) = 2017.40 PEAK FLOW RATE(CFS) = 3158.29

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.76; 30M = 1.32; 1HR = 1.90; 3HR = 3.82; 6HR = 5.93; 24HR =10.75

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 2017.40 TC(MIN.) = 50.33  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.29  
PEAK FLOW RATE(CFS) = 3158.29

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU45100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1044.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE	TABLE FILE NAME	Tc(MIN.)
3158.29	LU44100H.DNA	50.33

MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3158.29 Tc(MIN.) = 50.33  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.29  
TOTAL AREA(ACRES) = 2017.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1044.00 = 28671.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1044.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3158.29 Tc(MIN.) = 50.33  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.29  
TOTAL AREA(ACRES) = 2017.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1044.00 = 28671.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1044.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1045.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1980.00 DOWNSTREAM(FEET) = 1960.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2360.00 CHANNEL SLOPE = 0.0085  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 3158.29  
FLOW VELOCITY(FEET/SEC.) = 11.06 FLOW DEPTH(FEET) = 8.52  
TRAVEL TIME(MIN.) = 3.56 Tc(MIN.) = 53.89  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1045.00 = 31031.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1044.00 TO NODE 1045.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 53.89  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.584  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	40.90	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	179.40	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	97.70	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 318.00  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.77;30M= 1.33;1H= 1.93;3H= 3.92;6H= 6.12;24H=11.12  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.90; LAG(HR) = 0.72; Fm(INCH/HR) = 0.24; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.90; 30M = 0.90; 1HR = 0.90;

3HR = 0.98; 6HR = 0.99; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2335.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1045.00 = 31031.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0341; Lca/L=0.4,n=.0306; Lca/L=0.5,n=.0281;Lca/L=0.6,n=.0262  
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 1610.46  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 3548.03  
TOTAL AREA(ACRES) = 2335.40 PEAK FLOW RATE(CFS) = 3548.03

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.74; 30M = 1.30; 1HR = 1.87; 3HR = 3.74; 6HR = 5.77; 24HR =10.44

=====  
END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 2335.40 TC(MIN.) = 53.89  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.29  
PEAK FLOW RATE(CFS) = 3548.03

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU46100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.040  
MOUNTAIN 0.890  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1045.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE	TABLE FILE NAME	Tc(MIN.)
3548.03	LU45100H.DNA	53.89

MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3548.03 Tc(MIN.) = 53.89  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.29  
TOTAL AREA(ACRES) = 2335.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1045.00 = 31031.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1045.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3548.03 Tc(MIN.) = 53.89  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.29  
TOTAL AREA(ACRES) = 2335.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1045.00 = 31031.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1045.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1046.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1960.00 DOWNSTREAM(FEET) = 1915.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2743.00 CHANNEL SLOPE = 0.0164  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 3548.03  
FLOW VELOCITY(FEET/SEC.) = 14.46 FLOW DEPTH(FEET) = 7.54  
TRAVEL TIME(MIN.) = 3.16 Tc(MIN.) = 57.05  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1046.00 = 33774.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1045.00 TO NODE 1046.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 57.05  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.533  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	30.70	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	79.90	0.25	1.00	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 110.60  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.77;30M= 1.33;1H= 1.92;3H= 3.89;6H= 6.06;24H=11.01  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.95; LAG(HR) = 0.76; Fm(INCH/HR) = 0.24; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.89; 30M = 0.89; 1HR = 0.89;  
3HR = 0.98; 6HR = 0.99; 24HR= 1.00  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 2446.00

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1046.00 = 33774.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 1661.34  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 3548.59  
TOTAL AREA(ACRES) = 2446.00 PEAK FLOW RATE(CFS) = 3548.59

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.66; 30M = 1.22; 1HR = 1.71; 3HR = 3.25; 6HR = 4.87; 24HR = 8.64

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 2446.00 TC(MIN.) = 57.05

AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.29

PEAK FLOW RATE(CFS) = 3548.59  
=====

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU47100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	10.000
2)	10.000;	6.000
3)	15.000;	4.500
4)	20.000;	3.600
5)	30.000;	2.750
6)	60.000;	1.950
7)	120.000;	1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.040
MOUNTAIN	0.890
VALLEY(UNDEVELOPED)/DESERT	0.060
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1046.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU46100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3548.59 Tc(MIN.) = 57.05  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.29  
TOTAL AREA(ACRES) = 2446.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1046.00 = 33774.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1046.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 3548.59 Tc(MIN.) = 57.05  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.29  
TOTAL AREA(ACRES) = 2446.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1046.00 = 33774.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1046.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1047.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1915.00 DOWNSTREAM(FEET) = 1910.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 221.00 CHANNEL SLOPE = 0.0226  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 3548.59  
FLOW VELOCITY(FEET/SEC.) = 16.19 FLOW DEPTH(FEET) = 6.88  
TRAVEL TIME(MIN.) = 0.23 Tc(MIN.) = 57.28  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1047.00 = 33995.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1046.00 TO NODE 1047.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 57.28  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.530  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	B	146.30	0.30	1.00	63
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	1591.10	0.25	1.00	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	118.40	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1855.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.77;30M= 1.33;1H= 1.92;3H= 3.91;6H= 6.09;24H=11.07  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
MOUNTAIN= 89.0%;FOOTHILL= 4.0%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 0.95; LAG(HR) = 0.76; Fm(INCH/HR) = 0.25; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.81; 30M = 0.81; 1HR = 0.81;

3HR = 0.97; 6HR = 0.99; 24HR= 0.99  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4301.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1047.00 = 33995.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257  
TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 2913.83  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5750.24  
TOTAL AREA(ACRES) = 4301.80 PEAK FLOW RATE(CFS) = 5750.24

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.77; 30M = 1.33; 1HR = 1.93; 3HR = 3.93; 6HR = 6.13; 24HR =11.15

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 4301.80 TC(MIN.) = 57.28  
AREA-AVERAGED Fm(INCH/HR)= 0.25 Ybar = 0.29  
PEAK FLOW RATE(CFS) = 5750.24

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU48100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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

\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 10.000
- 2) 10.000; 6.000
- 3) 15.000; 4.500
- 4) 20.000; 3.600
- 5) 30.000; 2.750
- 6) 60.000; 1.950
- 7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / PARK- SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.070
MOUNTAIN	0.860
VALLEY(UNDEVELOPED)/DESERT	0.060
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1047.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU47100H.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5750.24 Tc(MIN.) = 57.28

AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.29

TOTAL AREA(ACRES) = 4301.80

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1047.00 = 33995.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1047.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 5750.24 Tc(MIN.) = 57.28

AREA-AVERAGED Fm(INCH/HR) = 0.25 Ybar = 0.29

TOTAL AREA(ACRES) = 4301.80

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1047.00 = 33995.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1047.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1048.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1910.00 DOWNSTREAM(FEET) = 1750.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 1601.00 CHANNEL SLOPE = 0.0999  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 10.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 5750.24  
FLOW VELOCITY(FEET/SEC.) = 26.92 FLOW DEPTH(FEET) = 6.73  
TRAVEL TIME(MIN.) = 0.99 Tc(MIN.) = 58.27  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1047.00 TO NODE 1048.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 58.27  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.515  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	3.60	0.40	1.00	40
NATURAL FAIR COVER					
"WOODLAND"	A	3.30	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	59.50	0.30	1.00	63
NATURAL POOR COVER					
"BARREN"	B	0.40	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	0.10	0.30	1.00	69
NATURAL FAIR COVER					
"WOODLAND"	B	16.70	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 83.60  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.77;30M= 1.33;1H= 1.92;3H= 3.91;6H= 6.09;24H=11.07  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
 MOUNTAIN= 88.9%;FOOTHILL= 4.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 0.97; LAG(HR) = 0.78; Fm(INCH/HR) = 0.25; Ybar = 0.30  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.80; 30M = 0.80; 1HR = 0.80;  
 3HR = 0.97; 6HR = 0.99; 24HR= 0.99  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 4385.40  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0333; Lca/L=0.4,n=.0299; Lca/L=0.5,n=.0274;Lca/L=0.6,n=.0256  
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 2959.96  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 5752.67  
 TOTAL AREA(ACRES) = 4385.40 PEAK FLOW RATE(CFS) = 5752.67

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.78; 30M = 1.34; 1HR = 1.93; 3HR = 3.94; 6HR = 6.14; 24HR =11.18

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1047.00 TO NODE 1048.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 58.27

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.996  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	926.70	0.25	1.00	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	0.50	0.25	0.50	69
NATURAL POOR COVER					
"BARREN"	C	10.50	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	10.70	0.25	1.00	79
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	299.20	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	40.40	0.25	1.00	73

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1288.00  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.77;30M= 1.33;1H= 1.92;3H= 3.92;6H= 6.10;24H=11.10  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
 MOUNTAIN= 88.3%;FOOTHILL= 4.7%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 0.97; LAG(HR) = 0.78; Fm(INCH/HR) = 0.25; Ybar = 0.29  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.77; 30M = 0.77; 1HR = 0.77;  
 3HR = 0.96; 6HR = 0.98; 24HR= 0.99  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 5673.40  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0333; Lca/L=0.4,n=.0299; Lca/L=0.5,n=.0274;Lca/L=0.6,n=.0256  
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 3844.51  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 7185.64  
 TOTAL AREA(ACRES) = 5673.40 PEAK FLOW RATE(CFS) = 7185.64

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.78; 30M = 1.34; 1HR = 1.93; 3HR = 3.94; 6HR = 6.14; 24HR =11.18

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1047.00 TO NODE 1048.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 58.27

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.996  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	805.90	0.20	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	D	51.50	0.20	1.00	79
NATURAL POOR COVER					
"BARREN"	D	2.40	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	3.10	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	23.30	0.20	1.00	83
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	567.30	0.20	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1453.50  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.77;30M= 1.33;1H= 1.93;3H= 3.92;6H= 6.11;24H=11.11  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.0%  
 MOUNTAIN= 87.8%;FOOTHILL= 5.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 0.97; LAG(HR) = 0.78; Fm(INCH/HR) = 0.24; Ybar = 0.27  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.73; 30M = 0.73; 1HR = 0.73;  
 3HR = 0.96; 6HR = 0.98; 24HR= 0.99  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 7126.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0333; Lca/L=0.4,n=.0299; Lca/L=0.5,n=.0274;Lca/L=0.6,n=.0256  
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 4922.31  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8755.24  
 TOTAL AREA(ACRES) = 7126.90 PEAK FLOW RATE(CFS) = 8755.24

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.78; 30M = 1.34; 1HR = 1.93; 3HR = 3.94; 6HR = 6.14; 24HR =11.18

\*\*\*\*\*  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 7126.90 TC(MIN.) = 58.27  
 AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.27  
 PEAK FLOW RATE(CFS) = 8755.24

\*\*\*\*\*  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU49100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.050  
MOUNTAIN 0.800  
VALLEY(UNDEVELOPED)/DESERT 0.140  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1048.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU48100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 8755.24 Tc(MIN.) = 58.27  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.27  
TOTAL AREA(ACRES) = 7126.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1048.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 8755.24 Tc(MIN.) = 58.27  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.27  
TOTAL AREA(ACRES) = 7126.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1048.00 = 35596.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1048.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1049.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1750.00 DOWNSTREAM(FEET) = 1670.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2254.00 CHANNEL SLOPE = 0.0355  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 8755.24  
FLOW VELOCITY(FEET/SEC.) = 21.00 FLOW DEPTH(FEET) = 11.44  
TRAVEL TIME(MIN.) = 1.79 Tc(MIN.) = 60.06  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1048.00 TO NODE 1049.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 60.06  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.489  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 10.20 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" B 2.00 0.30 1.00 72  
NATURAL FAIR COVER  
"WOODLAND" B 11.10 0.30 1.00 60  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 267.80 0.25 1.00 75  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" C 3.40 0.25 0.50 69  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 128.10 0.25 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 422.60  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.77;30M= 1.33;1H= 1.92;3H= 3.91;6H= 6.08;24H=11.06  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 6.4%  
           MOUNTAIN= 87.4%;FOOTHILL= 5.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.24; Ybar = 0.27  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.72; 30M = 0.72; 1HR = 0.72;  
 3HR = 0.95; 6HR = 0.98; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 7549.50  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0327; Lca/L=0.4,n=.0293; Lca/L=0.5,n=.0270;Lca/L=0.6,n=.0252  
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 5174.80  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8926.17  
 TOTAL AREA(ACRES) = 7549.50 PEAK FLOW RATE(CFS) = 8926.17

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.73; 30M = 1.29; 1HR = 1.84; 3HR = 3.66; 6HR = 5.63; 24HR =10.16

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1048.00 TO NODE 1049.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====  
 MAINLINE Tc(MIN) = 60.06  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.950  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "WOODLAND"	C	4.70	0.25	1.00	73
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	391.50	0.20	1.00	81
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	149.60	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	33.60	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 579.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.77;30M= 1.33;1H= 1.92;3H= 3.89;6H= 6.05;24H=11.00  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 86.8%;FOOTHILL= 5.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.24; Ybar = 0.27  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.70; 30M = 0.70; 1HR = 0.70;  
 3HR = 0.95; 6HR = 0.97; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 8128.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0327; Lca/L=0.4,n=.0293; Lca/L=0.5,n=.0270;Lca/L=0.6,n=.0252  
 TIME OF PEAK FLOW(HR) = 16.50 RUNOFF VOLUME(AF) = 5552.56  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9438.57  
 TOTAL AREA(ACRES) = 8128.90 PEAK FLOW RATE(CFS) = 9438.57

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.73; 30M = 1.29; 1HR = 1.84; 3HR = 3.66; 6HR = 5.63; 24HR =10.16

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 8128.90 TC(MIN.) = 60.06  
 AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.27  
 PEAK FLOW RATE(CFS) = 9438.57

=====  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LU50100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.050  
MOUNTAIN 0.870  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1049.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU49100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9438.57 Tc(MIN.) = 60.06  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.27  
TOTAL AREA(ACRES) = 8128.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1049.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9438.57 Tc(MIN.) = 60.06  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.27  
TOTAL AREA(ACRES) = 8128.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1049.00 = 37850.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1049.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1050.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1670.00 DOWNSTREAM(FEET) = 1665.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 290.00 CHANNEL SLOPE = 0.0172  
CHANNEL BASE(FEET) = 25.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9438.57  
FLOW VELOCITY(FEET/SEC.) = 16.48 FLOW DEPTH(FEET) = 14.50  
TRAVEL TIME(MIN.) = 0.29 Tc(MIN.) = 60.35  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1050.00 = 38140.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1049.00 TO NODE 1050.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 60.35  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.485  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 41.60 0.40 1.00 40  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 85.70 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1084.00 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 175.60 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1386.90  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.77;30M= 1.33;1H= 1.91;3H= 3.87;6H= 6.02;24H=10.94  
S-GRAPH: VALLEY(DEV.) = 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.9%;FOOTHILL= 5.1%;DESERT(UNDEV.) = 0.0%  
Tc(HR) = 1.01; LAG(HR) = 0.80; Fm(INCH/HR) = 0.24; Ybar = 0.28

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.68; 30M = 0.68; 1HR = 0.69;  
3HR = 0.94; 6HR = 0.97; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 9515.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1050.00 = 38140.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0327; Lca/L=0.4,n=.0293; Lca/L=0.5,n=.0269;Lca/L=0.6,n=.0251  
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 6404.98  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 10721.31  
TOTAL AREA(ACRES) = 9515.80 PEAK FLOW RATE(CFS) = 10721.31

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.75; 30M = 1.31; 1HR = 1.88; 3HR = 3.78; 6HR = 5.86; 24HR =10.62

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 9515.80 TC(MIN.) = 60.35  
AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.28  
PEAK FLOW RATE(CFS) = 10721.31

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU51100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.050  
MOUNTAIN 0.870  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1050.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU50100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 10721.31 Tc(MIN.) = 60.35  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.28  
TOTAL AREA(ACRES) = 9515.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1050.00 = 38140.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1050.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 10721.31 Tc(MIN.) = 60.35  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.28  
TOTAL AREA(ACRES) = 9515.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1050.00 = 38140.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1050.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1051.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1665.00 DOWNSTREAM(FEET) = 1630.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2134.00 CHANNEL SLOPE = 0.0164  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 10721.31  
FLOW VELOCITY(FEET/SEC.) = 16.58 FLOW DEPTH(FEET) = 14.52  
TRAVEL TIME(MIN.) = 2.14 Tc(MIN.) = 62.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1051.00 = 40274.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1050.00 TO NODE 1051.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 62.50  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.455  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 297.00 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 163.30 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 460.30  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.76;30M= 1.32;1H= 1.91;3H= 3.86;6H= 6.00;24H=10.90  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.9%;FOOTHILL= 5.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.04; LAG(HR) = 0.83; Fm(INCH/HR) = 0.24; Ybar = 0.28  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.68; 1HR = 0.68;  
3HR = 0.94; 6HR = 0.97; 24HR = 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 9976.10

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1051.00 = 40274.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0323; Lca/L=0.4,n=.0289; Lca/L=0.5,n=.0266;Lca/L=0.6,n=.0248  
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 6678.47  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 11143.95  
TOTAL AREA(ACRES) = 9976.10 PEAK FLOW RATE(CFS) = 11143.95

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.72; 30M = 1.28; 1HR = 1.83; 3HR = 3.62; 6HR = 5.55; 24HR =10.00

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 9976.10 TC(MIN.) = 62.50

AREA-AVERAGED Fm(INCH/HR)= 0.24 Ybar = 0.28

PEAK FLOW RATE(CFS) = 11143.95  
=====

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU52100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.050  
MOUNTAIN 0.870  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1051.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU51100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 11143.95 Tc(MIN.) = 62.50  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.28  
TOTAL AREA(ACRES) = 9976.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1051.00 = 40274.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1051.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 11143.95 Tc(MIN.) = 62.50  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.28  
TOTAL AREA(ACRES) = 9976.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1051.00 = 40274.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1051.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1052.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1630.00 DOWNSTREAM(FEET) = 1410.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5523.00 CHANNEL SLOPE = 0.0398  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 11143.95  
FLOW VELOCITY(FEET/SEC.) = 23.09 FLOW DEPTH(FEET) = 11.60  
TRAVEL TIME(MIN.) = 3.99 Tc(MIN.) = 66.48  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1052.00 = 45797.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1051.00 TO NODE 1052.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 66.48  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.405  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 19.10 0.40 1.00 40  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 198.40 0.25 1.00 75  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 507.40 0.20 1.00 81  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" D 26.70 0.20 1.00 86  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 751.60  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.76;30M= 1.32;1H= 1.89;3H= 3.82;6H= 5.92;24H=10.74  
S-GRAPH: VALLEY(DEV.) = 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 86.9%;FOOTHILL= 5.1%;DESERT(UNDEV.) = 0.0%  
Tc(HR) = 1.11; LAG(HR) = 0.89; Fm(INCH/HR) = 0.24; Ybar = 0.28

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.67; 1HR = 0.67;  
3HR = 0.94; 6HR = 0.97; 24HR = 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 10727.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1052.00 = 45797.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0311; Lca/L=0.4,n=.0279; Lca/L=0.5,n=.0256;Lca/L=0.6,n=.0239  
TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 7051.71  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 11522.89  
TOTAL AREA(ACRES) = 10727.70 PEAK FLOW RATE(CFS) = 11522.89

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.66; 30M = 1.23; 1HR = 1.72; 3HR = 3.26; 6HR = 4.90; 24HR = 8.70

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 10727.70 TC(MIN.) = 66.48  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.28  
PEAK FLOW RATE(CFS) = 11522.89

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU53100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=== -----  
1 30.0 20.0 0.018/0.018/0.020 0.67 2.00 0.0312 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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.110  
MOUNTAIN 0.810  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1052.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU52100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 11522.89 Tc(MIN.) = 66.48  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.28  
TOTAL AREA(ACRES) = 10727.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1052.00 = 45797.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1052.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 11522.89 Tc(MIN.) = 66.48  
AREA-AVERAGED Fm(INCH/HR) = 0.24 Ybar = 0.28  
TOTAL AREA(ACRES) = 10727.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1052.00 = 45797.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1052.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1053.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1410.00 DOWNSTREAM(FEET) = 1297.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2262.00 CHANNEL SLOPE = 0.0500  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 11522.89  
FLOW VELOCITY(FEET/SEC.) = 25.29 FLOW DEPTH(FEET) = 11.09  
TRAVEL TIME(MIN.) = 1.49 Tc(MIN.) = 67.97  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1052.00 TO NODE 1053.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 67.97  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.387  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 4.50 0.30 1.00 63  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" B 2.20 0.30 1.00 72  
NATURAL FAIR COVER  
"WOODLAND" B 31.40 0.30 1.00 60  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 214.70 0.25 1.00 75  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" C 21.40 0.25 0.50 69  
NATURAL POOR COVER  
"BARREN" C 0.70 0.25 1.00 91  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.96  
SUBAREA AREA(ACRES) = 274.90  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.76;30M= 1.32;1H= 1.89;3H= 3.82;6H= 5.92;24H=10.74  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
 MOUNTAIN= 86.7%;FOOTHILL= 5.3%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.13; LAG(HR) = 0.91; Fm(INCH/HR) = 0.24; Ybar = 0.28  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.65; 30M = 0.66; 1HR = 0.67;  
 3HR = 0.94; 6HR = 0.97; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 11002.60  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0308; Lca/L=0.4,n=.0276; Lca/L=0.5,n=.0253;Lca/L=0.6,n=.0236  
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 7212.28  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 11579.71  
 TOTAL AREA(ACRES) = 11002.60 PEAK FLOW RATE(CFS) = 11579.71

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.75; 30M = 1.31; 1HR = 1.88; 3HR = 3.78; 6HR = 5.85; 24HR =10.59

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1052.00 TO NODE 1053.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 67.97  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.897  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	C	7.60	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	35.40	0.25	1.00	77
PUBLIC PARK	C	0.20	0.25	0.85	69
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	85.00	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	92.50	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	717.00	0.20	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 937.70

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.76;30M= 1.32;1H= 1.89;3H= 3.81;6H= 5.92;24H=10.73  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
 MOUNTAIN= 86.3%;FOOTHILL= 5.7%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.13; LAG(HR) = 0.91; Fm(INCH/HR) = 0.23; Ybar = 0.28  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.64; 30M = 0.65; 1HR = 0.66;  
 3HR = 0.93; 6HR = 0.97; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 11940.30  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0308; Lca/L=0.4,n=.0276; Lca/L=0.5,n=.0253;Lca/L=0.6,n=.0236  
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 7832.19  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 12388.02  
 TOTAL AREA(ACRES) = 11940.30 PEAK FLOW RATE(CFS) = 12388.02

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.75; 30M = 1.31; 1HR = 1.88; 3HR = 3.78; 6HR = 5.85; 24HR =10.59

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1052.00 TO NODE 1053.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 67.97  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.897

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	2.90	0.20	0.50	75
NATURAL FAIR COVER					
"GRASS"	D	10.20	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	44.50	0.20	1.00	83
PUBLIC PARK	D	0.70	0.20	0.85	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	674.40	0.20	1.00	86
NATURAL FAIR COVER					
"WOODLAND"	D	148.30	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 881.00

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.76;30M= 1.32;1H= 1.89;3H= 3.81;6H= 5.91;24H=10.72  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
 MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.13; LAG(HR) = 0.91; Fm(INCH/HR) = 0.23; Ybar = 0.27  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.62; 30M = 0.64; 1HR = 0.64;  
 3HR = 0.93; 6HR = 0.96; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 12821.30  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0308; Lca/L=0.4,n=.0276; Lca/L=0.5,n=.0253;Lca/L=0.6,n=.0236  
 TIME OF PEAK FLOW(HR) = 16.58 RUNOFF VOLUME(AF) = 8445.45  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13143.39  
 TOTAL AREA(ACRES) = 12821.30 PEAK FLOW RATE(CFS) = 13143.39

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.75; 30M = 1.31; 1HR = 1.88; 3HR = 3.78; 6HR = 5.85; 24HR =10.59

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 12821.30 TC(MIN.) = 67.97  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.27  
 PEAK FLOW RATE(CFS) = 13143.39  
 =====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU54100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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

\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 10.000
- 2) 10.000; 6.000
- 3) 15.000; 4.500
- 4) 20.000; 3.600
- 5) 30.000; 2.750
- 6) 60.000; 1.950
- 7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / PARK- SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.060
MOUNTAIN	0.860
VALLEY(UNDEVELOPED)/DESERT	0.070
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1053.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU53100H.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 13143.39 Tc(MIN.) = 67.97

AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.27

TOTAL AREA(ACRES) = 12821.30

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1053.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 13143.39 Tc(MIN.) = 67.97

AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.27

TOTAL AREA(ACRES) = 12821.30

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1053.00 = 48059.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1053.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1054.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1297.00 DOWNSTREAM(FEET) = 1235.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 3488.00 CHANNEL SLOPE = 0.0178

CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000

MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00

CHANNEL FLOW THRU SUBAREA(CFS) = 13143.39

FLOW VELOCITY(FEET/SEC.) = 21.24 FLOW DEPTH(FEET) = 14.05

TRAVEL TIME(MIN.) = 2.74 Tc(MIN.) = 70.71

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1053.00 TO NODE 1054.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 70.71

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.356

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	435.00	0.25	1.00	75
NATURAL FAIR COVER					
"OPEN BRUSH"	C	7.80	0.25	1.00	77
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	36.00	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	10.20	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	271.30	0.20	1.00	81
NATURAL FAIR COVER					
"OPEN BRUSH"	D	26.90	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 787.20

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.75;30M= 1.31;1H= 1.88;3H= 3.78;6H= 5.86;24H=10.62  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.18; LAG(HR) = 0.94; Fm(INCH/HR) = 0.23; Ybar = 0.27  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.61; 30M = 0.63; 1HR = 0.63;  
 3HR = 0.92; 6HR = 0.96; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 13608.50  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0301; Lca/L=0.4,n=.0270; Lca/L=0.5,n=.0248;Lca/L=0.6,n=.0232  
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 8827.74  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13326.39  
 TOTAL AREA(ACRES) = 13608.50 PEAK FLOW RATE(CFS) = 13326.39

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.67; 30M = 1.24; 1HR = 1.74; 3HR = 3.32; 6HR = 5.01; 24HR = 8.93

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1053.00 TO NODE 1054.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====  
 MAINLINE Tc(MIN) = 70.71  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.879  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	5.30	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	13.70	0.20	1.00	79

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 19.00

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.75;30M= 1.31;1H= 1.88;3H= 3.78;6H= 5.86;24H=10.61  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.18; LAG(HR) = 0.94; Fm(INCH/HR) = 0.23; Ybar = 0.27  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.61; 30M = 0.63; 1HR = 0.63;  
 3HR = 0.92; 6HR = 0.96; 24HR= 0.98  
 UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 13627.50  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0301; Lca/L=0.4,n=.0270; Lca/L=0.5,n=.0248;Lca/L=0.6,n=.0232  
 TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 8837.94  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13339.30  
 TOTAL AREA(ACRES) = 13627.50 PEAK FLOW RATE(CFS) = 13339.30

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.67; 30M = 1.24; 1HR = 1.74; 3HR = 3.32; 6HR = 5.01; 24HR = 8.93

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 13627.50 TC(MIN.) = 70.71  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.27  
 PEAK FLOW RATE(CFS) = 13339.30

=====  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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-----  
FILE NAME: LU55100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.060  
MOUNTAIN 0.860  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1054.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU54100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 13339.30 Tc(MIN.) = 70.71  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.27  
TOTAL AREA(ACRES) = 13627.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1054.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 13339.30 Tc(MIN.) = 70.71  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.27  
TOTAL AREA(ACRES) = 13627.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1054.00 = 51547.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1054.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1055.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 1235.00 DOWNSTREAM(FEET) = 1115.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 3993.00 CHANNEL SLOPE = 0.0301  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 13339.30  
FLOW VELOCITY(FEET/SEC.) = 25.77 FLOW DEPTH(FEET) = 12.25  
TRAVEL TIME(MIN.) = 2.58 Tc(MIN.) = 73.29  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1055.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 73.29  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.328  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	43.80	0.25	1.00	75
NATURAL FAIR COVER "OPEN BRUSH"	C	21.40	0.25	1.00	77
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	C	35.80	0.25	1.00	81
NATURAL FAIR COVER "WOODLAND"	C	11.10	0.25	1.00	73
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	659.60	0.20	1.00	81
NATURAL FAIR COVER "OPEN BRUSH"	D	129.70	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 901.40  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.74;30M= 1.30;1H= 1.87;3H= 3.74;6H= 5.78;24H=10.46  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.22; LAG(HR) = 0.98; Fm(INCH/HR) = 0.23; Ybar = 0.27  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.59; 30M = 0.62; 1HR = 0.62;  
3HR = 0.92; 6HR = 0.96; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 14528.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0294; Lca/L=0.4,n=.0264; Lca/L=0.5,n=.0242;Lca/L=0.6,n=.0226  
TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 9255.89  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 13934.63  
TOTAL AREA(ACRES) = 14528.90 PEAK FLOW RATE(CFS) = 13934.63

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.64; 30M = 1.20; 1HR = 1.67; 3HR = 3.13; 6HR = 4.66; 24HR = 8.21

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1054.00 TO NODE 1055.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 73.29  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.861  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	86.60	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	43.40	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 130.00

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.74;30M= 1.30;1H= 1.87;3H= 3.74;6H= 5.77;24H=10.44  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.22; LAG(HR) = 0.98; Fm(INCH/HR) = 0.23; Ybar = 0.27  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.59; 30M = 0.61; 1HR = 0.62;  
3HR = 0.92; 6HR = 0.96; 24HR= 0.98  
UNIT-INTERVAL(MIN) = 5.00 TOTAL AREA(ACRES) = 14658.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0294; Lca/L=0.4,n=.0264; Lca/L=0.5,n=.0242;Lca/L=0.6,n=.0226  
TIME OF PEAK FLOW(HR) = 16.67 RUNOFF VOLUME(AF) = 9320.85  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14014.64  
TOTAL AREA(ACRES) = 14658.90 PEAK FLOW RATE(CFS) = 14014.64

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.64; 30M = 1.20; 1HR = 1.67; 3HR = 3.13; 6HR = 4.66; 24HR = 8.21

=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 14658.90 TC(MIN.) = 73.29  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.27  
PEAK FLOW RATE(CFS) = 14014.64

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU56100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
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

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	10.000
2)	10.000;	6.000
3)	15.000;	4.500
4)	20.000;	3.600
5)	30.000;	2.750
6)	60.000;	1.950
7)	120.000;	1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / PARK- SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150

GLOBAL STREET FLOW-DEPTH CONSTRAINTS:

- Relative Flow-Depth = 0.00 FEET  
as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
- (Depth)\*(Velocity) Constraint = 6.0 (FT\*FT/S)

\*SIZE PIPE WITH A FLOW CAPACITY GREATER THAN  
OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.010
FOOTHILL	0.060
MOUNTAIN	0.860
VALLEY(UNDEVELOPED)/DESERT	0.070
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1055.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU55100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 14014.64 Tc(MIN.) = 73.29  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.27  
TOTAL AREA(ACRES) = 14658.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1055.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 14014.64 Tc(MIN.) = 73.29  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.27  
TOTAL AREA(ACRES) = 14658.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1055.00 = 55540.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1055.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1056.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 1115.00 DOWNSTREAM(FEET) = 978.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 4363.00 CHANNEL SLOPE = 0.0314  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 14014.64  
FLOW VELOCITY(FEET/SEC.) = 26.55 FLOW DEPTH(FEET) = 12.44  
TRAVEL TIME(MIN.) = 2.74 Tc(MIN.) = 76.03  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1055.00 TO NODE 1056.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 76.03  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.301  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	11.50	0.30	1.00	63
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	B	2.90	0.30	1.00	72
NATURAL FAIR COVER					
"WOODLAND"	B	15.10	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	566.60	0.25	1.00	75
NATURAL FAIR COVER					
"OPEN BRUSH"	C	9.10	0.25	1.00	77
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	601.90	0.25	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1207.10  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.74;30M= 1.30;1H= 1.86;3H= 3.71;6H= 5.72;24H=10.33  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.27; LAG(HR) = 1.01; Fm(INCH/HR) = 0.23; Ybar = 0.28  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.57; 30M = 0.60; 1HR = 0.61;  
 3HR = 0.91; 6HR = 0.96; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 15866.00  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0287; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0221  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 9972.61  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14003.70  
 TOTAL AREA(ACRES) = 15866.00 PEAK FLOW RATE(CFS) = 14014.64  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.67; 30M = 1.24; 1HR = 1.74; 3HR = 3.33; 6HR = 5.02; 24HR = 8.94

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1055.00 TO NODE 1056.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

MAINLINE Tc(MIN) = 76.03  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.843  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "WOODLAND"	C	84.60	0.25	1.00	73
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	433.40	0.20	1.00	81
NATURAL FAIR COVER "OPEN BRUSH"	D	116.90	0.20	1.00	83
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	298.40	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	94.40	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1027.70  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.73;30M= 1.29;1H= 1.85;3H= 3.68;6H= 5.67;24H=10.25  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.27; LAG(HR) = 1.01; Fm(INCH/HR) = 0.23; Ybar = 0.28  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.56; 30M = 0.59; 1HR = 0.60;  
 3HR = 0.91; 6HR = 0.96; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 16893.70  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0287; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0221  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 10525.85  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14661.79  
 TOTAL AREA(ACRES) = 16893.70 PEAK FLOW RATE(CFS) = 14661.79

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.67; 30M = 1.24; 1HR = 1.74; 3HR = 3.33; 6HR = 5.02; 24HR = 8.94

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 16893.70 TC(MIN.) = 76.03  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.28  
 PEAK FLOW RATE(CFS) = 14661.79

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU57100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.060  
MOUNTAIN 0.860  
VALLEY(UNDEVELOPED)/DESERT 0.070  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1056.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU56100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 14661.79 Tc(MIN.) = 76.03  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.28  
TOTAL AREA(ACRES) = 16893.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1056.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 14661.79 Tc(MIN.) = 76.03  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.28  
TOTAL AREA(ACRES) = 16893.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1056.00 = 59903.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1056.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1057.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 978.00 DOWNSTREAM(FEET) = 800.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5201.00 CHANNEL SLOPE = 0.0342  
CHANNEL BASE(FEET) = 30.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 14661.79  
FLOW VELOCITY(FEET/SEC.) = 23.60 FLOW DEPTH(FEET) = 14.09  
TRAVEL TIME(MIN.) = 3.67 Tc(MIN.) = 79.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1056.00 TO NODE 1057.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 79.70  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.266  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 2.00 0.25 1.00 75  
NATURAL FAIR COVER  
"MEADOWS" C 0.90 0.25 1.00 80  
NATURAL FAIR COVER  
"OPEN BRUSH" C 40.20 0.25 1.00 77  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 0.30 0.25 1.00 81  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 208.80 0.20 1.00 81  
NATURAL FAIR COVER  
"OPEN BRUSH" D 155.20 0.20 1.00 83  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 407.40  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.73;30M= 1.29;1H= 1.84;3H= 3.66;6H= 5.63;24H=10.15  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.33; LAG(HR) = 1.06; Fm(INCH/HR) = 0.23; Ybar = 0.28  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.56; 30M = 0.58; 1HR = 0.59;  
 3HR = 0.90; 6HR = 0.96; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 17301.10  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 10654.34  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14763.33  
 TOTAL AREA(ACRES) = 17301.10 PEAK FLOW RATE(CFS) = 14763.33

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.54; 30M = 1.11; 1HR = 1.49; 3HR = 2.56; 6HR = 3.59; 24HR = 6.09

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1056.00 TO NODE 1057.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====  
 MAINLINE Tc(MIN) = 79.70  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.819  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	63.60	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	57.80	0.20	1.00	79

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 121.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.73;30M= 1.29;1H= 1.84;3H= 3.65;6H= 5.61;24H=10.12  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.0%  
           MOUNTAIN= 85.9%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.33; LAG(HR) = 1.06; Fm(INCH/HR) = 0.23; Ybar = 0.28  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.56; 30M = 0.58; 1HR = 0.59;  
 3HR = 0.90; 6HR = 0.96; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 17422.50  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
   Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 10693.91  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14816.00  
 TOTAL AREA(ACRES) = 17422.50 PEAK FLOW RATE(CFS) = 14816.00

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.54; 30M = 1.11; 1HR = 1.49; 3HR = 2.56; 6HR = 3.59; 24HR = 6.09

=====  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 17422.50 TC(MIN.) = 79.70  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.28  
 PEAK FLOW RATE(CFS) = 14816.00

=====  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU58100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--  
  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.100  
MOUNTAIN 0.780  
VALLEY(UNDEVELOPED)/DESERT 0.110  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1057.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME:	LU57100H.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:	
PEAK FLOW RATE(CFS) =	14816.00 Tc(MIN.) = 79.70
AREA-AVERAGED Fm(INCH/HR) =	0.23 Ybar = 0.28
TOTAL AREA(ACRES) =	17422.50
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE 1057.00 = 65104.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1057.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 14816.00 Tc(MIN.) = 79.70  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.28  
TOTAL AREA(ACRES) = 17422.50  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1057.00 = 65104.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1057.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 800.00 DOWNSTREAM(FEET) = 657.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5445.00 CHANNEL SLOPE = 0.0263  
CHANNEL BASE(FEET) = 35.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.050 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 14816.00  
FLOW VELOCITY(FEET/SEC.) = 21.27 FLOW DEPTH(FEET) = 14.16  
TRAVEL TIME(MIN.) = 4.27 Tc(MIN.) = 83.97  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 83.97  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.229  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	96.50	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.70	0.40	0.50	32
NATURAL FAIR COVER					
"OPEN BRUSH"	A	12.00	0.40	1.00	46
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	A	30.00	0.40	1.00	55
NATURAL FAIR COVER					
"WOODLAND"	A	91.00	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	37.50	0.30	1.00	63
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =	0.39				
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =	1.00				
SUBAREA AREA(ACRES) =	267.70				

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.73;30M= 1.29;1H= 1.84;3H= 3.65;6H= 5.60;24H=10.10  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.1%  
MOUNTAIN= 85.8%;FOOTHILL= 6.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.40; LAG(HR) = 1.12; Fm(INCH/HR) = 0.23; Ybar = 0.28  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.55; 30M = 0.58; 1HR = 0.59;  
3HR = 0.90; 6HR = 0.95; 24HR= 0.97  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 17690.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0279; Lca/L=0.4,n=.0250; Lca/L=0.5,n=.0230;Lca/L=0.6,n=.0214  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 10754.26  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14794.07  
TOTAL AREA(ACRES) = 17690.20 PEAK FLOW RATE(CFS) = 14816.00  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.68; 30M = 1.25; 1HR = 1.76; 3HR = 3.39; 6HR = 5.13; 24HR = 9.16

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 83.97  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.790  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	1.30	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	2.40	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	17.50	0.30	1.00	69
COMMERCIAL	B	2.20	0.30	0.10	56
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	B	15.70	0.30	1.00	72
NATURAL FAIR COVER					
"WOODLAND"	B	206.30	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 245.40  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.73;30M= 1.29;1H= 1.84;3H= 3.64;6H= 5.60;24H=10.09  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.1%  
MOUNTAIN= 85.7%;FOOTHILL= 6.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.40; LAG(HR) = 1.12; Fm(INCH/HR) = 0.23; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.55; 30M = 0.57; 1HR = 0.59;  
3HR = 0.90; 6HR = 0.95; 24HR= 0.97  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 17935.60  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0279; Lca/L=0.4,n=.0250; Lca/L=0.5,n=.0230;Lca/L=0.6,n=.0214  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 10848.19  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 14917.07  
TOTAL AREA(ACRES) = 17935.60 PEAK FLOW RATE(CFS) = 14917.07

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.68; 30M = 1.25; 1HR = 1.76; 3HR = 3.39; 6HR = 5.13; 24HR = 9.16

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 83.97

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.790  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	1027.50	0.25	1.00	75
NATURAL FAIR COVER					
"MEADOWS"	C	2.90	0.25	1.00	80
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	0.40	0.25	0.50	69
NATURAL FAIR COVER					
"GRASS"	C	17.00	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	163.50	0.25	1.00	77
COMMERCIAL	C	1.10	0.25	0.10	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1212.40  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.72;30M= 1.29;1H= 1.83;3H= 3.63;6H= 5.57;24H=10.03  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.4%  
MOUNTAIN= 85.2%;FOOTHILL= 6.4%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.40; LAG(HR) = 1.12; Fm(INCH/HR) = 0.23; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.54; 30M = 0.56; 1HR = 0.58;  
3HR = 0.89; 6HR = 0.95; 24HR= 0.97  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 19148.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0279; Lca/L=0.4,n=.0250; Lca/L=0.5,n=.0230;Lca/L=0.6,n=.0214  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 11445.77  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 15599.81  
TOTAL AREA(ACRES) = 19148.00 PEAK FLOW RATE(CFS) = 15599.81

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.68; 30M = 1.25; 1HR = 1.76; 3HR = 3.39; 6HR = 5.13; 24HR = 9.16

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 83.97  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.790  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	572.50	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	252.80	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	1472.40	0.20	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	D	295.00	0.20	1.00	79
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	0.90	0.20	0.50	75
NATURAL FAIR COVER					
"GRASS"	D	2.10	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 2595.70  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.72;30M= 1.28;1H= 1.82;3H= 3.60;6H= 5.52;24H= 9.93  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 7.8%  
MOUNTAIN= 84.4%;FOOTHILL= 6.8%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.40; LAG(HR) = 1.12; Fm(INCH/HR) = 0.23; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.51; 30M = 0.54; 1HR = 0.55;  
 3HR = 0.88; 6HR = 0.95; 24HR= 0.97  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 21743.70  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0279; Lca/L=0.4,n=.0250; Lca/L=0.5,n=.0230;Lca/L=0.6,n=.0214  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 12825.05  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 17108.78  
 TOTAL AREA(ACRES) = 21743.70 PEAK FLOW RATE(CFS) = 17108.78

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.68; 30M = 1.25; 1HR = 1.76; 3HR = 3.39; 6HR = 5.13; 24HR = 9.16

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1057.00 TO NODE 1058.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 83.97  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.790

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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NATURAL FAIR COVER					
"OPEN BRUSH"	D	407.80	0.20	1.00	83
COMMERCIAL	D	0.90	0.20	0.10	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	1735.70	0.20	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 2144.40  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.71;30M= 1.28;1H= 1.82;3H= 3.58;6H= 5.48;24H= 9.86  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
 MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.40; LAG(HR) = 1.12; Fm(INCH/HR) = 0.23; Ybar = 0.28

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.49; 30M = 0.52; 1HR = 0.54;  
 3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 23888.10  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0279; Lca/L=0.4,n=.0250; Lca/L=0.5,n=.0230;Lca/L=0.6,n=.0214  
 TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 14052.26  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18407.86  
 TOTAL AREA(ACRES) = 23888.10 PEAK FLOW RATE(CFS) = 18407.86

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.68; 30M = 1.25; 1HR = 1.76; 3HR = 3.39; 6HR = 5.13; 24HR = 9.16

=====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 23888.10 TC(MIN.) = 83.97  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.28  
 PEAK FLOW RATE(CFS) = 18407.86

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU59100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.070  
MOUNTAIN 0.840  
VALLEY(UNDEVELOPED)/DESERT 0.080  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1058.00 IS CODE = 15.1  
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>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU58100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18407.86 Tc(MIN.) = 83.97  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.28  
TOTAL AREA(ACRES) = 23888.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1058.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18407.86 Tc(MIN.) = 83.97  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.28  
TOTAL AREA(ACRES) = 23888.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1058.00 = 70549.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1058.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 657.00 DOWNSTREAM(FEET) = 630.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2185.00 CHANNEL SLOPE = 0.0124  
CHANNEL BASE(FEET) = 50.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 18407.86  
FLOW VELOCITY(FEET/SEC.) = 19.57 FLOW DEPTH(FEET) = 14.57  
TRAVEL TIME(MIN.) = 1.86 Tc(MIN.) = 85.83  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 85.83  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.213  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	A	21.30	0.40	1.00	40
NATURAL FAIR COVER "OPEN BRUSH"	A	15.80	0.40	1.00	46
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	A	8.90	0.40	1.00	55
NATURAL FAIR COVER "WOODLAND"	A	23.80	0.40	1.00	36
COMMERCIAL NATURAL FAIR COVER "WOODLAND"	B	0.70	0.30	0.10	56
NATURAL FAIR COVER "WOODLAND"	B	2.50	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 73.00  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.71;30M= 1.28;1H= 1.82;3H= 3.58;6H= 5.48;24H= 9.85

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.43; LAG(HR) = 1.14; Fm(INCH/HR) = 0.23; Ybar = 0.28  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.49; 30M = 0.52; 1HR = 0.54;  
3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 23961.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0277; Lca/L=0.4,n=.0249; Lca/L=0.5,n=.0228;Lca/L=0.6,n=.0213  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 14055.83  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18316.66  
TOTAL AREA(ACRES) = 23961.10 PEAK FLOW RATE(CFS) = 18407.86  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.58; 30M = 1.15; 1HR = 1.57; 3HR = 2.80; 6HR = 4.04; 24HR = 6.98

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 85.83  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.778  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 403.90 0.25 1.00 75  
NATURAL POOR COVER  
"BARREN" C 3.80 0.25 1.00 91  
NATURAL FAIR COVER  
"GRASS" C 7.00 0.25 1.00 79  
NATURAL FAIR COVER  
"OPEN BRUSH" C 145.40 0.25 1.00 77  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 167.50 0.25 1.00 81  
NATURAL FAIR COVER  
"WOODLAND" C 36.90 0.25 1.00 73

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 764.50  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.71;30M= 1.27;1H= 1.81;3H= 3.55;6H= 5.43;24H= 9.76  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%

MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.43; LAG(HR) = 1.14; Fm(INCH/HR) = 0.23; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.48; 30M = 0.52; 1HR = 0.54;  
3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 24725.60  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0277; Lca/L=0.4,n=.0249; Lca/L=0.5,n=.0228;Lca/L=0.6,n=.0213  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 14308.77  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18612.79  
TOTAL AREA(ACRES) = 24725.60 PEAK FLOW RATE(CFS) = 18612.79

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.58; 30M = 1.15; 1HR = 1.57; 3HR = 2.80; 6HR = 4.04; 24HR = 6.98

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 85.83

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.778  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 289.70 0.20 1.00 81  
NATURAL FAIR COVER  
"MEADOWS" D 0.20 0.20 1.00 84  
NATURAL FAIR COVER  
"GRASS" D 0.10 0.20 1.00 84  
NATURAL FAIR COVER  
"OPEN BRUSH" D 117.70 0.20 1.00 83  
COMMERCIAL D 3.40 0.20 0.10 75  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" D 287.30 0.20 1.00 86  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 698.40

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.71;30M= 1.27;1H= 1.80;3H= 3.53;6H= 5.39;24H= 9.69  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%

MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.43; LAG(HR) = 1.14; Fm(INCH/HR) = 0.23; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.48; 30M = 0.51; 1HR = 0.53;  
3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 25424.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0277; Lca/L=0.4,n=.0249; Lca/L=0.5,n=.0228;Lca/L=0.6,n=.0213  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 14581.05  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18912.14  
TOTAL AREA(ACRES) = 25424.00 PEAK FLOW RATE(CFS) = 18912.14

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.58; 30M = 1.15; 1HR = 1.57; 3HR = 2.80; 6HR = 4.04; 24HR = 6.98

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1058.00 TO NODE 1059.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 85.83  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.778  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"WOODLAND" D 45.00 0.20 1.00 79  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 45.00

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.71;30M= 1.27;1H= 1.80;3H= 3.53;6H= 5.39;24H= 9.68  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.43; LAG(HR) = 1.14; Fm(INCH/HR) = 0.23; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.48; 30M = 0.51; 1HR = 0.53;  
3HR = 0.87; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 25469.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0277; Lca/L=0.4,n=.0249; Lca/L=0.5,n=.0228;Lca/L=0.6,n=.0213  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 14597.06  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18930.47  
TOTAL AREA(ACRES) = 25469.00 PEAK FLOW RATE(CFS) = 18930.47

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.58; 30M = 1.15; 1HR = 1.57; 3HR = 2.80; 6HR = 4.04; 24HR = 6.98

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 25469.00 TC(MIN.) = 85.83

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.29

PEAK FLOW RATE(CFS) = 18930.47

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU60100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.070  
MOUNTAIN 0.840  
VALLEY(UNDEVELOPED)/DESERT 0.080  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1059.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU59100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18930.47 Tc(MIN.) = 85.83  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.29  
TOTAL AREA(ACRES) = 25469.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1059.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18930.47 Tc(MIN.) = 85.83  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.29  
TOTAL AREA(ACRES) = 25469.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1059.00 = 72734.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1059.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 630.00 DOWNSTREAM(FEET) = 518.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 7828.00 CHANNEL SLOPE = 0.0143  
CHANNEL BASE(FEET) = 50.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 18930.47  
FLOW VELOCITY(FEET/SEC.) = 20.78 FLOW DEPTH(FEET) = 14.19  
TRAVEL TIME(MIN.) = 6.28 Tc(MIN.) = 92.11  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 92.11  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.165  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 37.80 0.40 1.00 40  
NATURAL FAIR COVER  
"OPEN BRUSH" A 124.10 0.40 1.00 46  
COMMERCIAL A 3.70 0.40 0.10 32  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" A 0.20 0.40 1.00 55  
NATURAL FAIR COVER  
"WOODLAND" A 68.90 0.40 1.00 36  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 17.60 0.30 1.00 63  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.39  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 252.30  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.70;30M= 1.27;1H= 1.80;3H= 3.52;6H= 5.37;24H= 9.64

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.54; LAG(HR) = 1.23; Fm(INCH/HR) = 0.23; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.47; 30M = 0.51; 1HR = 0.53;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 25721.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0272; Lca/L=0.4,n=.0244; Lca/L=0.5,n=.0224;Lca/L=0.6,n=.0209  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 14587.33  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18453.19  
TOTAL AREA(ACRES) = 25721.30 PEAK FLOW RATE(CFS) = 18930.47  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 92.11  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.736  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"GRASS" B 1.30 0.30 1.00 69  
NATURAL FAIR COVER  
"OPEN BRUSH" B 11.80 0.30 1.00 66  
COMMERCIAL B 5.10 0.30 0.10 56  
NATURAL FAIR COVER  
"WOODLAND" B 18.00 0.30 1.00 60  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 209.70 0.25 1.00 75  
NATURAL POOR COVER  
"BARREN" C 2.50 0.25 1.00 91

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98  
SUBAREA AREA(ACRES) = 248.40

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.70;30M= 1.27;1H= 1.80;3H= 3.51;6H= 5.35;24H= 9.60  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.54; LAG(HR) = 1.23; Fm(INCH/HR) = 0.23; Ybar = 0.29  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.47; 30M = 0.51; 1HR = 0.53;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 25969.71  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0272; Lca/L=0.4,n=.0244; Lca/L=0.5,n=.0224;Lca/L=0.6,n=.0209  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 14639.70  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18524.02  
TOTAL AREA(ACRES) = 25969.71 PEAK FLOW RATE(CFS) = 18930.47  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 92.11

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.736  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"GRASS" C 28.40 0.25 1.00 79  
NATURAL FAIR COVER  
"OPEN BRUSH" C 502.60 0.25 1.00 77  
COMMERCIAL C 1.30 0.25 0.10 69  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 6.10 0.25 1.00 81  
NATURAL FAIR COVER  
"WOODLAND" C 9.90 0.25 1.00 73  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 46.10 0.20 1.00 81  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 594.40  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.70;30M= 1.26;1H= 1.79;3H= 3.49;6H= 5.31;24H= 9.51

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.54; LAG(HR) = 1.23; Fm(INCH/HR) = 0.23; Ybar = 0.30  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.47; 30M = 0.50; 1HR = 0.52;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 26564.11  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0272; Lca/L=0.4,n=.0244; Lca/L=0.5,n=.0224;Lca/L=0.6,n=.0209  
TIME OF PEAK FLOW(HR) = 16.83 RUNOFF VOLUME(AF) = 14780.74  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18700.54  
TOTAL AREA(ACRES) = 26564.11 PEAK FLOW RATE(CFS) = 18930.47  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1059.00 TO NODE 1060.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 92.11  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.736  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"GRASS" D 30.10 0.20 1.00 84  
NATURAL FAIR COVER  
"OPEN BRUSH" D 129.80 0.20 1.00 83  
COMMERCIAL D 1.70 0.20 0.10 75  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" D 38.00 0.20 1.00 86  
NATURAL FAIR COVER  
"WOODLAND" D 91.10 0.20 1.00 79  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 290.70

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.70;30M= 1.26;1H= 1.78;3H= 3.47;6H= 5.29;24H= 9.47  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.1%  
MOUNTAIN= 83.8%;FOOTHILL= 7.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.54; LAG(HR) = 1.23; Fm(INCH/HR) = 0.23; Ybar = 0.30  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.47; 30M = 0.50; 1HR = 0.52;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96

UNIT-INTERVAL(MIN) = 10.00    TOTAL AREA(ACRES) = 26854.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0272; Lca/L=0.4,n=.0244; Lca/L=0.5,n=.0224;Lca/L=0.6,n=.0209  
TIME OF PEAK FLOW(HR) = 16.83    RUNOFF VOLUME(AF) = 14862.71  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18797.48  
TOTAL AREA(ACRES) = 26854.80    PEAK FLOW RATE(CFS) = 18930.47  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES)    = 26854.80    TC(MIN.) = 92.11  
AREA-AVERAGED Fm(INCH/HR)= 0.23    Ybar = 0.30  
PEAK FLOW RATE(CFS)    = 18930.47

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LU61100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--  
  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.010  
FOOTHILL 0.130  
MOUNTAIN 0.660  
VALLEY(UNDEVELOPED)/DESERT 0.200  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1060.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU60100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18930.47 Tc(MIN.) = 92.11  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.30  
TOTAL AREA(ACRES) = 26854.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1060.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18930.47 Tc(MIN.) = 92.11  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.30  
TOTAL AREA(ACRES) = 26854.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1060.00 = 80562.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1060.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 518.00 DOWNSTREAM(FEET) = 435.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 8004.00 CHANNEL SLOPE = 0.0104  
CHANNEL BASE(FEET) = 55.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 18930.47  
FLOW VELOCITY(FEET/SEC.) = 18.33 FLOW DEPTH(FEET) = 14.80  
TRAVEL TIME(MIN.) = 7.28 Tc(MIN.) = 99.39  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 99.39  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.116  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	72.70	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	9.10	0.40	0.50	32
NATURAL POOR COVER					
"BARREN"	A	0.20	0.40	1.00	78
NATURAL FAIR COVER					
"GRASS"	A	4.00	0.40	1.00	50
NATURAL FAIR COVER					
"OPEN BRUSH"	A	97.50	0.40	1.00	46
COMMERCIAL	A	8.10	0.40	0.10	32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94					
SUBAREA AREA(ACRES) = 191.60					
UNIT-HYDROGRAPH DATA:					
RAINFALL(INCH): 5M= 0.70;30M= 1.26;1H= 1.78;3H= 3.47;6H= 5.28;24H= 9.46					

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.2%  
MOUNTAIN= 83.7%;FOOTHILL= 7.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.66; LAG(HR) = 1.33; Fm(INCH/HR) = 0.23; Ybar = 0.30  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.46; 30M = 0.50; 1HR = 0.52;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 27046.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0270; Lca/L=0.4,n=.0242; Lca/L=0.5,n=.0222;Lca/L=0.6,n=.0208  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 14884.70  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18567.77  
TOTAL AREA(ACRES) = 27046.40 PEAK FLOW RATE(CFS) = 18930.47  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.60; 30M = 1.17; 1HR = 1.60; 3HR = 2.90; 6HR = 4.22; 24HR = 7.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 99.39  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.687  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" A 8.70 0.40 1.00 55  
NATURAL FAIR COVER  
"WOODLAND" A 70.50 0.40 1.00 36  
NATURAL FAIR COVER  
"GRASS" B 0.80 0.30 1.00 69  
NATURAL FAIR COVER  
"OPEN BRUSH" B 18.30 0.30 1.00 66  
COMMERCIAL B 2.90 0.30 0.10 56  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" B 1.60 0.30 1.00 72  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.38  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97  
SUBAREA AREA(ACRES) = 102.80

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.70;30M= 1.26;1H= 1.78;3H= 3.47;6H= 5.28;24H= 9.45  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 8.2%  
MOUNTAIN= 83.6%;FOOTHILL= 7.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.66; LAG(HR) = 1.33; Fm(INCH/HR) = 0.23; Ybar = 0.30  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.46; 30M = 0.50; 1HR = 0.52;  
3HR = 0.86; 6HR = 0.94; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 27149.20  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0270; Lca/L=0.4,n=.0242; Lca/L=0.5,n=.0222;Lca/L=0.6,n=.0208  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 14895.94  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18590.75  
TOTAL AREA(ACRES) = 27149.20 PEAK FLOW RATE(CFS) = 18930.47  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.60; 30M = 1.17; 1HR = 1.60; 3HR = 2.90; 6HR = 4.22; 24HR = 7.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 99.39

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.687  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"WOODLAND" B 16.20 0.30 1.00 60  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 1119.80 0.25 1.00 75  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" C 17.10 0.25 0.50 69  
NATURAL POOR COVER  
"BARREN" C 18.20 0.25 1.00 91  
NATURAL FAIR COVER  
"GRASS" C 128.60 0.25 1.00 79  
NATURAL FAIR COVER  
"OPEN BRUSH" C 739.90 0.25 1.00 77  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 2039.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.69;30M= 1.25;1H= 1.77;3H= 3.43;6H= 5.20;24H= 9.30  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 9.0%  
MOUNTAIN= 82.4%;FOOTHILL= 7.6%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.66; LAG(HR) = 1.33; Fm(INCH/HR) = 0.23; Ybar = 0.31  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.45; 30M = 0.49; 1HR = 0.51;  
3HR = 0.85; 6HR = 0.93; 24HR= 0.96  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 29189.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0270; Lca/L=0.4,n=.0242; Lca/L=0.5,n=.0222;Lca/L=0.6,n=.0208  
TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 15616.08  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19366.18  
TOTAL AREA(ACRES) = 29189.00 PEAK FLOW RATE(CFS) = 19366.18  
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.60; 30M = 1.17; 1HR = 1.60; 3HR = 2.90; 6HR = 4.22; 24HR = 7.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 99.39  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.687  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
COMMERCIAL C 0.10 0.25 0.10 69  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 195.30 0.25 1.00 81  
NATURAL FAIR COVER  
"WOODLAND" C 132.20 0.25 1.00 73  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 1067.40 0.20 1.00 81  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" D 23.60 0.20 0.50 75  
NATURAL POOR COVER  
"BARREN" D 34.20 0.20 1.00 93  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 1452.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.68;30M= 1.25;1H= 1.76;3H= 3.40;6H= 5.15;24H= 9.21  
S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 9.5%  
MOUNTAIN= 81.6%;FOOTHILL= 7.8%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.66; LAG(HR) = 1.33; Fm(INCH/HR) = 0.23; Ybar = 0.31  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.44; 30M = 0.48; 1HR = 0.50;  
 3HR = 0.85; 6HR = 0.93; 24HR= 0.96  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 30641.80  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0270; Lca/L=0.4,n=.0242; Lca/L=0.5,n=.0222;Lca/L=0.6,n=.0208  
 TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 16185.08  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19946.53  
 TOTAL AREA(ACRES) = 30641.80 PEAK FLOW RATE(CFS) = 19946.53

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.60; 30M = 1.17; 1HR = 1.60; 3HR = 2.90; 6HR = 4.22; 24HR = 7.35

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1060.00 TO NODE 1061.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

=====

MAINLINE Tc(MIN) = 99.39  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.687  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "GRASS"	D	99.70	0.20	1.00	84
NATURAL FAIR COVER "OPEN BRUSH"	D	651.20	0.20	1.00	83
COMMERCIAL	D	3.60	0.20	0.10	75
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	574.70	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	210.30	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1539.50  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.68;30M= 1.25;1H= 1.75;3H= 3.38;6H= 5.11;24H= 9.12  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 10.0%  
 MOUNTAIN= 80.9%;FOOTHILL= 8.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.66; LAG(HR) = 1.33; Fm(INCH/HR) = 0.23; Ybar = 0.31  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.43; 30M = 0.47; 1HR = 0.49;  
 3HR = 0.84; 6HR = 0.93; 24HR= 0.96  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 32181.30  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0270; Lca/L=0.4,n=.0242; Lca/L=0.5,n=.0222;Lca/L=0.6,n=.0208  
 TIME OF PEAK FLOW(HR) = 17.33 RUNOFF VOLUME(AF) = 16821.61  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20625.61  
 TOTAL AREA(ACRES) = 32181.30 PEAK FLOW RATE(CFS) = 20625.61

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.60; 30M = 1.17; 1HR = 1.60; 3HR = 2.90; 6HR = 4.22; 24HR = 7.35

=====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 32181.30 TC(MIN.) = 99.39  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.31  
 PEAK FLOW RATE(CFS) = 20625.61

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

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RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

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FILE NAME: LU62100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
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-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	10.000
2)	10.000;	6.000
3)	15.000;	4.500
4)	20.000;	3.600
5)	30.000;	2.750
6)	60.000;	1.950
7)	120.000;	1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)

VALLEY(DEVELOPED)	0.010
FOOTHILL	0.310
MOUNTAIN	0.260
VALLEY(UNDEVELOPED)/DESERT	0.420
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1061.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU61100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 20625.61 Tc(MIN.) = 99.39  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.31  
TOTAL AREA(ACRES) = 32181.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1061.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 20625.61 Tc(MIN.) = 99.39  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.31  
TOTAL AREA(ACRES) = 32181.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1061.00 = 88566.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1061.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 435.00 DOWNSTREAM(FEET) = 345.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 8275.00 CHANNEL SLOPE = 0.0109  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 1.000  
MANNING'S FACTOR = 0.040 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 20625.61  
FLOW VELOCITY(FEET/SEC.) = 18.89 FLOW DEPTH(FEET) = 14.63  
TRAVEL TIME(MIN.) = 7.30 Tc(MIN.) = 106.69  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 106.69  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.071  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	36.50	0.40	1.00	40
NATURAL FAIR COVER					
"WOODLAND"	A	444.40	0.40	1.00	36
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	1.00	0.40	0.50	32
NATURAL POOR COVER					
"BARREN"	A	6.90	0.40	1.00	78
NATURAL FAIR COVER					
"GRASS"	A	60.30	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	2.20	0.40	1.00	44

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 551.30  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.68;30M= 1.24;1H= 1.75;3H= 3.37;6H= 5.09;24H= 9.09  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 10.6%  
 MOUNTAIN= 79.9%;FOOTHILL= 8.5%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.78; LAG(HR) = 1.42; Fm(INCH/HR) = 0.23; Ybar = 0.32  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.43; 30M = 0.46; 1HR = 0.49;  
 3HR = 0.84; 6HR = 0.93; 24HR= 0.96  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 32732.61  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0268; Lca/L=0.4,n=.0240; Lca/L=0.5,n=.0221;Lca/L=0.6,n=.0206  
 TIME OF PEAK FLOW(HR) = 17.00 RUNOFF VOLUME(AF) = 16840.10  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20353.74  
 TOTAL AREA(ACRES) = 32732.61 PEAK FLOW RATE(CFS) = 20625.61  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.58; 30M = 1.15; 1HR = 1.57; 3HR = 2.81; 6HR = 4.06; 24HR = 7.02

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 106.69  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.639  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN FAIR COVER					
"TURF"	A	1.30	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	138.50	0.40	1.00	46
COMMERCIAL	A	5.60	0.40	0.10	32
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	A	1.80	0.40	1.00	55
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	13.80	0.30	1.00	63
AGRICULTURAL POOR COVER					
"FALLOW"	B	2.70	0.30	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.39  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97  
 SUBAREA AREA(ACRES) = 163.70  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.68;30M= 1.24;1H= 1.75;3H= 3.37;6H= 5.09;24H= 9.07  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 10.7%  
 MOUNTAIN= 79.7%;FOOTHILL= 8.6%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.78; LAG(HR) = 1.42; Fm(INCH/HR) = 0.23; Ybar = 0.32  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.42; 30M = 0.46; 1HR = 0.49;  
 3HR = 0.84; 6HR = 0.93; 24HR= 0.96  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 32896.30  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0268; Lca/L=0.4,n=.0240; Lca/L=0.5,n=.0221;Lca/L=0.6,n=.0206  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 16858.64  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20397.21  
 TOTAL AREA(ACRES) = 32896.30 PEAK FLOW RATE(CFS) = 20625.61  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.58; 30M = 1.15; 1HR = 1.57; 3HR = 2.81; 6HR = 4.06; 24HR = 7.02

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 106.69  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.639  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	2.30	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	5.00	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	51.10	0.30	1.00	69
URBAN FAIR COVER					
"TURF"	B	10.00	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	258.20	0.30	1.00	66
COMMERCIAL	B	64.50	0.30	0.10	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.85  
 SUBAREA AREA(ACRES) = 391.10  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.68;30M= 1.24;1H= 1.75;3H= 3.36;6H= 5.08;24H= 9.05  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 11.1%  
 MOUNTAIN= 79.0%;FOOTHILL= 8.8%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.78; LAG(HR) = 1.42; Fm(INCH/HR) = 0.23; Ybar = 0.32  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.42; 30M = 0.46; 1HR = 0.49;  
 3HR = 0.84; 6HR = 0.93; 24HR= 0.96  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 33287.41  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0268; Lca/L=0.4,n=.0240; Lca/L=0.5,n=.0221;Lca/L=0.6,n=.0206  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 16971.74  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20554.26  
 TOTAL AREA(ACRES) = 33287.41 PEAK FLOW RATE(CFS) = 20625.61  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.58; 30M = 1.15; 1HR = 1.57; 3HR = 2.81; 6HR = 4.06; 24HR = 7.02

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 106.69  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.639  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	B	6.20	0.30	0.85	56
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	B	17.10	0.30	1.00	72
NATURAL FAIR COVER					
"WOODLAND"	B	74.10	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	1292.00	0.25	1.00	75
NATURAL FAIR COVER					
"WOODLAND"	C	636.80	0.25	1.00	73
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	6.90	0.25	0.50	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 2033.10  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.67;30M= 1.24;1H= 1.74;3H= 3.33;6H= 5.02;24H= 8.93  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 12.9%  
 MOUNTAIN= 76.0%;FOOTHILL= 10.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.78; LAG(HR) = 1.42; Fm(INCH/HR) = 0.24; Ybar = 0.33



USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.41; 30M = 0.45; 1HR = 0.48;  
 3HR = 0.83; 6HR = 0.92; 24HR = 0.95  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 35320.51  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0268; Lca/L=0.4,n=.0240; Lca/L=0.5,n=.0221;Lca/L=0.6,n=.0206  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 17594.75  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 21371.47  
 TOTAL AREA(ACRES) = 35320.51 PEAK FLOW RATE(CFS) = 21371.47

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.58; 30M = 1.15; 1HR = 1.57; 3HR = 2.81; 6HR = 4.06; 24HR = 7.02

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 106.69  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.639  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER "BARREN"	C	40.70	0.25	1.00	91
NATURAL FAIR COVER "GRASS"	C	190.10	0.25	1.00	79
URBAN FAIR COVER "TURF"	C	87.00	0.25	1.00	77
NATURAL FAIR COVER "OPEN BRUSH"	C	2310.80	0.25	1.00	77
COMMERCIAL	C	161.30	0.25	0.10	69
PUBLIC PARK	C	8.70	0.25	0.85	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
 SUBAREA AREA(ACRES) = 2798.60

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.66;30M= 1.23;1H= 1.73;3H= 3.29;6H= 4.95;24H= 8.79  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 15.0%  
 MOUNTAIN= 72.3%;FOOTHILL= 11.7%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.78; LAG(HR) = 1.42; Fm(INCH/HR) = 0.24; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.40; 30M = 0.44; 1HR = 0.47;  
 3HR = 0.82; 6HR = 0.92; 24HR = 0.95  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 38119.11  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0268; Lca/L=0.4,n=.0240; Lca/L=0.5,n=.0221;Lca/L=0.6,n=.0206  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 18544.37  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 22526.08  
 TOTAL AREA(ACRES) = 38119.11 PEAK FLOW RATE(CFS) = 22526.08

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.58; 30M = 1.15; 1HR = 1.57; 3HR = 2.81; 6HR = 4.06; 24HR = 7.02

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 106.69  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.639  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	C	389.30	0.25	1.00	81

NATURAL FAIR COVER  
 "CHAPARRAL,BROADLEAF" D 1418.60 0.20 1.00 81  
 NATURAL FAIR COVER  
 "MEADOWS" D 3.10 0.20 1.00 84  
 NATURAL FAIR COVER  
 "WOODLAND" D 963.30 0.20 1.00 79  
 RESIDENTIAL  
 "5-7 DWELLINGS/ACRE" D 0.80 0.20 0.50 75  
 NATURAL POOR COVER  
 "BARREN" D 84.90 0.20 1.00 93

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 2860.00

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.66;30M= 1.23;1H= 1.71;3H= 3.26;6H= 4.88;24H= 8.67  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 16.9%  
 MOUNTAIN= 69.1%;FOOTHILL= 13.0%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.78; LAG(HR) = 1.42; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.38; 30M = 0.43; 1HR = 0.46;  
 3HR = 0.81; 6HR = 0.92; 24HR = 0.95  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 40979.11  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0268; Lca/L=0.4,n=.0240; Lca/L=0.5,n=.0221;Lca/L=0.6,n=.0206  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 19568.42  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 23737.68  
 TOTAL AREA(ACRES) = 40979.11 PEAK FLOW RATE(CFS) = 23737.68

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.58; 30M = 1.15; 1HR = 1.57; 3HR = 2.81; 6HR = 4.06; 24HR = 7.02

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 106.69  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.639  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "GRASS"	D	865.20	0.20	1.00	84
AGRICULTURAL FAIR COVER "ORCHARDS"	D	0.20	0.20	1.00	82
URBAN FAIR COVER "TURF"	D	57.80	0.20	1.00	82
NATURAL FAIR COVER "OPEN BRUSH"	D	2760.50	0.20	1.00	83
COMMERCIAL	D	225.30	0.20	0.10	75
PUBLIC PARK	D	2.90	0.20	0.85	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
 SUBAREA AREA(ACRES) = 3911.90

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.65;30M= 1.22;1H= 1.70;3H= 3.22;6H= 4.81;24H= 8.53  
 S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 19.1%  
 MOUNTAIN= 65.3%;FOOTHILL= 14.6%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.78; LAG(HR) = 1.42; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.41; 1HR = 0.45;  
 3HR = 0.80; 6HR = 0.91; 24HR = 0.95  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 44891.01  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0268; Lca/L=0.4,n=.0240; Lca/L=0.5,n=.0221;Lca/L=0.6,n=.0206  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 21077.60

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 25429.14  
TOTAL AREA(ACRES) = 44891.01 PEAK FLOW RATE(CFS) = 25429.14

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.58; 30M = 1.15; 1HR = 1.57; 3HR = 2.81; 6HR = 4.06; 24HR = 7.02

\*\*\*\*\*

FLOW PROCESS FROM NODE 1061.00 TO NODE 1062.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 106.69

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.639

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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NATURAL GOOD COVER

"MEADOWS"	D	0.20	0.20	1.00	78
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NATURAL FAIR COVER

"CHAPARRAL,NARROWLEAF"	D	1546.10	0.20	1.00	86
------------------------	---	---------	------	------	----

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 1546.30

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.65;30M= 1.22;1H= 1.70;3H= 3.20;6H= 4.79;24H= 8.48

S-GRAPH: VALLEY(DEV.)= 1.0%;VALLEY(UNDEV.)/DESERT= 19.9%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.78; LAG(HR) = 1.42; Fm(INCH/HR) = 0.23; Ybar = 0.32

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.41; 1HR = 0.44;

3HR = 0.79; 6HR = 0.91; 24HR= 0.95

UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 46437.31

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0268; Lca/L=0.4,n=.0240; Lca/L=0.5,n=.0221;Lca/L=0.6,n=.0206

TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 21690.53

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26077.13

TOTAL AREA(ACRES) = 46437.31 PEAK FLOW RATE(CFS) = 26077.13

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.58; 30M = 1.15; 1HR = 1.57; 3HR = 2.81; 6HR = 4.06; 24HR = 7.02

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 46437.31 TC(MIN.) = 106.69

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.32

PEAK FLOW RATE(CFS) = 26077.13

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*

FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Analysis prepared by:

Huitt - Zollars, Inc.  
 430 Exchange, Suite 200  
 Irvine, CA. 92602-1309  
 714 - 734 - 5100

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 FILE NAME: LU35002E.FLD  
 TIME/DATE OF STUDY: 13:11 02/25/2004

\*\*\*\*\*

FLOW PROCESS FROM NODE 1000.00 TO NODE 1035.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 826.200 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 0.840 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.030  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.920  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.050  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.600  
 LOW LOSS FRACTION = 0.740  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.18  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.32  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.46  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.94  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.46  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.67

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.963  
 30-MINUTE FACTOR = 0.963  
 1-HOUR FACTOR = 0.963  
 3-HOUR FACTOR = 0.994  
 6-HOUR FACTOR = 0.997  
 24-HOUR FACTOR = 0.998

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 9.921

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	1.075	107.370
2	3.342	226.564
3	6.452	310.788
4	10.509	405.295
5	16.062	554.891
6	23.361	729.267
7	31.456	808.820
8	37.773	631.275
9	42.919	514.169
10	47.476	455.318
11	51.460	398.094
12	54.436	297.283
13	56.987	254.937
14	59.129	213.965
15	61.202	207.192
16	63.137	193.363
17	64.820	168.142
18	66.379	155.747
19	67.866	148.622
20	69.238	137.068
21	70.505	126.588
22	71.753	124.657
23	72.947	119.320
24	73.971	102.311
25	74.949	97.742
26	75.863	91.355
27	76.761	89.669
28	77.601	84.015
29	78.426	82.396
30	79.194	76.730
31	79.901	70.659
32	80.602	70.000
33	81.272	66.941
34	81.926	65.331
35	82.578	65.149
36	83.153	57.470
37	83.679	52.564
38	84.205	52.563
39	84.724	51.874
40	85.176	45.120
41	85.609	43.335
42	86.041	43.150
43	86.467	42.554
44	86.875	40.774
45	87.253	37.707
46	87.627	37.415
47	88.001	37.372
48	88.375	37.373
49	88.739	36.376
50	89.077	33.792
51	89.414	33.608
52	89.749	33.469
53	90.080	33.128
54	90.412	33.111
55	90.726	31.412
56	91.020	29.386
57	91.314	29.349
58	91.608	29.420
59	91.902	29.384
60	92.196	29.386
61	92.485	28.877
62	92.738	25.282

63	92.980	24.140
64	93.221	24.035
65	93.461	24.036
66	93.702	24.072
67	93.942	24.001
68	94.183	24.068
69	94.412	22.841
70	94.601	18.896
71	94.787	18.569
72	94.972	18.568
73	95.158	18.572
74	95.344	18.569
75	95.530	18.533
76	95.716	18.607
77	95.902	18.569
78	96.087	18.534
79	96.268	18.027
80	96.411	14.299
81	96.547	13.645
82	96.682	13.459
83	96.817	13.495
84	96.952	13.459
85	97.087	13.495
86	97.222	13.495
87	97.357	13.459
88	97.492	13.531
89	97.626	13.386
90	97.761	13.531
91	97.893	13.161
92	98.024	13.103
93	98.145	12.089
94	98.194	4.922
95	98.231	3.619
96	98.267	3.619
97	98.302	3.475
98	98.338	3.619
99	98.374	3.619
100	98.410	3.547
101	98.446	3.619
102	98.481	3.547
103	98.518	3.619
104	98.553	3.548
105	98.589	3.546
106	98.626	3.693
107	98.661	3.546
108	98.697	3.548
109	98.733	3.619
110	98.768	3.547
111	98.804	3.619
112	98.839	3.475
113	98.876	3.693
114	98.911	3.474
115	98.947	3.619
116	98.983	3.620
117	99.019	3.547
118	99.055	3.619
119	99.091	3.619
120	99.128	3.619
121	99.164	3.619
122	99.200	3.620
123	99.236	3.619
124	99.273	3.619
125	99.309	3.619
126	99.345	3.619
127	99.381	3.619
128	99.417	3.619
129	99.454	3.619
130	99.490	3.620

131	99.526	3.619
132	99.562	3.619
133	99.599	3.619
134	99.635	3.619
135	99.671	3.619
136	99.707	3.619
137	99.743	3.619
138	99.780	3.619
139	99.816	3.620
140	99.852	3.619
141	99.888	3.619
142	99.925	3.619
143	99.961	3.619
144	99.997	3.619
145	100.000	0.298

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 130.4180  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 53.0790  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	50.0	100.0	150.0	200.0
14.000	16.2818	33.21	.	Q	.	V	.
14.083	16.5139	33.70	.	Q	.	V	.
14.167	16.7498	34.24	.	Q	.	V	.
14.250	16.9895	34.81	.	Q	.	V	.
14.333	17.2335	35.42	.	Q	.	V	.
14.417	17.4821	36.09	.	Q	.	V	.
14.500	17.7356	36.82	.	Q	.	V	.
14.583	17.9945	37.58	.	Q	.	V	.
14.667	18.2584	38.32	.	Q	.	V	.
14.750	18.5273	39.05	.	Q	.	V	.
14.833	18.8012	39.78	.	Q	.	V	.
14.917	19.0804	40.53	.	Q	.	V	.
15.000	19.3647	41.28	.	Q	.	V	.
15.083	19.6543	42.06	.	Q	.	V	.
15.167	19.9495	42.86	.	Q	.	V	.
15.250	20.2507	43.73	.	Q	.	V	.
15.333	20.5581	44.63	.	Q	.	V	.
15.417	20.8711	45.45	.	Q	.	V	.
15.500	21.1891	46.17	.	Q	.	V	.
15.583	21.5121	46.90	.	Q	.	V	.
15.667	21.8400	47.62	.	Q	.	V	.
15.750	22.1710	48.05	.	Q	.	V	.
15.833	22.5026	48.16	.	Q	.	V	.
15.917	22.8363	48.45	.	Q	.	V	.
16.000	23.1779	49.60	.	Q	.	V	.
16.083	23.6142	63.36	.	Q	.	V	.
16.167	24.1523	78.13	.	Q	.	V	.
16.250	24.7654	89.02	.	Q	.	V	.
16.333	25.4671	101.89	.	Q	.	V	.
16.417	26.3024	121.29	.	Q	.	V	.
16.500	27.2838	142.50	.	Q	.	V	.
16.583	28.3252	151.22	.	Q	.	V	.
16.667	29.2215	130.14	.	Q	.	V	.
16.750	30.0221	116.24	.	Q	.	V	.
16.833	30.7715	108.82	.	Q	.	V	.
16.917	31.4697	101.38	.	Q	.	V	.
17.000	32.0815	88.83	.	Q	.	V	.
17.083	32.6534	83.04	.	Q	.	V	.
17.167	33.1866	77.42	.	Q	.	V	.
17.250	33.7082	75.73	.	Q	.	V	.
17.333	34.2116	73.11	.	Q	.	V	.
17.417	34.6883	69.22	.	Q	.	V	.
17.500	35.1483	66.78	.	Q	.	V	.
17.583	35.5956	64.95	.	Q	.	V	.
17.667	36.0275	62.72	.	Q	.	V	.
17.750	36.4455	60.69	.	Q	.	V	.
17.833	36.8564	59.66	.	Q	.	V	.
17.917	37.2574	58.23	.	Q	.	V	.
18.000	37.6399	55.54	.	Q	.	V	.
18.083	38.0133	54.22	.	Q	.	V	.
18.167	38.3756	52.60	.	Q	.	V	.
18.250	38.7301	51.47	.	Q	.	V	.
18.333	39.0731	49.80	.	Q	.	V	.
18.417	39.4067	48.45	.	Q	.	V	.
18.500	39.7266	46.45	.	Q	.	V	.
18.583	40.0321	44.36	.	Q	.	V	.

18.667	40.3291	43.11	.	Q	.	V	.
18.750	40.6166	41.74	.	Q	.	V	.
18.833	40.8962	40.60	.	Q	.	V	.
18.917	41.1693	39.66	.	Q	.	V	.
19.000	41.4310	38.00	.	Q	.	V	.
19.083	41.6842	36.75	.	Q	.	V	.
19.167	41.9329	36.11	.	Q	.	V	.
19.250	42.1766	35.39	.	Q	.	V	.
19.333	42.4108	34.01	.	Q	.	V	.
19.417	42.6399	33.26	.	Q	.	V	.
19.500	42.8653	32.72	.	Q	.	V	.
19.583	43.0867	32.15	.	Q	.	V	.
19.667	43.3033	31.45	.	Q	.	V	.
19.750	43.5142	30.64	.	Q	.	V	.
19.833	43.7219	30.16	.	Q	.	V	.
19.917	43.9266	29.72	.	Q	.	V	.
20.000	44.1285	29.31	.	Q	.	V	.

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END OF FLOODSCx ROUTING ANALYSIS

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**PRELIMINARY DRAFT – FOR INTERNAL USE ONLY**

**TECHNICAL APPENDIX I-B  
HYDROLOGIC ANALYSIS  
EXISTING CONDITION  
2-YEAR EXPECTED VALUE**

Hydrologic Analyses of Upstream Areas not Contemplated to be  
Developed are not Duplicated in this Technical Appendix  
See Technical Appendix I-A

## Rainfall Depths

### 2-Year - Expected Value - Existing Condition

Subarea	Area			Rainfall Depth						Node	Area			Rainfall Depth					
	(ac)	< 2000 (ac)	> 2000 (ac)	5-min	30-min	1-hr	3-hr	6-hr	24-hr		(ac)	< 2000 (ac)	> 2000 (ac)	5-min	30-min	1-hr	3-hr	6-hr	24-hr
		X		0.13	0.28	0.37	0.62	0.85	1.44			X		0.13	0.28	0.37	0.62	0.85	1.44
			X	0.18	0.32	0.46	0.94	1.46	2.67			X		0.18	0.32	0.46	0.94	1.46	2.67
1062	3,455.0	3,014.8	440.2	0.14	0.29	0.38	0.66	0.93	1.60	1063	49,893.6	26,019.6	23,874.0	0.15	0.30	0.41	0.77	1.14	2.03
1063	1,335.4	1,335.4	0.0	0.13	0.28	0.37	0.62	0.85	1.44	1064	51,229.0	27,355.0	23,874.0	0.15	0.30	0.41	0.77	1.13	2.01
1064	1,896.8	1,896.8	0.0	0.13	0.28	0.37	0.62	0.85	1.44	1065	53,125.8	29,251.8	23,874.0	0.15	0.30	0.41	0.76	1.12	1.99
1065	8,303.5	8,303.5	0.0	0.13	0.28	0.37	0.62	0.85	1.44	1066	61,429.3	37,555.3	23,874.0	0.15	0.30	0.40	0.74	1.09	1.92
1066	5,184.1	5,184.1	0.0	0.13	0.28	0.37	0.62	0.85	1.44	1067	66,613.4	42,739.4	23,874.0	0.15	0.29	0.40	0.73	1.07	1.88
1067	1,594.1	1,594.1	0.0	0.13	0.28	0.37	0.62	0.85	1.44	1068	68,207.5	44,333.5	23,874.0	0.15	0.29	0.40	0.73	1.06	1.87



## Channel Hydraulics, Travel Times, Times of Concentration, and Lag Estimates 2-Year - Expected Value - Existing Condition

U/S Node	D/S Node	U/S Elevation	D/S Elevation	Length (ft)	Manning (n)	Base (ft)	Sideslope (z)	Height (ft)	Q(2) (cfs)	Dn (ft)	V (fps)	Tt (min)	Tc (min)	Lag (hr)
1062	1063	345	319	2852	0.025	60	2	15	1,943	2.81	10.56	4.50	233.98	3.12
1063	1064	319	275	5418	0.025	60	2	15	1,953	2.91	10.19	8.86	242.84	3.24
1064	1065	275	240	5738	0.025	60	2	15	1,967	3.18	9.32	10.26	253.10	3.37
1065	1066	240	213	6295	0.030	85	2	15	1,987	3.24	6.71	15.63	268.73	3.58
1066	1067	213	176	6201	0.030	85	2	15	2,067	3.00	7.56	13.67	282.40	3.77
1067	1068	176	133	6324	0.030	85	2	15	2,141	2.95	7.98	13.21	295.61	3.94

## Losses

Node E1063  
 Total Area (ac) 49,892.0  
 24-Hour Rainfall Depth (in) 2.03  
 Fm (in/hr) 0.59  
 Y-Bar 0.73

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	1.7	1.9	0.0	0.0	19.1	77.3	163.8	234.9
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	4.4	0.0	0.0	0.6	15.2	3.6	49.7	28.8
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	6.2	8.9	3.6
Barren (Poor)	100	78	86	91	93	0.0	0.0	1.8	0.1	7.1	7.8	78.2	121.6
Chaparral, Broadleaf (Fair)	100	40	63	75	81	79.8	7.5	679.9	421.3	418.5	739.1	#####	9,918.9
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	58.2	140.7	49.6	41.5	2,575.2	6,194.4
Grass (Fair)	100	50	69	79	84	8.0	5.6	161.4	55.7	72.3	76.4	550.8	1,066.2
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Open Brush (Fair)	100	46	66	77	83	110.1	16.3	1,099.4	270.3	498.0	304.6	5,075.5	4,833.8
Woodland (Fair)	100	36	60	73	79	56.9	23.7	196.5	40.4	758.8	415.1	1,508.6	2,087.8
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	6.4	6.1	0.0	0.0	8.6	6.1	0.0	0.2
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	1.3	10.0	87.0	57.8

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.25	0.43	0.59	0.66
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.05	0.19	0.31
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.01	0.15	0.31	0.43
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.11	0.27	0.38
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.12	0.29	0.38
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.02	0.14	0.25
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.08	0.23	0.35
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.03	0.16	0.27
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.23	0.43	0.59	0.70
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.23	0.33
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.11	0.27	0.38
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.23	0.33

## Losses

Node E1064  
 Total Area (ac) 51,226.7  
 24-Hour Rainfall Depth (in) 2.01  
 Fm (in/hr) 0.59  
 Y-Bar 0.73

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	1.3	5.6	0.4	4.4	20.4	82.9	164.2	239.3
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	1.7	0.5	0.4	5.2	16.9	4.1	50.1	34.0
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	7.9	0.0	6.2	8.9	11.5
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	7.1	7.8	78.2	121.6
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.6	22.2	236.4	139.9	419.1	761.3	#####	#####
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	4.0	1.5	49.6	41.5	2,579.2	6,195.9
Grass (Fair)	100	50	69	79	84	1.3	65.2	74.3	97.6	73.6	141.6	625.1	1,163.8
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Open Brush (Fair)	100	46	66	77	83	0.5	30.2	195.5	191.8	498.5	334.8	5,271.0	5,025.6
Woodland (Fair)	100	36	60	73	79	8.2	13.4	61.9	56.5	767.0	428.5	1,570.5	2,144.3
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.9	2.3	0.0	0.0	9.5	8.4	0.0	0.2
Pasture, Dryland (Fair)	100	49	69	79	84	15.3	19.1	8.6	17.1	15.3	19.1	8.6	17.1
Turf (Fair)	100	44	65	77	82	18.9	18.5	0.0	5.6	20.2	28.5	87.0	63.4

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.24	0.43	0.58	0.66
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.05	0.19	0.30
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.01	0.15	0.30	0.43
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.11	0.26	0.37
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.12	0.28	0.37
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.02	0.13	0.24
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.08	0.23	0.35
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.03	0.16	0.26
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.23	0.43	0.58	0.70
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.23	0.33
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.11	0.26	0.37
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.23	0.33

## Losses

Node E1065  
 Total Area (ac) 53,123.3  
 24-Hour Rainfall Depth (in) 1.99  
 Fm (in/hr) 0.59  
 Y-Bar 0.73

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.9	3.9	4.0	0.4	21.3	86.8	168.2	239.7
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	20.3	15.0	9.6	12.6	37.2	19.1	59.7	46.6
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	10.9	47.0	4.5	0.0	17.1	55.9	16.0
Barren (Poor)	100	78	86	91	93	0.9	9.7	14.7	21.4	8.0	17.5	92.9	143.0
Chaparral, Broadleaf (Fair)	100	40	63	75	81	3.8	8.9	210.4	22.0	422.9	770.2	#####	#####
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	60.4	70.4	49.6	41.5	2,639.6	6,266.3
Grass (Fair)	100	50	69	79	84	29.3	61.8	145.3	136.7	102.9	203.4	770.4	1,300.5
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	10.0	0.0	0.0	0.0	10.2
Open Brush (Fair)	100	46	66	77	83	3.3	56.2	350.8	93.7	501.8	391.0	5,621.8	5,119.3
Woodland (Fair)	100	36	60	73	79	9.8	65.2	210.2	68.2	776.8	493.7	1,780.7	2,212.5
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	30.2	6.5	10.2	9.5	38.6	6.5	10.4
Pasture, Dryland (Fair)	100	49	69	79	84	47.1	0.7	0.4	3.8	62.4	19.8	9.0	20.9
Turf (Fair)	100	44	65	77	82	0.8	0.7	0.7	3.3	21.0	29.2	87.7	66.7

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.24	0.42	0.58	0.66
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.05	0.19	0.30
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.01	0.14	0.30	0.42
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.11	0.26	0.37
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.12	0.28	0.37
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.02	0.13	0.24
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.08	0.22	0.35
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.03	0.16	0.26
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.22	0.42	0.58	0.70
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.22	0.32
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.11	0.26	0.37
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.22	0.32

## Losses

Node E1066  
 Total Area (ac) 61,426.9  
 24-Hour Rainfall Depth (in) 1.92  
 Fm (in/hr) 0.59  
 Y-Bar 0.74

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	17.3	352.9	417.2	35.2	38.6	439.7	585.4	274.9
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	17.6	179.5	233.1	13.3	54.8	198.6	292.8	59.9
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	19.8	22.2	1.5	46.7	19.8	39.3	57.4	62.7
Barren (Poor)	100	78	86	91	93	67.4	235.2	196.3	33.6	75.4	252.7	289.2	176.6
Chaparral, Broadleaf (Fair)	100	40	63	75	81	3.6	104.1	277.7	154.4	426.5	874.3	#####	#####
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	2.4	29.0	20.2	49.6	43.9	2,668.6	6,286.5
Grass (Fair)	100	50	69	79	84	59.4	338.3	706.7	223.8	162.3	541.7	1,477.1	1,524.3
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.4	28.0	4.0	1.6	0.4	28.0	4.0	11.8
Open Brush (Fair)	100	46	66	77	83	9.3	151.0	1,739.1	420.0	511.1	542.0	7,360.9	5,539.3
Woodland (Fair)	100	36	60	73	79	108.3	259.4	359.5	83.0	885.1	753.1	2,140.2	2,295.5
Fallow (Poor)	100	77	86	91	94	2.2	0.0	90.5	38.9	2.2	2.7	90.5	38.9
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	37.7	12.4	87.2	9.5	76.3	18.9	97.6
Pasture, Dryland (Fair)	100	49	69	79	84	69.8	215.1	258.4	281.4	132.2	234.9	267.4	302.3
Turf (Fair)	100	44	65	77	82	39.0	139.2	53.8	6.0	60.0	168.4	141.5	72.7

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.10	0.18
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.10	0.18
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.10	0.18
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.10	0.18
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.10	0.18
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.23	0.41	0.57	0.65
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.04	0.18	0.29
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.00	0.14	0.29	0.41
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.10	0.25	0.36
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.11	0.27	0.36
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.02	0.12	0.23
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.07	0.21	0.33
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.02	0.15	0.25
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.21	0.41	0.57	0.69
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.06	0.21	0.31
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.10	0.25	0.36
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.06	0.21	0.31

## Losses

Node E1067  
 Total Area (ac) 66,611.2  
 24-Hour Rainfall Depth (in) 1.88  
 Fm (in/hr) 0.59  
 Y-Bar 0.74

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	6.2	10.8	2.7	38.6	445.9	596.2	277.6
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.0	77.2	0.0	59.0	54.8	275.8	292.8	118.9
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.2	0.0	0.1	19.8	39.5	57.4	62.8
Barren (Poor)	100	78	86	91	93	0.0	0.0	8.7	0.6	75.4	252.7	297.9	177.2
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	11.6	132.8	30.8	426.5	885.9	#####	#####
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	1.6	0.0	9.1	49.6	45.5	2,668.6	6,295.6
Grass (Fair)	100	50	69	79	84	0.9	47.2	379.3	444.7	163.2	588.9	1,856.4	1,969.0
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	1.8	0.2	0.6	0.4	29.8	4.2	12.4
Open Brush (Fair)	100	46	66	77	83	8.9	156.7	1,062.6	461.6	520.0	698.7	8,423.5	6,000.9
Woodland (Fair)	100	36	60	73	79	17.9	71.3	116.8	79.5	903.0	824.4	2,257.0	2,375.0
Fallow (Poor)	100	77	86	91	94	0.2	450.4	226.4	158.4	2.4	453.1	316.9	197.3
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	22.5	0.7	5.3	9.5	98.8	19.6	102.9
Pasture, Dryland (Fair)	100	49	69	79	84	5.5	529.8	206.0	368.4	137.7	764.7	473.4	670.7
Turf (Fair)	100	44	65	77	82	0.0	5.3	0.0	4.0	60.0	173.7	141.5	76.7

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.22	0.40	0.56	0.64
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.04	0.17	0.28
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.00	0.13	0.28	0.40
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.09	0.24	0.35
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.10	0.26	0.35
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.01	0.12	0.22
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.06	0.20	0.33
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.02	0.14	0.24
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.20	0.40	0.56	0.68
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.06	0.20	0.30
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.09	0.24	0.35
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.06	0.20	0.30

## Losses

Node E1068  
 Total Area (ac) 68,205.2  
 24-Hour Rainfall Depth (in) 1.87  
 Fm (in/hr) 0.58  
 Y-Bar 0.74

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	4.9	8.0	2.9	37.8	43.5	453.9	599.1	315.4
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5-7 Dwellings / Acre	50	32	56	69	75	0.2	19.0	0.0	142.9	55.0	294.8	292.8	261.8
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Public Park	85	32	56	69	75	0.0	0.4	0.7	0.0	19.8	39.9	58.1	62.8
Barren (Poor)	100	78	86	91	93	0.0	2.0	0.0	0.6	75.4	254.7	297.9	177.8
Chaparral, Broadleaf (Fair)	100	40	63	75	81	2.2	0.0	0.0	0.0	428.7	885.9	#####	#####
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	49.6	45.5	2,668.6	6,295.6
Grass (Fair)	100	50	69	79	84	6.2	20.9	222.2	421.5	169.4	609.8	2,078.6	2,390.5
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.4	29.8	4.2	12.4
Open Brush (Fair)	100	46	66	77	83	3.1	1.1	71.5	188.9	523.1	699.8	8,495.0	6,189.8
Woodland (Fair)	100	36	60	73	79	21.0	11.8	22.4	65.5	924.0	836.2	2,279.4	2,440.5
Fallow (Poor)	100	77	86	91	94	5.2	22.4	0.0	104.4	7.6	475.5	316.9	301.7
Orchards, Evergreen (Fair)	100	44	65	77	82	15.8	30.9	5.1	18.3	25.3	129.7	24.7	121.2
Pasture, Dryland (Fair)	100	49	69	79	84	31.6	65.8	0.0	9.8	169.3	830.5	473.4	680.5
Turf (Fair)	100	44	65	77	82	0.0	0.7	0.0	6.3	60.0	174.4	141.5	83.0

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.22	0.40	0.56	0.64
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.04	0.17	0.28
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.00	0.13	0.28	0.40
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.09	0.24	0.35
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.10	0.26	0.35
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.01	0.12	0.22
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.06	0.20	0.33
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.02	0.14	0.24
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.20	0.40	0.56	0.68
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.05	0.20	0.30
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.09	0.24	0.35
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.05	0.20	0.30

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LE63002E.FLD  
 TIME/DATE OF STUDY: 10:19 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1063.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 49892.000 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 3.120 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.020  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.150  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.640  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.190  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.590  
 LOW LOSS FRACTION = 0.730  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.15  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.30  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.41  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.77  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.14  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.03

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.343  
 30-MINUTE FACTOR = 0.394  
 1-HOUR FACTOR = 0.434  
 3-HOUR FACTOR = 0.784  
 6-HOUR FACTOR = 0.903  
 24-HOUR FACTOR = 0.943

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.671

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.261	1576.741
2	0.784	3153.484
3	1.307	3153.483
4	1.827	3142.095
5	2.343	3113.227
6	2.891	3304.565
7	3.632	4470.249
8	4.405	4664.813
9	5.184	4700.872
10	5.989	4855.415
11	6.812	4968.159
12	7.829	6137.017
13	8.893	6419.199
14	10.041	6925.649
15	11.316	7693.945
16	12.608	7793.672
17	14.081	8887.708
18	15.619	9279.149
19	17.434	10956.048
20	19.181	10536.261
21	20.820	9894.864
22	22.939	12781.252
23	25.173	13484.335
24	27.079	11500.094
25	28.948	11276.010
26	30.513	9439.711
27	32.220	10303.707
28	33.975	10589.097
29	35.563	9582.671
30	37.017	8770.118
31	38.608	9602.466
32	40.274	10050.449
33	41.822	9338.320
34	43.349	9215.823
35	45.037	10183.741
36	46.900	11241.427
37	48.526	9810.955
38	50.046	9172.597
39	51.279	7436.895
40	52.417	6869.614
41	53.484	6435.924
42	54.527	6291.537
43	55.405	5300.556
44	56.226	4955.206
45	57.228	6041.271
46	58.119	5376.352
47	58.803	4129.811
48	59.490	4142.539
49	60.168	4094.341
50	60.841	4058.089
51	61.516	4073.349
52	62.192	4080.784
53	62.901	4276.384
54	63.467	3417.590
55	64.038	3446.569
56	64.725	4144.610
57	65.336	3682.932
58	65.795	2773.523
59	66.309	3096.915
60	66.828	3131.625
61	67.333	3049.177
62	67.853	3138.161



63	68.353	3017.920
64	68.793	2651.210
65	69.231	2643.292
66	69.690	2771.038
67	70.116	2571.110
68	70.522	2446.726
69	70.928	2454.045
70	71.334	2446.265
71	71.735	2419.519
72	72.123	2341.491
73	72.492	2228.845
74	72.859	2210.109
75	73.234	2266.455
76	73.608	2254.256
77	73.949	2060.543
78	74.291	2062.109
79	74.632	2056.631
80	74.972	2054.421
81	75.315	2065.791
82	75.645	1990.939
83	75.973	1979.155
84	76.284	1877.787
85	76.571	1735.265
86	76.859	1734.943
87	77.146	1733.377
88	77.428	1700.141
89	77.695	1612.537
90	77.960	1599.970
91	78.224	1590.256
92	78.470	1481.708
93	78.711	1455.054
94	78.954	1464.951
95	79.210	1547.353
96	79.461	1514.668
97	79.698	1430.379
98	79.936	1433.878
99	80.172	1423.244
100	80.397	1361.926
101	80.618	1331.636
102	80.839	1332.280
103	81.060	1334.858
104	81.279	1322.935
105	81.497	1313.774
106	81.713	1304.844
107	81.928	1294.532
108	82.137	1262.768
109	82.333	1184.049
110	82.522	1139.995
111	82.711	1139.442
112	82.901	1142.665
113	83.088	1128.808
114	83.269	1092.948
115	83.450	1092.579
116	83.631	1093.408
117	83.812	1091.520
118	83.987	1058.053
119	84.160	1041.021
120	84.327	1008.474
121	84.493	1004.792
122	84.660	1003.457
123	84.826	1002.766
124	84.993	1005.528
125	85.159	1003.641
126	85.325	1004.792
127	85.492	1006.311
128	85.659	1003.457
129	85.823	993.421
130	85.981	951.162

131	86.119	836.398
132	86.248	777.428
133	86.378	780.328
134	86.507	780.604
135	86.636	775.403
136	86.765	780.558
137	86.893	776.093
138	87.022	776.922
139	87.151	779.638
140	87.280	776.922
141	87.409	778.257
142	87.538	777.750
143	87.667	776.093
144	87.793	763.618
145	87.906	681.677
146	88.015	656.404
147	88.123	648.900
148	88.230	645.079
149	88.338	652.399
150	88.446	651.524

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 5812.6660  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1900.5004  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	500.0	1000.0	1500.0	2000.0
14.000	501.5436	1012.04	.	V	Q	.	.
14.083	508.6765	1035.69	.	V	Q	.	.
14.167	515.9735	1059.53	.	V	.Q	.	.
14.250	523.4420	1084.43	.	.V	.Q	.	.
14.333	531.0840	1109.63	.	.V	.Q	.	.
14.417	538.8906	1133.51	.	.V	.Q	.	.
14.500	546.8564	1156.64	.	.V	.Q	.	.
14.583	555.0008	1182.57	.	.V	.Q	.	.
14.667	563.3290	1209.26	.	.V	.Q	.	.
14.750	571.8346	1235.01	.	.V	.Q	.	.
14.833	580.5172	1260.71	.	.V	.Q	.	.
14.917	589.3854	1287.66	.	.V	.Q	.	.
15.000	598.4596	1317.57	.	.V	.Q	.	.
15.083	607.7289	1345.91	.	.V	.Q	.	.
15.167	617.1915	1373.96	.	.V	.Q	.	.
15.250	626.8386	1400.76	.	.V	.Q	.	.
15.333	636.6639	1426.64	.	.V	.Q	.	.
15.417	646.6509	1450.11	.	.V	.Q	.	.
15.500	656.7787	1470.56	.	.V	.Q	.	.
15.583	667.0581	1492.56	.	.V	.Q	.	.
15.667	677.4832	1513.72	.	.V	.Q	.	.
15.750	688.0526	1534.67	.	.V	.Q	.	.
15.833	698.7859	1558.49	.	.V	.Q	.	.
15.917	709.6752	1581.12	.	.V	.Q	.	.
16.000	720.7198	1603.67	.	.V	.Q	.	.
16.083	732.0235	1641.30	.	.V	.Q	.	.
16.167	743.5410	1672.34	.	.V	.Q	.	.
16.250	755.1573	1686.70	.	.V	.Q	.	.
16.333	766.8521	1698.07	.	.V	.Q	.	.
16.417	778.6356	1710.97	.	.V	.Q	.	.
16.500	790.5319	1727.34	.	.V	.Q	.	.
16.583	802.5984	1752.06	.	.V	.Q	.	.
16.667	814.7720	1767.59	.	.V	.Q	.	.
16.750	827.0153	1777.72	.	.V	.Q	.	.
16.833	839.3300	1788.09	.	.V	.Q	.	.
16.917	851.7292	1800.36	.	.V	.Q	.	.
17.000	864.3053	1826.05	.	.V	.Q	.	.
17.083	876.9768	1839.90	.	.V	.Q	.	.
17.167	889.6983	1847.16	.	.V	.Q	.	.
17.250	902.4526	1851.93	.	.V	.Q	.	.
17.333	915.2437	1857.26	.	.V	.Q	.	.
17.417	928.1484	1873.78	.	.V	.Q	.	.
17.500	941.1414	1886.58	.	.V	.Q	.	.
17.583	954.2575	1904.45	.	.V	.Q	.	.
17.667	967.3547	1901.71	.	.V	.Q	.	.
17.750	980.4892	1907.13	.	.V	.Q	.	.
17.833	993.8788	1944.17	.	.V	.Q	.	.
17.917	1007.3264	1952.59	.	.V	.Q	.	.
18.000	1020.6207	1930.34	.	.V	.Q	.	.
18.083	1033.8618	1922.60	.	.V	.Q	.	.
18.167	1046.9882	1905.95	.	.V	.Q	.	.
18.250	1060.1730	1914.43	.	.V	.Q	.	.
18.333	1073.3197	1908.90	.	.V	.Q	.	.
18.417	1086.3621	1893.76	.	.V	.Q	.	.
18.500	1099.3032	1879.05	.	.V	.Q	.	.
18.583	1112.2537	1880.41	.	.V	.Q	.	.

18.667	1125.1920	1878.65	.	.	.	.V	.	Q	Q	.
18.750	1138.0439	1866.10	.	.	.	.V	.	.	.	.
18.833	1150.8092	1853.51	.	.	.	.V	.	.	.	.
18.917	1163.5684	1852.62	.	.	.	.V	.	.	.	.
19.000	1176.3115	1850.31	.	.	.	.V	.	.	.	.
19.083	1188.8250	1816.94	.	.	.	.V	.	.	.	.
19.167	1201.1705	1792.58	.	.	.	.V	.	.	.	.
19.250	1213.2969	1760.75	.	.	.	.V	.	.	.	.
19.333	1225.2993	1742.75	.	.	.	.V	.	.	.	.
19.417	1237.1663	1723.09	.	.	.	.V	.	.	.	.
19.500	1248.9155	1706.00	.	.	.	.V	.	.	.	.
19.583	1260.4578	1675.92	.	.	.	.V	.	.	.	.
19.667	1271.8346	1651.91	.	.	.	.V	.	.	.	.
19.750	1283.1240	1639.22	.	.	.	.V	.	.	.	.
19.833	1294.1838	1605.89	.	.	.	.V	.	.	.	.
19.917	1304.9548	1563.96	.	.	.	.V	.	.	.	.
20.000	1315.5111	1532.77	.	.	.	.V	.	.	.	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Analysis prepared by:

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 FILE NAME: LE64002E.FLD  
 TIME/DATE OF STUDY: 12:56 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1064.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 51226.699 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 3.240 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.020  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.150  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.630  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.200  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.590  
 LOW LOSS FRACTION = 0.740  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.15  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.30  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.41  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.77  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.13  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.01

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.339  
 30-MINUTE FACTOR = 0.390  
 1-HOUR FACTOR = 0.430  
 3-HOUR FACTOR = 0.780  
 6-HOUR FACTOR = 0.901  
 24-HOUR FACTOR = 0.942

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.572

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.251	1554.536
2	0.753	3109.071
3	1.255	3109.072
4	1.755	3102.079
5	2.250	3066.188
6	2.760	3158.243
7	3.434	4177.782
8	4.179	4612.324
9	4.922	4606.181
10	5.687	4734.761
11	6.472	4866.287
12	7.341	5384.723
13	8.410	6617.534
14	9.366	5927.391
15	10.651	7958.788
16	11.797	7099.578
17	13.139	8315.090
18	14.569	8856.455
19	16.107	9527.642
20	17.896	11087.775
21	19.514	10023.951
22	21.145	10100.392
23	23.242	12993.062
24	25.374	13208.983
25	27.162	11079.657
26	28.966	11175.560
27	30.464	9275.508
28	32.109	10192.265
29	33.795	10446.035
30	35.367	9739.080
31	36.761	8636.557
32	38.259	9282.468
33	39.912	10238.018
34	41.389	9150.147
35	42.911	9429.347
36	44.417	9331.885
37	46.263	11436.703
38	47.872	9969.240
39	49.449	9768.385
40	50.730	7935.770
41	51.869	7054.333
42	52.935	6608.308
43	53.963	6365.149
44	54.921	5934.888
45	55.704	4854.155
46	56.575	5395.042
47	57.546	6014.815
48	58.336	4890.762
49	58.994	4076.443
50	59.656	4104.282
51	60.312	4065.595
52	60.961	4020.456
53	61.615	4052.337
54	62.270	4058.340
55	62.959	4268.720
56	63.507	3392.364
57	64.051	3367.030
58	64.707	4066.422
59	65.332	3869.844
60	65.771	2721.236
61	66.259	3022.934
62	66.761	3113.117

63	67.252	3040.044
64	67.738	3009.227
65	68.260	3238.608
66	68.689	2656.577
67	69.111	2614.936
68	69.538	2641.357
69	69.983	2759.569
70	70.373	2415.899
71	70.765	2428.094
72	71.157	2427.432
73	71.546	2412.260
74	71.931	2386.216
75	72.298	2272.636
76	72.653	2200.650
77	73.006	2186.281
78	73.373	2269.848
79	73.727	2195.829
80	74.056	2039.096
81	74.385	2037.961
82	74.714	2037.205
83	75.042	2030.399
84	75.372	2047.604
85	75.690	1969.520
86	76.006	1953.308
87	76.311	1893.753
88	76.589	1721.658
89	76.867	1721.847
90	77.144	1716.412
91	77.420	1707.573
92	77.681	1617.484
93	77.936	1580.097
94	78.191	1583.217
95	78.437	1520.117
96	78.669	1439.670
97	78.901	1439.103
98	79.139	1474.647
99	79.390	1551.076
100	79.625	1454.464
101	79.853	1416.935
102	80.082	1414.099
103	80.307	1396.895
104	80.523	1334.882
105	80.735	1316.921
106	80.948	1318.055
107	81.161	1317.772
108	81.372	1307.326
109	81.581	1297.022
110	81.789	1289.318
111	81.996	1279.628
112	82.198	1251.316
113	82.389	1184.577
114	82.571	1126.912
115	82.753	1127.999
116	82.935	1126.629
117	83.116	1125.636
118	83.292	1086.878
119	83.465	1076.196
120	83.639	1076.527
121	83.813	1078.701
122	83.985	1062.820
123	84.153	1040.463
124	84.315	1006.573
125	84.476	992.299
126	84.636	992.016
127	84.796	992.724
128	84.956	991.401
129	85.116	990.692
130	85.276	992.016

131	85.436	991.354
132	85.596	993.670
133	85.756	988.187
134	85.915	986.533
135	86.066	932.650
136	86.199	825.971
137	86.323	770.433
138	86.447	766.699
139	86.571	769.015
140	86.695	768.684
141	86.819	764.052
142	86.943	771.851
143	87.067	767.030
144	87.191	767.692
145	87.315	768.023
146	87.439	767.928
147	87.563	767.030
148	87.687	770.670
149	87.811	765.045
150	87.925	711.635

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 5983.2490  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1847.4341  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	475.0	950.0	1425.0	1900.0
14.000	481.4483	962.36	.	V	Q	.	.
14.083	488.2287	984.52	.	V	Q	.	.
14.167	495.1790	1009.18	.	V	.Q	.	.
14.250	502.2841	1031.66	.	V	.Q	.	.
14.333	509.5508	1055.12	.	.V	.Q	.	.
14.417	516.9809	1078.85	.	.V	.Q	.	.
14.500	524.5692	1101.83	.	.V	.Q	.	.
14.583	532.3179	1125.10	.	.V	.Q	.	.
14.667	540.2357	1149.67	.	.V	.Q	.	.
14.750	548.3299	1175.27	.	.V	.Q	.	.
14.833	556.5919	1199.64	.	.V	.Q	.	.
14.917	565.0249	1224.47	.	.V	.Q	.	.
15.000	573.6322	1249.78	.	.V	.Q	.	.
15.083	582.4427	1279.28	.	.V	.Q	.	.
15.167	591.4353	1305.73	.	.V	.Q	.	.
15.250	600.6284	1334.83	.	.V	.Q	.	.
15.333	609.9958	1360.15	.	.V	.Q	.	.
15.417	619.5201	1382.92	.	.V	.Q	.	.
15.500	629.1815	1402.83	.	.V	.Q	.	.
15.583	638.9861	1423.63	.	.V	.Q	.	.
15.667	648.9490	1446.62	.	.V	.Q	.	.
15.750	659.0467	1466.18	.	.V	.Q	.	.
15.833	669.2806	1485.97	.	.V	.Q	.	.
15.917	679.6837	1510.52	.	.V	.Q	.	.
16.000	690.2652	1536.44	.	.V	.Q	.	.
16.083	701.0953	1572.53	.	.V	.Q	.	.
16.167	712.1521	1605.44	.	.V	.Q	.	.
16.250	723.2986	1618.47	.	.V	.Q	.	.
16.333	734.5289	1630.65	.	.V	.Q	.	.
16.417	745.8497	1643.77	.	.V	.Q	.	.
16.500	757.3015	1662.80	.	.V	.Q	.	.
16.583	768.9038	1684.65	.	.V	.Q	.	.
16.667	780.6230	1701.63	.	.V	.Q	.	.
16.750	792.4227	1713.31	.	.V	.Q	.	.
16.833	804.3033	1725.06	.	.V	.Q	.	.
16.917	816.2769	1738.57	.	.V	.Q	.	.
17.000	828.3511	1753.18	.	.V	.Q	.	.
17.083	840.5897	1777.04	.	.V	.Q	.	.
17.167	852.8500	1780.19	.	.V	.Q	.	.
17.250	865.2496	1800.43	.	.V	.Q	.	.
17.333	877.5942	1792.44	.	.V	.Q	.	.
17.417	890.0665	1810.98	.	.V	.Q	.	.
17.500	902.6058	1820.71	.	.V	.Q	.	.
17.583	915.2480	1835.64	.	.V	.Q	.	.
17.667	927.9924	1850.49	.	.V	.Q	.	.
17.750	940.6929	1844.11	.	.V	.Q	.	.
17.833	953.4637	1854.33	.	.V	.Q	.	.
17.917	966.4803	1890.01	.	.V	.Q	.	.
18.000	979.5275	1894.45	.	.V	.Q	.	.
18.083	992.3932	1868.09	.	.V	.Q	.	.
18.167	1005.2255	1863.26	.	.V	.Q	.	.
18.250	1017.9351	1845.43	.	.V	.Q	.	.
18.333	1030.7184	1856.13	.	.V	.Q	.	.
18.417	1043.4487	1848.45	.	.V	.Q	.	.
18.500	1056.0887	1835.32	.	.V	.Q	.	.
18.583	1068.5991	1816.51	.	.V	.Q	.	.

18.667	1081.0972	1814.72	.	.	.V	.	.Q	.
18.750	1093.6053	1816.19	.	.	.V	.	.Q	.
18.833	1106.0045	1800.36	.	.	.V	.	.Q	.
18.917	1118.3435	1791.63	.	.	.V	.	.Q	.
19.000	1130.5958	1779.04	.	.	.V	.	.Q	.
19.083	1142.9100	1788.03	.	.	.V	.	.Q	.
19.167	1155.0227	1758.76	.	.	.V	.	.Q	.
19.250	1166.9918	1737.91	.	.	.V	.	.Q	.
19.333	1178.7229	1703.36	.	.	.V	.	.Q	.
19.417	1190.3195	1683.82	.	.	.V	.	.Q	.
19.500	1201.7893	1665.42	.	.	.V	.	.Q	.
19.583	1213.1453	1648.89	.	.	.V	.	.Q	.
19.667	1224.3381	1625.21	.	.	.V	.	.Q	.
19.750	1235.3320	1596.32	.	.	.V	.	.Q	.
19.833	1246.2279	1582.08	.	.	.V	.	.Q	.
19.917	1256.9758	1560.61	.	.	.V	.	.Q	.
20.000	1267.4679	1523.45	.	.	.V	.	.Q	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LE65002E.FLD  
 TIME/DATE OF STUDY: 12:57 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1065.00 IS CODE = 1

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 >>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<<  
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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 53123.301 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 3.380 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.020  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.150  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.610  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.220  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.590  
 LOW LOSS FRACTION = 0.740  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.15  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.30  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.41  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.76  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.12  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 1.99

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.332  
 30-MINUTE FACTOR = 0.384  
 1-HOUR FACTOR = 0.424  
 3-HOUR FACTOR = 0.774  
 6-HOUR FACTOR = 0.899  
 24-HOUR FACTOR = 0.941

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.465

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.239	1536.518
2	0.717	3073.036
3	1.196	3073.036
4	1.674	3069.755
5	2.146	3031.730
6	2.627	3091.836
7	3.215	3778.662
8	3.927	4576.405
9	4.633	4535.169
10	5.351	4615.068
11	6.095	4775.607
12	6.861	4925.225
13	7.814	6117.225
14	8.791	6276.838
15	9.807	6532.490
16	11.012	7736.434
17	12.132	7199.196
18	13.452	8480.494
19	14.824	8814.408
20	16.344	9766.693
21	18.054	10982.444
22	19.569	9733.179
23	21.149	10151.014
24	23.159	12917.724
25	25.191	13049.441
26	26.905	11016.939
27	28.651	11215.478
28	30.079	9175.452
29	31.652	10102.685
30	33.249	10260.552
31	34.863	10368.020
32	36.188	8515.148
33	37.585	8971.804
34	39.192	10327.704
35	40.643	9324.645
36	42.146	9652.314
37	43.529	8888.992
38	45.181	10607.486
39	46.926	11216.360
40	48.442	9735.593
41	49.892	9319.938
42	51.074	7593.872
43	52.157	6952.304
44	53.173	6531.307
45	54.169	6398.131
46	55.079	5848.982
47	55.831	4830.532
48	56.686	5493.838
49	57.624	6020.562
50	58.394	4948.072
51	59.033	4106.177
52	59.675	4127.327
53	60.309	4068.238
54	60.937	4039.589
55	61.569	4060.102
56	62.200	4051.892
57	62.873	4325.008
58	63.446	3679.077
59	63.952	3253.596
60	64.532	3725.005
61	65.194	4252.023
62	65.684	3147.795

63	66.117	2783.460
64	66.596	3079.075
65	67.078	3091.868
66	67.546	3010.011
67	68.027	3092.554
68	68.517	3145.932
69	68.924	2616.611
70	69.329	2599.945
71	69.741	2644.452
72	70.168	2747.189
73	70.542	2397.804
74	70.918	2418.097
75	71.294	2416.528
76	71.668	2404.176
77	72.038	2375.600
78	72.395	2293.891
79	72.737	2197.231
80	73.076	2180.566
81	73.419	2200.271
82	73.778	2304.870
83	74.094	2034.597
84	74.410	2028.813
85	74.726	2029.597
86	75.041	2022.294
87	75.357	2030.431
88	75.670	2014.255
89	75.971	1933.771
90	76.273	1934.409
91	76.556	1821.329
92	76.822	1707.024
93	77.089	1719.719
94	77.356	1713.740
95	77.620	1698.055
96	77.869	1598.896
97	78.114	1570.074
98	78.357	1565.516
99	78.594	1519.147
100	78.817	1431.213
101	79.039	1429.203
102	79.265	1453.760
103	79.506	1545.321
104	79.737	1484.738
105	79.956	1404.352
106	80.174	1402.587
107	80.392	1399.940
108	80.602	1350.876
109	80.806	1310.977
110	81.010	1308.232
111	81.213	1308.036
112	81.417	1309.359
113	81.618	1290.733
114	81.818	1284.753
115	82.016	1274.264
116	82.213	1265.588
117	82.405	1231.963
118	82.586	1159.763
119	82.760	1121.433
120	82.935	1120.893
121	83.109	1120.795
122	83.283	1117.707
123	83.451	1079.279
124	83.617	1063.937
125	83.783	1067.417
126	83.949	1068.447
127	84.114	1060.702
128	84.274	1025.068
129	84.432	1013.402
130	84.585	983.992

131	84.738	986.590
132	84.891	980.463
133	85.044	985.855
134	85.197	982.375
135	85.350	984.679
136	85.503	980.512
137	85.656	983.502
138	85.810	987.031
139	85.962	979.336
140	86.113	965.464
141	86.254	909.243
142	86.379	802.389
143	86.497	761.019
144	86.615	756.853
145	86.734	764.451
146	86.852	759.157
147	86.971	763.372
148	87.090	761.019
149	87.208	759.157
150	87.326	761.068

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 6133.1670  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1880.8191  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	500.0	1000.0	1500.0	2000.0
14.000	484.2559	963.96	.	V	Q.	.	.
14.083	491.0637	988.49	.	V	Q.	.	.
14.167	498.0390	1012.82	.	V	Q	.	.
14.250	505.1835	1037.37	.	V	Q	.	.
14.333	512.4800	1059.45	.	V	.Q	.	.
14.417	519.9357	1082.58	.	.V	.Q	.	.
14.500	527.5524	1105.94	.	.V	.Q	.	.
14.583	535.3375	1130.39	.	.V	.Q	.	.
14.667	543.2830	1153.69	.	.V	.Q	.	.
14.750	551.3918	1177.40	.	.V	.Q	.	.
14.833	559.6749	1202.71	.	.V	.Q	.	.
14.917	568.1251	1226.96	.	.V	.Q	.	.
15.000	576.7454	1251.68	.	.V	.Q	.	.
15.083	585.5404	1277.03	.	.V	.Q	.	.
15.167	594.5242	1304.45	.	.V	.Q	.	.
15.250	603.7027	1332.71	.	.V	.Q	.	.
15.333	613.0735	1360.65	.	.V	.Q	.	.
15.417	622.6060	1384.11	.	.V	.Q	.	.
15.500	632.2773	1404.27	.	.V	.Q	.	.
15.583	642.0874	1424.42	.	.V	.Q	.	.
15.667	652.0437	1445.66	.	.V	.Q	.	.
15.750	662.1544	1468.08	.	.V	.Q	.	.
15.833	672.3994	1487.57	.	.V	.Q	.	.
15.917	682.7769	1506.81	.	.V	.Q	.	.
16.000	693.3304	1532.37	.	.V	.Q	.	.
16.083	704.1624	1572.81	.	.V	.Q	.	.
16.167	715.2217	1605.82	.	.V	.Q	.	.
16.250	726.3916	1621.86	.	.V	.Q	.	.
16.333	737.6404	1633.33	.	.V	.Q	.	.
16.417	748.9785	1646.29	.	.V	.Q	.	.
16.500	760.4405	1664.28	.	.V	.Q	.	.
16.583	772.0660	1688.02	.	.V	.Q	.	.
16.667	783.8197	1706.64	.	.V	.Q	.	.
16.750	795.6583	1718.96	.	.V	.Q	.	.
16.833	807.5834	1731.53	.	.V	.Q	.	.
16.917	819.5965	1744.30	.	.V	.Q	.	.
17.000	831.7105	1758.96	.	.V	.Q	.	.
17.083	843.9547	1777.85	.	.V	.Q	.	.
17.167	856.2758	1789.03	.	.V	.Q	.	.
17.250	868.6823	1801.41	.	.V	.Q	.	.
17.333	881.1739	1813.79	.	.V	.Q	.	.
17.417	893.6608	1813.10	.	.V	.Q	.	.
17.500	906.2769	1831.86	.	.V	.Q	.	.
17.583	918.9544	1840.77	.	.V	.Q	.	.
17.667	931.7471	1857.50	.	.V	.Q	.	.
17.750	944.6237	1869.69	.	.V	.Q	.	.
17.833	957.4624	1864.18	.	.V	.Q	.	.
17.917	970.3777	1875.30	.	.V	.Q	.	.
18.000	983.5268	1909.25	.	.V	.Q	.	.
18.083	996.6980	1912.45	.	.V	.Q	.	.
18.167	1009.6946	1887.11	.	.V	.Q	.	.
18.250	1022.6538	1881.67	.	.V	.Q	.	.
18.333	1035.4846	1863.03	.	.V	.Q	.	.
18.417	1048.3971	1874.88	.	.V	.Q	.	.
18.500	1061.2662	1868.60	.	.V	.Q	.	.
18.583	1074.0682	1858.85	.	.V	.Q	.	.

18.667	1086.6830	1831.66	.	.	.V	.	Q	.
18.750	1099.2736	1828.15	.	.	.V	.	Q	.
18.833	1111.9025	1833.71	.	.	.V	.	Q	.
18.917	1124.4202	1817.57	.	.	.V	.	Q	.
19.000	1136.8728	1808.13	.	.	.V	.	Q	.
19.083	1149.2045	1790.55	.	.	.V	.	Q	.
19.167	1161.5863	1797.84	.	.	.V	.	Q	.
19.250	1173.9094	1789.31	.	.	.V	.	Q	.
19.333	1186.0388	1761.19	.	.	.V	.	Q	.
19.417	1198.0026	1737.13	.	.	.V	.	Q	.
19.500	1209.7476	1705.38	.	.	.V	.	Q	.
19.583	1221.3708	1687.70	.	.	.V	.	Q	.
19.667	1232.8785	1670.92	.	.	.V	.	Q	.
19.750	1244.2595	1652.53	.	.	.V	.	Q	.
19.833	1255.4686	1627.56	.	.	.V	.	Q	.
19.917	1266.4927	1600.69	.	.	.V	.	Q	.
20.000	1277.4004	1583.80	.	.	.V	.	Q	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LE66002E.FLD  
TIME/DATE OF STUDY: 12:59 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1066.00 IS CODE = 1

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>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 61426.898 ACRES  
BASEFLOW = 0.000 CFS/SQUARE-MILE  
\*USER ENTERED "LAG" TIME = 3.590 HOURS  
VALLEY(DEVELOPED):  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.020  
FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.140  
MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.620  
VALLEY(UNDEVELOPED)/DESERT:  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.220  
DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.590  
LOW LOSS FRACTION = 0.760  
\*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.15  
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.30  
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.40  
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.74  
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.09  
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 1.92

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
5-MINUTE FACTOR = 0.307  
30-MINUTE FACTOR = 0.362  
1-HOUR FACTOR = 0.407  
3-HOUR FACTOR = 0.753  
6-HOUR FACTOR = 0.891  
24-HOUR FACTOR = 0.936

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.321

RUNOFF HYDROGRAPH LISTING LIMITS:  
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.226	1680.710
2	0.679	3361.421
3	1.131	3361.422
4	1.584	3360.972
5	2.031	3324.873
6	2.482	3345.619
7	2.976	3670.486
8	3.635	4894.863
9	4.302	4961.965
10	4.974	4985.075
11	5.664	5125.703
12	6.373	5274.034
13	7.125	5581.413
14	8.070	7023.512
15	8.967	6663.600
16	9.977	7504.295
17	11.103	8360.471
18	12.160	7856.808
19	13.410	9281.039
20	14.706	9631.518
21	16.100	10353.892
22	17.732	12121.475
23	19.216	11028.296
24	20.613	10373.743
25	22.407	13331.055
26	24.342	14372.940
27	26.173	13601.590
28	27.743	11668.537
29	29.302	11577.669
30	30.675	10198.128
31	32.164	11060.871
32	33.685	11303.790
33	35.177	11078.611
34	36.412	9178.275
35	37.719	9711.439
36	39.223	11172.695
37	40.607	10276.145
38	41.979	10197.222
39	43.298	9794.047
40	44.716	10538.957
41	46.382	12373.688
42	47.810	10612.298
43	49.240	10620.460
44	50.449	8981.066
45	51.504	7833.889
46	52.491	7333.201
47	53.421	6907.355
48	54.348	6889.162
49	55.175	6146.972
50	55.862	5098.696
51	56.676	6047.106
52	57.552	6510.047
53	58.282	5425.837
54	58.878	4428.458
55	59.483	4491.483
56	60.077	4410.831
57	60.669	4400.799
58	61.258	4376.541
59	61.852	4407.175
60	62.452	4463.711
61	63.072	4599.623
62	63.557	3604.425

63	64.042	3602.102
64	64.624	4325.390
65	65.231	4508.288
66	65.652	3128.250
67	66.067	3082.285
68	66.517	3346.175
69	66.968	3345.325
70	67.407	3263.199
71	67.849	3287.967
72	68.328	3553.444
73	68.712	2851.325
74	69.091	2819.019
75	69.470	2818.055
76	69.879	3038.757
77	70.245	2714.166
78	70.597	2618.381
79	70.951	2624.559
80	71.304	2622.235
81	71.654	2602.058
82	72.000	2571.679
83	72.330	2452.713
84	72.650	2379.316
85	72.969	2363.163
86	73.289	2380.903
87	73.627	2507.350
88	73.925	2218.635
89	74.222	2206.563
90	74.519	2206.960
91	74.816	2206.110
92	75.112	2198.005
93	75.410	2215.745
94	75.696	2123.871
95	75.979	2101.540
96	76.260	2082.950
97	76.514	1887.130
98	76.765	1864.969
99	77.015	1862.928
100	77.266	1863.155
101	77.513	1834.306
102	77.746	1729.906
103	77.975	1701.795
104	78.204	1702.361
105	78.428	1661.837
106	78.638	1560.781
107	78.847	1555.170
108	79.058	1562.085
109	79.281	1655.772
110	79.505	1667.731
111	79.713	1545.648
112	79.918	1524.224
113	80.124	1525.245
114	80.327	1510.962
115	80.522	1445.046
116	80.713	1424.359
117	80.905	1424.869
118	81.097	1422.205
119	81.288	1421.922
120	81.477	1405.939
121	81.665	1393.923
122	81.852	1389.899
123	82.037	1377.997
124	82.219	1350.168
125	82.393	1289.523
126	82.557	1223.041
127	82.722	1220.037
128	82.886	1222.927
129	83.050	1216.069
130	83.212	1202.864

131	83.368	1163.530
132	83.524	1156.445
133	83.681	1164.947
134	83.837	1157.749
135	83.992	1151.457
136	84.143	1126.123
137	84.292	1101.184
138	84.436	1073.696
139	84.581	1072.732
140	84.725	1072.676
141	84.870	1074.149
142	85.014	1072.676
143	85.158	1072.789
144	85.302	1070.239
145	85.447	1077.437
146	85.591	1068.028
147	85.736	1077.437
148	85.880	1066.101
149	86.019	1033.285
150	86.148	961.361

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 6993.0049  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1901.4429  
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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.	500.0	1000.0	1500.0	2000.0
14.000	478.8616	959.05	.	V	Q.	.	.
14.083	485.6317	983.03	.	V	Q.	.	.
14.167	492.5891	1010.20	.	V	Q	.	.
14.250	499.7271	1036.45	.	V	Q	.	.
14.333	507.0300	1060.38	.	V	.Q	.	.
14.417	514.4966	1084.15	.	V	.Q	.	.
14.500	522.1157	1106.28	.	V	.Q	.	.
14.583	529.8964	1129.77	.	.V	.Q	.	.
14.667	537.8503	1154.90	.	.V	.Q	.	.
14.750	545.9753	1179.76	.	.V	.Q	.	.
14.833	554.2556	1202.30	.	.V	.Q	.	.
14.917	562.6959	1225.53	.	.V	.Q	.	.
15.000	571.3079	1250.46	.	.V	.Q	.	.
15.083	580.0860	1274.59	.	.V	.Q	.	.
15.167	589.0399	1300.10	.	.V	.Q	.	.
15.250	598.1620	1324.53	.	.V	.Q	.	.
15.333	607.4629	1350.49	.	.V	.Q	.	.
15.417	616.9429	1376.51	.	.V	.Q	.	.
15.500	626.5628	1396.80	.	.V	.Q	.	.
15.583	636.3362	1419.10	.	.V	.Q	.	.
15.667	646.2545	1440.14	.	.V	.Q	.	.
15.750	656.3130	1460.49	.	.V	.Q	.	.
15.833	666.5204	1482.11	.	.V	.Q	.	.
15.917	676.8715	1502.97	.	.V	.Q	.	.
16.000	687.3660	1523.80	.	.V	.Q	.	.
16.083	698.1107	1560.14	.	.V	.Q	.	.
16.167	709.0858	1593.58	.	.V	.Q	.	.
16.250	720.1891	1612.19	.	.V	.Q	.	.
16.333	731.3951	1627.12	.	.V	.Q	.	.
16.417	742.7053	1642.24	.	.V	.Q	.	.
16.500	754.1136	1656.48	.	.V	.Q	.	.
16.583	765.6562	1675.98	.	.V	.Q	.	.
16.667	777.3650	1700.12	.	.V	.Q	.	.
16.750	789.1614	1712.84	.	.V	.Q	.	.
16.833	801.0319	1723.59	.	.V	.Q	.	.
16.917	812.9765	1734.36	.	.V	.Q	.	.
17.000	825.0258	1749.55	.	.V	.Q	.	.
17.083	837.1680	1763.06	.	.V	.Q	.	.
17.167	849.4150	1778.26	.	.V	.Q	.	.
17.250	861.6877	1782.00	.	.V	.Q	.	.
17.333	874.0696	1797.86	.	.V	.Q	.	.
17.417	886.5377	1810.37	.	.V	.Q	.	.
17.500	899.0081	1810.69	.	.V	.Q	.	.
17.583	911.5890	1826.75	.	.V	.Q	.	.
17.667	924.2434	1837.42	.	.V	.Q	.	.
17.750	936.9839	1849.93	.	.V	.Q	.	.
17.833	949.8424	1867.05	.	.V	.Q	.	.
17.917	962.6785	1863.80	.	.V	.Q	.	.
18.000	975.5490	1868.80	.	.V	.Q	.	.
18.083	988.6097	1896.41	.	.V	.Q	.	.
18.167	1001.7371	1906.10	.	.V	.Q	.	.
18.250	1014.8063	1897.65	.	.V	.Q	.	.
18.333	1027.7273	1876.13	.	.V	.Q	.	.
18.417	1040.6249	1872.72	.	.V	.Q	.	.
18.500	1053.4659	1864.52	.	.V	.Q	.	.
18.583	1066.3556	1871.58	.	.V	.Q	.	.

18.667	1079.2020	1865.31	.	.	.V	.	Q	.
18.750	1091.9449	1850.27	.	.	.V	.	Q	.
18.833	1104.5100	1824.45	.	.	.V	.	Q	.
18.917	1117.0516	1821.04	.	.	.V	.	Q	.
19.000	1129.6271	1825.96	.	.	.V	.	Q	.
19.083	1142.0935	1810.13	.	.	.V	.	Q	.
19.167	1154.4525	1794.54	.	.	.V	.	Q	.
19.250	1166.7151	1780.53	.	.	.V	.	Q	.
19.333	1178.9691	1779.28	.	.	.V	.	Q	.
19.417	1191.2355	1781.08	.	.	.V	.	Q	.
19.500	1203.3291	1755.99	.	.	.V	.	Q	.
19.583	1215.2892	1736.60	.	.	.V	.	Q	.
19.667	1227.0234	1703.82	.	.	.V	.	Q	.
19.750	1238.5996	1680.86	.	.	.V	.	Q	.
19.833	1250.0540	1663.18	.	.	.V	.	Q	.
19.917	1261.3960	1646.86	.	.	.V	.	Q	.
20.000	1272.6182	1629.45	.	.	.V	.	Q	.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

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FILE NAME: LE67002E.FLD  
TIME/DATE OF STUDY: 12:59 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1067.00 IS CODE = 1

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>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 66611.203 ACRES  
BASEFLOW = 0.000 CFS/SQUARE-MILE  
\*USER ENTERED "LAG" TIME = 3.770 HOURS  
VALLEY(DEVELOPED):  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.020  
FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.140  
MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.620  
VALLEY(UNDEVELOPED)/DESERT:  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.220  
DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.590  
LOW LOSS FRACTION = 0.760  
\*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.15  
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.29  
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.40  
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.73  
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.07  
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 1.88

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
5-MINUTE FACTOR = 0.293  
30-MINUTE FACTOR = 0.352  
1-HOUR FACTOR = 0.397  
3-HOUR FACTOR = 0.740  
6-HOUR FACTOR = 0.887  
24-HOUR FACTOR = 0.933

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.210

RUNOFF HYDROGRAPH LISTING LIMITS:  
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.215	1735.541
2	0.646	3471.079
3	1.077	3471.083
4	1.508	3471.076
5	1.936	3444.648
6	2.362	3431.208
7	2.805	3568.157
8	3.392	4733.944
9	4.032	5152.258
10	4.668	5125.437
11	5.314	5206.957
12	5.981	5373.941
13	6.663	5489.526
14	7.442	6278.737
15	8.370	7474.146
16	9.176	6490.093
17	10.244	8608.602
18	11.265	8219.631
19	12.299	8331.060
20	13.497	9655.548
21	14.734	9963.190
22	16.057	10659.933
23	17.614	12538.852
24	19.044	11523.350
25	20.359	10590.282
26	21.986	13109.438
27	23.828	14839.191
28	25.645	14630.501
29	27.146	12092.216
30	28.743	12867.190
31	30.009	10203.018
32	31.413	11308.897
33	32.833	11436.751
34	34.333	12087.775
35	35.591	10132.276
36	36.814	9852.660
37	38.081	10206.859
38	39.538	11738.586
39	40.812	10262.850
40	42.146	10741.998
41	43.381	9948.632
42	44.745	10989.562
43	46.337	12824.721
44	47.703	11006.956
45	49.069	11001.548
46	50.259	9584.999
47	51.278	8210.150
48	52.231	7674.428
49	53.132	7258.307
50	54.017	7132.989
51	54.847	6681.251
52	55.555	5705.869
53	56.242	5538.634
54	57.067	6639.919
55	57.876	6521.761
56	58.491	4952.205
57	59.062	4598.222
58	59.634	4611.774
59	60.200	4558.333
60	60.763	4532.182
61	61.325	4527.726
62	61.889	4549.914

63	62.462	4613.894
64	63.056	4779.654
65	63.519	3734.851
66	63.977	3687.465
67	64.515	4334.001
68	65.107	4769.113
69	65.550	3569.398
70	65.929	3050.546
71	66.352	3408.617
72	66.782	3469.770
73	67.205	3403.946
74	67.621	3351.274
75	68.071	3621.271
76	68.481	3308.313
77	68.844	2919.635
78	69.205	2910.108
79	69.569	2931.742
80	69.962	3163.327
81	70.299	2721.239
82	70.636	2711.037
83	70.972	2711.713
84	71.308	2705.997
85	71.642	2686.514
86	71.972	2659.102
87	72.289	2551.361
88	72.594	2458.801
89	72.897	2442.084
90	73.200	2437.597
91	73.523	2602.558
92	73.816	2359.051
93	74.099	2281.917
94	74.382	2278.721
95	74.665	2280.934
96	74.946	2264.401
97	75.230	2288.248
98	75.511	2261.143
99	75.781	2174.607
100	76.050	2171.165
101	76.314	2123.717
102	76.552	1917.823
103	76.791	1930.607
104	77.030	1921.757
105	77.269	1926.735
106	77.505	1897.295
107	77.727	1788.264
108	77.945	1758.947
109	78.163	1757.779
110	78.379	1737.743
111	78.580	1622.197
112	78.780	1608.552
113	78.979	1603.451
114	79.185	1663.314
115	79.402	1748.007
116	79.606	1643.216
117	79.802	1576.163
118	79.998	1579.789
119	80.193	1572.106
120	80.385	1541.929
121	80.568	1479.423
122	80.751	1470.204
123	80.934	1471.126
124	81.116	1470.143
125	81.298	1466.762
126	81.478	1450.291
127	81.657	1442.485
128	81.835	1431.668
129	82.012	1429.148
130	82.186	1396.636

131	82.354	1354.965
132	82.511	1269.104
133	82.668	1258.164
134	82.824	1258.226
135	82.980	1262.159
136	83.136	1254.231
137	83.287	1215.142
138	83.436	1197.994
139	83.585	1198.547
140	83.732	1191.910
141	83.883	1210.348
142	84.028	1169.722
143	84.172	1161.302
144	84.312	1130.326
145	84.450	1109.859
146	84.587	1103.283
147	84.725	1114.285
148	84.863	1108.261
149	85.000	1103.898
150	85.137	1105.373

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 7402.7007  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1989.2224  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	500.0	1000.0	1500.0	2000.0
14.000	493.6049	988.03	.	V.	Q.	.	.
14.083	500.5533	1008.91	.	V	Q	.	.
14.167	507.6793	1034.70	.	V	Q	.	.
14.250	514.9962	1062.42	.	V	.Q	.	.
14.333	522.5022	1089.87	.	V	.Q	.	.
14.417	530.1760	1114.24	.	V	.Q	.	.
14.500	538.0237	1139.49	.	V	.Q	.	.
14.583	546.0245	1161.70	.	V	.Q	.	.
14.667	554.1957	1186.46	.	.V	.Q	.	.
14.750	562.5407	1211.70	.	.V	.Q	.	.
14.833	571.0639	1237.56	.	.V	.Q	.	.
14.917	579.7491	1261.09	.	.V	.Q	.	.
15.000	588.5946	1284.37	.	.V	.Q	.	.
15.083	597.6030	1308.02	.	.V	.Q	.	.
15.167	606.7914	1334.17	.	.V	.Q	.	.
15.250	616.1556	1359.68	.	.V	.Q	.	.
15.333	625.6904	1384.44	.	.V	.Q	.	.
15.417	635.3856	1407.74	.	.V	.Q	.	.
15.500	645.2283	1429.17	.	.V	.Q	.	.
15.583	655.2355	1453.04	.	.V	.Q	.	.
15.667	665.4048	1476.59	.	.V	.Q	.	.
15.750	675.7333	1499.70	.	.V	.Q	.	.
15.833	686.2117	1521.45	.	.V	.Q	.	.
15.917	696.8514	1544.89	.	.V	.Q	.	.
16.000	707.6487	1567.77	.	.V	.Q	.	.
16.083	718.6766	1601.25	.	.V	.Q	.	.
16.167	729.9359	1634.84	.	.V	.Q	.	.
16.250	741.3364	1655.36	.	.V	.Q	.	.
16.333	752.8578	1672.90	.	.V	.Q	.	.
16.417	764.4872	1688.59	.	.V	.Q	.	.
16.500	776.2563	1708.86	.	.V	.Q	.	.
16.583	788.1484	1726.73	.	.V	.Q	.	.
16.667	800.2183	1752.55	.	.V	.Q	.	.
16.750	812.3977	1768.45	.	.V	.Q	.	.
16.833	824.6704	1782.00	.	.V	.Q	.	.
16.917	837.0247	1793.84	.	.V	.Q	.	.
17.000	849.4678	1806.75	.	.V	.Q	.	.
17.083	861.9925	1818.58	.	.V	.Q	.	.
17.167	874.6265	1834.46	.	.V	.Q	.	.
17.250	887.3555	1848.26	.	.V	.Q	.	.
17.333	900.0954	1849.83	.	.V	.Q	.	.
17.417	912.9911	1872.46	.	.V	.Q	.	.
17.500	925.8998	1874.34	.	.V	.Q	.	.
17.583	938.8682	1883.02	.	.V	.Q	.	.
17.667	951.9333	1897.05	.	.V	.Q	.	.
17.750	965.0901	1910.37	.	.V	.Q	.	.
17.833	978.3242	1921.59	.	.V	.Q	.	.
17.917	991.6833	1939.76	.	.V	.Q	.	.
18.000	1005.0222	1936.80	.	.V	.Q	.	.
18.083	1018.3690	1937.96	.	.V	.Q	.	.
18.167	1031.8671	1959.93	.	.V	.Q	.	.
18.250	1045.4795	1976.53	.	.V	.Q	.	.
18.333	1059.0743	1973.98	.	.V	.Q	.	.
18.417	1072.5011	1949.57	.	.V	.Q	.	.
18.500	1085.9335	1950.39	.	.V	.Q	.	.
18.583	1099.2557	1934.39	.	.V	.Q	.	.

18.667	1112.6388	1943.22	.	.	.V	.	Q.
18.750	1125.9907	1938.71	.	.	.V	.	Q.
18.833	1139.3107	1934.06	.	.	.V	.	Q.
18.917	1152.4192	1903.35	.	.	.V	.	Q.
19.000	1165.4532	1892.54	.	.	.V	.	Q.
19.083	1178.4561	1888.01	.	.	.V	.	Q.
19.167	1191.4636	1888.70	.	.	.V	.	Q.
19.250	1204.2902	1862.41	.	.	.V	.	Q.
19.333	1217.0521	1853.04	.	.	.V	.	Q.
19.417	1229.6943	1835.65	.	.	.V	.	Q.
19.500	1242.3251	1833.99	.	.	.V	.	Q.
19.583	1254.9714	1836.26	.	.	.V	.	Q.
19.667	1267.4386	1810.23	.	.	.V	.	Q.
19.750	1279.7850	1792.70	.	.	.V	.	Q.
19.833	1291.9114	1760.74	.	.	.V	.	Q.
19.917	1303.8528	1733.88	.	.	.V	.	Q.
20.000	1315.6714	1716.06	.	.	.V	.	Q.

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END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

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FILE NAME: LE68002E.FLD  
TIME/DATE OF STUDY: 13:00 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1068.00 IS CODE = 1

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>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 68205.203 ACRES  
BASEFLOW = 0.000 CFS/SQUARE-MILE  
\*USER ENTERED "LAG" TIME = 3.950 HOURS  
VALLEY(DEVELOPED):  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.020  
FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.140  
MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.610  
VALLEY(UNDEVELOPED)/DESERT:  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.230  
DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.580  
LOW LOSS FRACTION = 0.760  
\*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.15  
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.29  
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.40  
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.73  
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.06  
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 1.87

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
5-MINUTE FACTOR = 0.289  
30-MINUTE FACTOR = 0.350  
1-HOUR FACTOR = 0.393  
3-HOUR FACTOR = 0.736  
6-HOUR FACTOR = 0.885  
24-HOUR FACTOR = 0.932

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.110

RUNOFF HYDROGRAPH LISTING LIMITS:  
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.205	1691.257
2	0.615	3382.514
3	1.025	3382.514
4	1.435	3382.517
5	1.843	3366.625
6	2.247	3332.124
7	2.663	3425.383
8	3.163	4123.412
9	3.776	5056.229
10	4.380	4983.020
11	4.988	5020.763
12	5.613	5156.428
13	6.257	5306.421
14	6.917	5444.772
15	7.737	6763.484
16	8.605	7158.474
17	9.371	6323.088
18	10.450	8897.831
19	11.383	7699.252
20	12.396	8354.905
21	13.539	9428.651
22	14.717	9717.673
23	15.973	10353.045
24	17.456	12235.690
25	18.833	11356.646
26	20.088	10352.133
27	21.542	11997.541
28	23.292	14433.040
29	25.046	14468.801
30	26.576	12615.655
31	28.047	12138.461
32	29.379	10987.254
33	30.651	10492.910
34	32.004	11162.109
35	33.376	11315.536
36	34.804	11773.584
37	35.916	9176.587
38	37.106	9813.014
39	38.373	10450.133
40	39.764	11475.980
41	40.959	9854.895
42	42.253	10677.190
43	43.421	9629.883
44	44.742	10901.037
45	46.278	12667.684
46	47.598	10886.469
47	48.905	10779.737
48	50.081	9708.139
49	51.077	8209.423
50	52.003	7641.780
51	52.884	7262.208
52	53.726	6944.782
53	54.562	6896.481
54	55.300	6090.706
55	55.920	5112.466
56	56.665	6143.442
57	57.466	6613.290
58	58.176	5849.741
59	58.728	4558.228
60	59.280	4552.753
61	59.826	4500.740
62	60.368	4471.917

63	60.905	4433.592
64	61.446	4456.625
65	61.987	4465.435
66	62.538	4541.897
67	63.111	4727.293
68	63.555	3664.474
69	63.989	3581.499
70	64.488	4118.242
71	65.058	4696.771
72	65.535	3936.181
73	65.882	2863.449
74	66.277	3253.751
75	66.689	3397.990
76	67.098	3373.698
77	67.497	3291.950
78	67.896	3294.845
79	68.347	3720.829
80	68.702	2925.248
81	69.047	2845.388
82	69.392	2845.828
83	69.746	2920.465
84	70.116	3055.705
85	70.435	2624.435
86	70.756	2652.062
87	71.077	2651.055
88	71.398	2646.398
89	71.717	2628.337
90	72.032	2597.500
91	72.337	2515.626
92	72.629	2407.636
93	72.919	2392.532
94	73.208	2387.498
95	73.510	2491.083
96	73.804	2421.166
97	74.074	2232.183
98	74.344	2228.344
99	74.615	2227.589
100	74.885	2228.344
101	75.153	2216.576
102	75.426	2244.454
103	75.689	2171.202
104	75.945	2114.626
105	76.201	2114.815
106	76.449	2037.976
107	76.674	1860.383
108	76.903	1891.534
109	77.132	1883.290
110	77.360	1884.045
111	77.586	1861.264
112	77.798	1749.057
113	78.006	1716.836
114	78.214	1717.088
115	78.422	1710.606
116	78.616	1604.000
117	78.806	1569.010
118	78.997	1570.646
119	79.188	1582.351
120	79.395	1700.474
121	79.599	1683.356
122	79.787	1550.319
123	79.973	1540.942
124	80.160	1540.942
125	80.346	1528.734
126	80.526	1488.646
127	80.700	1436.979
128	80.874	1436.979
129	81.049	1437.420
130	81.223	1436.979

131	81.396	1431.504
132	81.568	1413.254
133	81.739	1407.968
134	81.908	1399.976
135	82.077	1395.822
136	82.243	1363.601
137	82.406	1344.470
138	82.557	1246.045
139	82.707	1234.969
140	82.855	1225.152
141	83.005	1235.536
142	83.154	1228.739
143	83.301	1210.300
144	83.443	1171.219
145	83.584	1166.625
146	83.725	1164.737
147	83.867	1169.457
148	84.009	1173.170
149	84.147	1136.796
150	84.284	1127.922

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 7531.4829  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 2003.5396  
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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

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

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TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	500.0	1000.0	1500.0	2000.0
14.000	492.0358	971.90	.	V.	Q.	.	.
14.083	498.8754	993.12	.	V.	Q.	.	.
14.167	505.8671	1015.20	.	V	Q	.	.
14.250	513.0231	1039.04	.	V	Q	.	.
14.333	520.3620	1065.61	.	V	.Q	.	.
14.417	527.8834	1092.11	.	V	.Q	.	.
14.500	535.5728	1116.49	.	V	.Q	.	.
14.583	543.4264	1140.35	.	V	.Q	.	.
14.667	551.4409	1163.70	.	.V	.Q	.	.
14.750	559.6188	1187.43	.	.V	.Q	.	.
14.833	567.9642	1211.76	.	.V	.Q	.	.
14.917	576.4775	1236.14	.	.V	.Q	.	.
15.000	585.1628	1261.10	.	.V	.Q	.	.
15.083	593.9998	1283.13	.	.V	.Q	.	.
15.167	602.9938	1305.94	.	.V	.Q	.	.
15.250	612.1586	1330.72	.	.V	.Q	.	.
15.333	621.5037	1356.92	.	.V	.Q	.	.
15.417	630.9908	1377.52	.	.V	.Q	.	.
15.500	640.6285	1399.41	.	.V	.Q	.	.
15.583	650.4011	1418.97	.	.V	.Q	.	.
15.667	660.3254	1441.02	.	.V	.Q	.	.
15.750	670.4195	1465.66	.	.V	.Q	.	.
15.833	680.6689	1488.22	.	.V	.Q	.	.
15.917	691.0872	1512.73	.	.V	.Q	.	.
16.000	701.6923	1539.87	.	.V	.Q	.	.
16.083	712.5404	1575.14	.	.V	.Q	.	.
16.167	723.6019	1606.13	.	.V	.Q	.	.
16.250	734.7935	1625.01	.	.V	.Q	.	.
16.333	746.1219	1644.89	.	.V	.Q	.	.
16.417	757.5933	1665.65	.	.V	.Q	.	.
16.500	769.2053	1686.06	.	.V	.Q	.	.
16.583	780.9487	1705.14	.	.V	.Q	.	.
16.667	792.8500	1728.07	.	.V	.Q	.	.
16.750	804.9218	1752.81	.	.V	.Q	.	.
16.833	817.0833	1765.86	.	.V	.Q	.	.
16.917	829.3416	1779.91	.	.V	.Q	.	.
17.000	841.7059	1795.30	.	.V	.Q	.	.
17.083	854.1509	1807.01	.	.V	.Q	.	.
17.167	866.6660	1817.19	.	.V	.Q	.	.
17.250	879.3052	1835.22	.	.V	.Q	.	.
17.333	892.0096	1844.68	.	.V	.Q	.	.
17.417	904.7286	1846.80	.	.V	.Q	.	.
17.500	917.6339	1873.85	.	.V	.Q	.	.
17.583	930.5297	1872.46	.	.V	.Q	.	.
17.667	943.4893	1881.74	.	.V	.Q	.	.
17.750	956.5305	1893.59	.	.V	.Q	.	.
17.833	969.6633	1906.88	.	.V	.Q	.	.
17.917	982.8989	1921.82	.	.V	.Q	.	.
18.000	996.2675	1941.12	.	.V	.Q	.	.
18.083	1009.6124	1937.68	.	.V	.Q	.	.
18.167	1022.9429	1935.58	.	.V	.Q	.	.
18.250	1036.3888	1952.35	.	.V	.Q	.	.
18.333	1049.9697	1971.94	.	.V	.Q	.	.
18.417	1063.5675	1974.40	.	.V	.Q	.	.
18.500	1077.0393	1956.11	.	.V	.Q	.	.
18.583	1090.4589	1948.51	.	.V	.Q	.	.

18.667	1103.8049	1937.86	.	.	.V	.	Q
18.750	1117.1433	1936.73	.	.	.V	.	Q
18.833	1130.4974	1939.01	.	.	.V	.	Q
18.917	1143.8185	1934.21	.	.	.V	.	Q
19.000	1157.0629	1923.09	.	.	.V	.	Q
19.083	1170.0807	1890.19	.	.	.V	.	Q
19.167	1183.0775	1887.13	.	.	.V	.	Q
19.250	1196.0294	1880.62	.	.	.V	.	Q
19.333	1208.9326	1873.55	.	.	.V	.	Q
19.417	1221.6489	1846.40	.	.	.V	.	Q
19.500	1234.3080	1838.10	.	.	.V	.	Q
19.583	1246.8523	1821.43	.	.	.V	.	Q
19.667	1259.4060	1822.80	.	.	.V	.	Q
19.750	1271.9445	1820.59	.	.	.V	.	Q
19.833	1284.2987	1793.84	.	.	.V	.	Q
19.917	1296.5387	1777.24	.	.	.V	.	Q
20.000	1308.5797	1748.35	.	.	.V	.	Q

=====

END OF FLOODSCx ROUTING ANALYSIS

=====

**PRELIMINARY DRAFT – FOR INTERNAL USE ONLY**

**TECHNICAL APPENDIX I-B  
HYDROLOGIC ANALYSIS  
EXISTING CONDITION  
10-YEAR EXPECTED VALUE**

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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-----  
FILE NAME: LE63010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.150  
FOOTHILL 0.150  
MOUNTAIN 0.640  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU62010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9034.05 Tc(MIN.) = 135.31  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.50  
TOTAL AREA(ACRES) = 46437.31  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9034.05 Tc(MIN.) = 135.31  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.50  
TOTAL AREA(ACRES) = 46437.31  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 345.00 DOWNSTREAM(FEET) = 319.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2852.00 CHANNEL SLOPE = 0.0091  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9034.05  
FLOW VELOCITY(FEET/SEC.) = 17.85 FLOW DEPTH(FEET) = 6.86  
TRAVEL TIME(MIN.) = 2.66 Tc(MIN.) = 137.97  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 137.97  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.607  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 79.80 0.40 1.00 40  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" A 4.40 0.40 0.50 32  
NATURAL FAIR COVER  
"GRASS" A 8.00 0.40 1.00 50  
AGRICULTURAL FAIR COVER  
"ORCHARDS" A 6.40 0.40 1.00 44  
NATURAL FAIR COVER  
"OPEN BRUSH" A 110.10 0.40 1.00 46  
COMMERCIAL A 1.70 0.40 0.10 32  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98  
SUBAREA AREA(ACRES) = 210.40  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.33;30M= 0.64;1H= 0.88;3H= 1.66;6H= 2.48;24H= 4.38

S-GRAPH: VALLEY(DEV.)= 1.1%;VALLEY(UNDEV.)/DESERT= 19.8%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.30; LAG(HR) = 1.84; Fm(INCH/HR) = 0.23; Ybar = 0.50  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.91; 24HR = 0.95  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 46647.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0338; Lca/L=0.4,n=.0303; Lca/L=0.5,n=.0278;Lca/L=0.6,n=.0260  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8133.74  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8964.06  
TOTAL AREA(ACRES) = 46647.70 PEAK FLOW RATE(CFS) = 9034.05  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.28; 30M = 0.60; 1HR = 0.81; 3HR = 1.40; 6HR = 1.98; 24HR = 3.37

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 137.97

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	A	56.90	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	7.50	0.30	1.00	63
NATURAL FAIR COVER					
"GRASS"	B	5.60	0.30	1.00	69
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	6.10	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	16.30	0.30	1.00	66
COMMERCIAL	B	1.90	0.30	0.10	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.36

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98

SUBAREA AREA(ACRES) = 94.30

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.33;30M= 0.64;1H= 0.88;3H= 1.66;6H= 2.48;24H= 4.38

S-GRAPH: VALLEY(DEV.)= 1.1%;VALLEY(UNDEV.)/DESERT= 19.8%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.30; LAG(HR) = 1.84; Fm(INCH/HR) = 0.23; Ybar = 0.50

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.40; 1HR = 0.44;

3HR = 0.79; 6HR = 0.91; 24HR = 0.95

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 46742.00

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0338; Lca/L=0.4,n=.0303; Lca/L=0.5,n=.0278;Lca/L=0.6,n=.0260

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8131.50

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8961.83

TOTAL AREA(ACRES) = 46742.00 PEAK FLOW RATE(CFS) = 9034.05

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.28; 30M = 0.60; 1HR = 0.81; 3HR = 1.40; 6HR = 1.98; 24HR = 3.37

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 137.97

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	B	23.70	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	679.90	0.25	1.00	75
NATURAL POOR COVER					
"BARREN"	C	1.80	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	161.40	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	1099.40	0.25	1.00	77
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	58.20	0.25	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 2024.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.33;30M= 0.63;1H= 0.88;3H= 1.65;6H= 2.46;24H= 4.33

S-GRAPH: VALLEY(DEV.)= 1.7%;VALLEY(UNDEV.)/DESERT= 19.2%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.30; LAG(HR) = 1.84; Fm(INCH/HR) = 0.23; Ybar = 0.51

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.35; 30M = 0.40; 1HR = 0.44;

3HR = 0.79; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 48766.40

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0338; Lca/L=0.4,n=.0303; Lca/L=0.5,n=.0278;Lca/L=0.6,n=.0260

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8293.72

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9108.83

TOTAL AREA(ACRES) = 48766.40 PEAK FLOW RATE(CFS) = 9108.83

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.28; 30M = 0.60; 1HR = 0.81; 3HR = 1.40; 6HR = 1.98; 24HR = 3.37

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 137.97

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	C	196.50	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	421.30	0.20	1.00	81
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	0.60	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	0.10	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	55.70	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	270.30	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 944.50

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.33;30M= 0.63;1H= 0.88;3H= 1.65;6H= 2.45;24H= 4.32

S-GRAPH: VALLEY(DEV.)= 1.9%;VALLEY(UNDEV.)/DESERT= 18.9%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.30; LAG(HR) = 1.84; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49710.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0338; Lca/L=0.4,n=.0303; Lca/L=0.5,n=.0278;Lca/L=0.6,n=.0260  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8391.84  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9203.04  
TOTAL AREA(ACRES) = 49710.90 PEAK FLOW RATE(CFS) = 9203.04

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.28; 30M = 0.60; 1HR = 0.81; 3HR = 1.40; 6HR = 1.98; 24HR = 3.37

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

-----  
>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 137.97  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	140.70	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	40.40	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 181.10

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.33;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.45;24H= 4.31  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 18.9%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.30; LAG(HR) = 1.84; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49892.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0338; Lca/L=0.4,n=.0303; Lca/L=0.5,n=.0278;Lca/L=0.6,n=.0260  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8415.43  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9225.31  
TOTAL AREA(ACRES) = 49892.00 PEAK FLOW RATE(CFS) = 9225.31

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.28; 30M = 0.60; 1HR = 0.81; 3HR = 1.40; 6HR = 1.98; 24HR = 3.37

-----  
END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 49892.00 TC(MIN.) = 137.97  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.51  
PEAK FLOW RATE(CFS) = 9225.31  
=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

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FILE NAME: LE64010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.020  
FOOTHILL 0.150  
MOUNTAIN 0.260  
VALLEY(UNDEVELOPED)/DESERT 0.570  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LE63010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9225.31 Tc(MIN.) = 137.97  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.51  
TOTAL AREA(ACRES) = 49892.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9225.31 Tc(MIN.) = 137.97  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.51  
TOTAL AREA(ACRES) = 49892.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 319.00 DOWNSTREAM(FEET) = 275.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5418.00 CHANNEL SLOPE = 0.0081  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9225.31  
FLOW VELOCITY(FEET/SEC.) = 17.29 FLOW DEPTH(FEET) = 7.18  
TRAVEL TIME(MIN.) = 5.22 Tc(MIN.) = 143.19  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 143.19  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.594  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	0.60	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	1.70	0.40	0.50	32
NATURAL FAIR COVER					
"GRASS"	A	1.30	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	0.90	0.40	1.00	44
URBAN FAIR COVER					
"TURF"	A	18.90	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	0.50	0.40	1.00	46

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.96  
SUBAREA AREA(ACRES) = 23.90  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.33;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.45;24H= 4.31  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 18.9%  
 MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.39; LAG(HR) = 1.91; Fm(INCH/HR) = 0.23; Ybar = 0.51  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49915.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0257  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8413.89  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9169.87  
 TOTAL AREA(ACRES) = 49915.90 PEAK FLOW RATE(CFS) = 9225.31  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*

FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 143.19  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	1.30	0.40	0.10	32
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	15.30	0.40	1.00	49
NATURAL FAIR COVER					
"WOODLAND"	A	8.20	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	22.20	0.30	1.00	63
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	0.50	0.30	0.50	56
NATURAL FAIR COVER					
"GRASS"	B	65.20	0.30	1.00	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.32  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 112.70  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.33;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.45;24H= 4.31  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.0%  
 MOUNTAIN= 63.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.39; LAG(HR) = 1.91; Fm(INCH/HR) = 0.23; Ybar = 0.51  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 50028.60  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0257  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8413.37  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9169.57  
 TOTAL AREA(ACRES) = 50028.60 PEAK FLOW RATE(CFS) = 9225.31  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*

FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 143.19  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	C	236.40	0.25	1.00	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	0.40	0.25	0.50	69
NATURAL FAIR COVER					
"GRASS"	C	74.30	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	195.50	0.25	1.00	77
COMMERCIAL	C	0.40	0.25	0.10	69
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	C	8.60	0.25	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 515.60  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.44;24H= 4.29

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*

FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 143.19  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	2.30	0.30	1.00	65
URBAN FAIR COVER					
"TURF"	B	18.50	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	30.20	0.30	1.00	66
COMMERCIAL	B	5.60	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	19.10	0.30	1.00	69
NATURAL FAIR COVER					
"WOODLAND"	B	13.40	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
 SUBAREA AREA(ACRES) = 89.10  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.33;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.44;24H= 4.31  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.1%  
 MOUNTAIN= 63.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.39; LAG(HR) = 1.91; Fm(INCH/HR) = 0.23; Ybar = 0.51  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 50117.70  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0257  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8414.60  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9171.12  
 TOTAL AREA(ACRES) = 50117.70 PEAK FLOW RATE(CFS) = 9225.31  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*

FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*

MAINLINE Tc(MIN) = 143.19  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	C	236.40	0.25	1.00	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	0.40	0.25	0.50	69
NATURAL FAIR COVER					
"GRASS"	C	74.30	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	195.50	0.25	1.00	77
COMMERCIAL	C	0.40	0.25	0.10	69
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	C	8.60	0.25	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 515.60  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.44;24H= 4.29

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*

FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.5%  
MOUNTAIN= 63.5%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.39; LAG(HR) = 1.91; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 50633.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0257  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8444.23  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9200.78  
TOTAL AREA(ACRES) = 50633.30 PEAK FLOW RATE(CFS) = 9225.31  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

MAINLINE Tc(MIN) = 143.19

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	4.00	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	61.90	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	139.90	0.20	1.00	81
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	5.20	0.20	0.50	75
NATURAL FAIR COVER					
"GRASS"	D	97.60	0.20	1.00	84
URBAN FAIR COVER					
"TURF"	D	5.60	0.20	1.00	82

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99

SUBAREA AREA(ACRES) = 314.20

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.43;24H= 4.29

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.7%

MOUNTAIN= 63.2%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.39; LAG(HR) = 1.91; Fm(INCH/HR) = 0.23; Ybar = 0.51

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;

3HR = 0.78; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 50947.50

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8470.76

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9227.48

TOTAL AREA(ACRES) = 50947.50 PEAK FLOW RATE(CFS) = 9227.48

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

MAINLINE Tc(MIN) = 143.19

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	D	191.80	0.20	1.00	83
COMMERCIAL	D	4.40	0.20	0.10	75
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	D	17.10	0.20	1.00	84
PUBLIC PARK	D	7.90	0.20	0.85	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	1.50	0.20	1.00	86
NATURAL FAIR COVER					
"WOODLAND"	D	56.50	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98

SUBAREA AREA(ACRES) = 279.20

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.43;24H= 4.28

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.9%

MOUNTAIN= 63.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.39; LAG(HR) = 1.91; Fm(INCH/HR) = 0.23; Ybar = 0.51

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;

3HR = 0.78; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51226.70

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8497.54

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9254.24

TOTAL AREA(ACRES) = 51226.70 PEAK FLOW RATE(CFS) = 9254.24

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 51226.70 TC(MIN.) = 143.19

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.51

PEAK FLOW RATE(CFS) = 9254.24

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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FILE NAME: LE65010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.020  
FOOTHILL 0.150  
MOUNTAIN 0.070  
VALLEY(UNDEVELOPED)/DESERT 0.760  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LE64010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9254.24 Tc(MIN.) = 143.19  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.51  
TOTAL AREA(ACRES) = 51226.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9254.24 Tc(MIN.) = 143.19  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.51  
TOTAL AREA(ACRES) = 51226.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 275.00 DOWNSTREAM(FEET) = 240.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5738.00 CHANNEL SLOPE = 0.0061  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9254.24  
FLOW VELOCITY(FEET/SEC.) = 15.69 FLOW DEPTH(FEET) = 7.80  
TRAVEL TIME(MIN.) = 6.09 Tc(MIN.) = 149.29  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 149.29  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.580  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	3.80	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	20.30	0.40	0.50	32
NATURAL POOR COVER					
"BARREN"	A	0.90	0.40	1.00	78
NATURAL FAIR COVER					
"GRASS"	A	29.30	0.40	1.00	50
URBAN FAIR COVER					
"TURF"	A	0.80	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	3.30	0.40	1.00	46

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.83  
SUBAREA AREA(ACRES) = 58.40  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.43;24H= 4.28  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 20.0%  
 MOUNTAIN= 63.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.51  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51285.10  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0274;Lca/L=0.6,n=.0255  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8496.62  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9140.87  
 TOTAL AREA(ACRES) = 51285.10 PEAK FLOW RATE(CFS) = 9254.24  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 149.29  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.90	0.40	0.10	32
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	47.10	0.40	1.00	49
NATURAL FAIR COVER					
"WOODLAND"	A	9.80	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	8.90	0.30	1.00	63
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	15.00	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	9.70	0.30	1.00	86

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.37  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.91  
 SUBAREA AREA(ACRES) = 91.40  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.63;6H= 2.43;24H= 4.28  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 20.1%  
 MOUNTAIN= 62.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.51  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51376.49  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0274;Lca/L=0.6,n=.0255  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8495.39  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9139.91  
 TOTAL AREA(ACRES) = 51376.49 PEAK FLOW RATE(CFS) = 9254.24  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 149.29  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	B	61.80	0.30	1.00	69
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	30.20	0.30	1.00	65
URBAN FAIR COVER					
"TURF"	B	0.70	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	56.20	0.30	1.00	66
COMMERCIAL	B	3.90	0.30	0.10	56
PUBLIC PARK	B	10.90	0.30	0.85	56

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97  
 SUBAREA AREA(ACRES) = 163.70  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.63;6H= 2.43;24H= 4.27  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 20.2%  
 MOUNTAIN= 62.7%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.52  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51540.19  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0274;Lca/L=0.6,n=.0255  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8497.38  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9142.60  
 TOTAL AREA(ACRES) = 51540.19 PEAK FLOW RATE(CFS) = 9254.24  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 149.29  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	0.70	0.30	1.00	69
NATURAL FAIR COVER					
"WOODLAND"	B	65.20	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	C	210.40	0.25	1.00	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	9.60	0.25	0.50	69
NATURAL POOR COVER					
"BARREN"	C	14.70	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	145.30	0.25	1.00	79

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 445.90  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.63;6H= 2.42;24H= 4.26

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 20.7%  
MOUNTAIN= 62.2%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.52  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51986.09  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0274;Lca/L=0.6,n=.0255  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8520.16  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9166.16  
TOTAL AREA(ACRES) = 51986.09 PEAK FLOW RATE(CFS) = 9254.24  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 149.29

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	C	6.50	0.25	1.00	77
URBAN FAIR COVER					
"TURF"	C	0.70	0.25	1.00	77
NATURAL FAIR COVER					
"OPEN BRUSH"	C	350.80	0.25	1.00	77
COMMERCIAL	C	4.00	0.25	0.10	69
PUBLIC PARK	C	47.00	0.25	0.85	69
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	60.40	0.25	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98

SUBAREA AREA(ACRES) = 469.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.63;6H= 2.42;24H= 4.25

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.2%

MOUNTAIN= 61.7%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.52

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.39; 1HR = 0.43;

3HR = 0.78; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52455.49

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0274;Lca/L=0.6,n=.0255

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8549.78

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9195.96

TOTAL AREA(ACRES) = 52455.49 PEAK FLOW RATE(CFS) = 9254.24

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 149.29

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	C	0.40	0.25	1.00	79
NATURAL FAIR COVER					
"WOODLAND"	C	210.20	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	22.00	0.20	1.00	81
PUBLIC PARK	D	4.50	0.20	0.85	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	12.60	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	21.40	0.20	1.00	93

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97

SUBAREA AREA(ACRES) = 271.10

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.63;6H= 2.41;24H= 4.24

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.5%

MOUNTAIN= 61.4%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.52

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.39; 1HR = 0.43;

3HR = 0.78; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52726.59

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0274;Lca/L=0.6,n=.0255

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8565.68

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9212.45

TOTAL AREA(ACRES) = 52726.59 PEAK FLOW RATE(CFS) = 9254.24

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 149.29

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	D	136.70	0.20	1.00	84
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	10.20	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	3.30	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	93.70	0.20	1.00	83
COMMERCIAL	D	0.40	0.20	0.10	75
NATURAL GOOD COVER					
"MEADOWS"	D	10.00	0.20	1.00	78

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 254.30

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.62;6H= 2.41;24H= 4.24

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.7%

MOUNTAIN= 61.2%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.52  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52980.89  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0274;Lca/L=0.6,n=.0255  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8591.66  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9238.97  
 TOTAL AREA(ACRES) = 52980.89 PEAK FLOW RATE(CFS) = 9254.24  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

=====

MAINLINE Tc(MIN) = 149.29  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	70.40	0.20	1.00	86
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	3.80	0.20	1.00	84
NATURAL FAIR COVER					
"WOODLAND"	D	68.20	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 142.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.62;6H= 2.41;24H= 4.23  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 61.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.52  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53123.29  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0274;Lca/L=0.6,n=.0255  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8605.79  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9253.64  
 TOTAL AREA(ACRES) = 53123.29 PEAK FLOW RATE(CFS) = 9254.24  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

=====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 53123.29 TC(MIN.) = 149.29  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.52  
 PEAK FLOW RATE(CFS) = 9254.24

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LE66010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
===

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.020  
FOOTHILL 0.080  
MOUNTAIN 0.680  
VALLEY(UNDEVELOPED)/DESERT 0.220  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LE65010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9254.24 Tc(MIN.) = 149.29  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.52  
TOTAL AREA(ACRES) = 53123.29  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9254.24 Tc(MIN.) = 149.29  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.52  
TOTAL AREA(ACRES) = 53123.29  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 240.00 DOWNSTREAM(FEET) = 213.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6295.00 CHANNEL SLOPE = 0.0043  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9254.24  
FLOW VELOCITY(FEET/SEC.) = 11.49 FLOW DEPTH(FEET) = 7.98  
TRAVEL TIME(MIN.) = 9.13 Tc(MIN.) = 158.41  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 158.41  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.560  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	A	19.80	0.40	0.85	32
AGRICULTURAL POOR COVER					
"FALLOW"	A	2.20	0.40	1.00	77
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	17.60	0.40	0.50	32
NATURAL POOR COVER					
"BARREN"	A	67.40	0.40	1.00	78
NATURAL FAIR COVER					
"GRASS"	A	59.40	0.40	1.00	50
URBAN FAIR COVER					
"TURF"	A	39.00	0.40	1.00	44

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
SUBAREA AREA(ACRES) = 205.40  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.62;6H= 2.41;24H= 4.23

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
MOUNTAIN= 61.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.52  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 53328.69  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8566.50  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8892.97  
TOTAL AREA(ACRES) = 53328.69 PEAK FLOW RATE(CFS) = 9254.24  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 158.41

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	A	9.30	0.40	1.00	46
COMMERCIAL	A	17.30	0.40	0.10	32
NATURAL GOOD COVER					
"MEADOWS"	A	0.40	0.40	1.00	30
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	69.80	0.40	1.00	49
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	3.60	0.40	1.00	40
NATURAL FAIR COVER					
"WOODLAND"	A	108.30	0.40	1.00	36

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93

SUBAREA AREA(ACRES) = 208.70

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.62;6H= 2.40;24H= 4.23

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 61.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.52

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;

3HR = 0.77; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 53537.39

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8556.07

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8881.21

TOTAL AREA(ACRES) = 53537.39 PEAK FLOW RATE(CFS) = 9254.24

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 158.41  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	104.10	0.30	1.00	63
NATURAL GOOD COVER					
"MEADOWS"	B	28.00	0.30	1.00	58
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	179.50	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	235.20	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	338.30	0.30	1.00	69
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	37.70	0.30	1.00	65

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90

SUBAREA AREA(ACRES) = 922.80

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.62;6H= 2.39;24H= 4.21

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 61.2%;FOOTHILL= 14.9%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.52

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;

3HR = 0.77; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 54460.19

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8603.76

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8916.67

TOTAL AREA(ACRES) = 54460.19 PEAK FLOW RATE(CFS) = 9254.24

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 158.41

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN FAIR COVER					
"TURF"	B	139.20	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	151.00	0.30	1.00	66
COMMERCIAL	B	352.90	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	215.10	0.30	1.00	69
PUBLIC PARK	B	22.20	0.30	0.85	56
NATURAL FAIR COVER					
"CHAPARRAL, NARROWLEAF"	B	2.40	0.30	1.00	72

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.64

SUBAREA AREA(ACRES) = 882.80

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.61;6H= 2.38;24H= 4.19

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 61.3%;FOOTHILL= 14.8%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.53  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 55342.99  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8679.53  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8984.93  
 TOTAL AREA(ACRES) = 55342.99 PEAK FLOW RATE(CFS) = 9254.24  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 158.41  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	B	259.40	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	277.70	0.25	1.00	75
AGRICULTURAL POOR COVER					
"FALLOW"	C	90.50	0.25	1.00	91
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	233.10	0.25	0.50	69
NATURAL POOR COVER					
"BARREN"	C	196.30	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	706.70	0.25	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
 SUBAREA AREA(ACRES) = 1763.70  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.60;6H= 2.37;24H= 4.15  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 61.5%;FOOTHILL= 14.6%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.53  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.32; 30M = 0.37; 1HR = 0.42;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 57106.69  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8810.93  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9089.56  
 TOTAL AREA(ACRES) = 57106.69 PEAK FLOW RATE(CFS) = 9254.24  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 158.41  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	C	12.40	0.25	1.00	77
URBAN FAIR COVER					
"TURF"	C	53.80	0.25	1.00	77
NATURAL FAIR COVER					
"OPEN BRUSH"	C	1739.10	0.25	1.00	77
COMMERCIAL	C	417.20	0.25	0.10	69
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	C	258.40	0.25	1.00	79
PUBLIC PARK	C	1.50	0.25	0.85	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.85  
 SUBAREA AREA(ACRES) = 2482.40  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.31;30M= 0.63;1H= 0.86;3H= 1.59;6H= 2.34;24H= 4.10  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 61.8%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.53  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.37; 1HR = 0.41;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 59589.09  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9034.36  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9285.73  
 TOTAL AREA(ACRES) = 59589.09 PEAK FLOW RATE(CFS) = 9285.73

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 158.41  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL GOOD COVER					
"MEADOWS"	C	4.00	0.25	1.00	71
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	29.00	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	359.50	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	154.40	0.20	1.00	81
PUBLIC PARK	D	46.70	0.20	0.85	75
AGRICULTURAL POOR COVER					
"FALLOW"	D	38.90	0.20	1.00	94

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 632.50  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.31;30M= 0.63;1H= 0.86;3H= 1.59;6H= 2.34;24H= 4.09  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 61.9%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.53

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.37; 1HR = 0.41;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 60221.59  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9078.38  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9323.90  
 TOTAL AREA(ACRES) = 60221.59 PEAK FLOW RATE(CFS) = 9323.90

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----

MAINLINE Tc(MIN) = 158.41

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	13.30	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	33.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	223.80	0.20	1.00	84
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	87.20	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	6.00	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	420.00	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99

SUBAREA AREA(ACRES) = 783.90

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.63;1H= 0.86;3H= 1.58;6H= 2.33;24H= 4.08

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 61.9%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.53

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;

3HR = 0.75; 6HR = 0.89; 24HR= 0.94

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 61005.48

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9163.34

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9399.96

TOTAL AREA(ACRES) = 61005.48 PEAK FLOW RATE(CFS) = 9399.96

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
 MAINLINE Tc(MIN) = 158.41

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	D	35.20	0.20	0.10	75
NATURAL GOOD COVER					
"MEADOWS"	D	1.60	0.20	1.00	78
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	20.20	0.20	1.00	86
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	281.40	0.20	1.00	84
NATURAL FAIR COVER					
"WOODLAND"	D	83.00	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.92

SUBAREA AREA(ACRES) = 421.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.58;6H= 2.33;24H= 4.07

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.53

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;

3HR = 0.75; 6HR = 0.89; 24HR= 0.94

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 61426.88

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9210.77

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9442.68

TOTAL AREA(ACRES) = 61426.88 PEAK FLOW RATE(CFS) = 9442.68

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

-----  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 61426.88 TC(MIN.) = 158.41

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.53

PEAK FLOW RATE(CFS) = 9442.68  
 -----

-----  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LE67010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
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=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.020  
FOOTHILL 0.140  
MOUNTAIN 0.620  
VALLEY(UNDEVELOPED)/DESERT 0.220  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LE66010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9442.68 Tc(MIN.) = 158.41  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.53  
TOTAL AREA(ACRES) = 61426.88  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9442.68 Tc(MIN.) = 158.41  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.53  
TOTAL AREA(ACRES) = 61426.88  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 213.00 DOWNSTREAM(FEET) = 176.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6201.00 CHANNEL SLOPE = 0.0060  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9442.68  
FLOW VELOCITY(FEET/SEC.) = 12.92 FLOW DEPTH(FEET) = 7.33  
TRAVEL TIME(MIN.) = 8.00 Tc(MIN.) = 166.41  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 166.41  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.545  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
AGRICULTURAL POOR COVER  
"FALLOW" A 0.20 0.40 1.00 77  
NATURAL FAIR COVER  
"GRASS" A 0.90 0.40 1.00 50  
NATURAL FAIR COVER  
"OPEN BRUSH" A 8.90 0.40 1.00 46  
AGRICULTURAL FAIR COVER  
"PASTURE, DRYLAND" A 5.50 0.40 1.00 49  
NATURAL FAIR COVER  
"WOODLAND" A 17.90 0.40 1.00 36  
NATURAL FAIR COVER  
"CHAPARRAL, BROADLEAF" B 11.60 0.30 1.00 63  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.37  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 45.00  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.58;6H= 2.33;24H= 4.07  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.23; Ybar = 0.53  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 61471.88  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9208.65  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9300.43  
 TOTAL AREA(ACRES) = 61471.88 PEAK FLOW RATE(CFS) = 9442.68  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 166.41  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER "FALLOW"	B	450.40	0.30	1.00	86
RESIDENTIAL "5-7 DWELLINGS/ACRE"	B	77.20	0.30	0.50	56
NATURAL FAIR COVER "GRASS"	B	47.20	0.30	1.00	69
AGRICULTURAL FAIR COVER "ORCHARDS"	B	22.50	0.30	1.00	65
URBAN FAIR COVER "TURF"	B	5.30	0.30	1.00	65
NATURAL FAIR COVER "OPEN BRUSH"	B	156.70	0.30	1.00	66

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
 SUBAREA AREA(ACRES) = 759.30  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.58;6H= 2.32;24H= 4.06  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.23; Ybar = 0.53  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 62231.18  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9271.84  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9351.80  
 TOTAL AREA(ACRES) = 62231.18 PEAK FLOW RATE(CFS) = 9442.68  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
 \*\*\*\*\*  
 MAINLINE Tc(MIN) = 166.41  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL AGRICULTURAL FAIR COVER	B	6.20	0.30	0.10	56
"PASTURE, DRYLAND"	B	529.80	0.30	1.00	69
PUBLIC PARK NATURAL GOOD COVER	B	0.20	0.30	0.85	56
"MEADOWS" NATURAL FAIR COVER	B	1.80	0.30	1.00	58
"CHAPARRAL, NARROWLEAF" NATURAL FAIR COVER	B	1.60	0.30	1.00	72
"WOODLAND"	B	71.30	0.30	1.00	60

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 610.90  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.58;6H= 2.32;24H= 4.05  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.23; Ybar = 0.53  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.40;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 62842.08  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9284.36  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9358.29  
 TOTAL AREA(ACRES) = 62842.08 PEAK FLOW RATE(CFS) = 9442.68  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 166.41  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	C	132.80	0.25	1.00	75
AGRICULTURAL POOR COVER "FALLOW"	C	226.40	0.25	1.00	91
NATURAL POOR COVER "BARREN"	C	8.70	0.25	1.00	91
NATURAL FAIR COVER "GRASS"	C	379.30	0.25	1.00	79
AGRICULTURAL FAIR COVER "ORCHARDS"	C	0.70	0.25	1.00	77
NATURAL FAIR COVER "OPEN BRUSH"	C	1062.60	0.25	1.00	77

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1810.50  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.57;6H= 2.30;24H= 4.02  
 S-GGRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.23; Ybar = 0.54  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 64652.58  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9427.64  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9477.56  
 TOTAL AREA(ACRES) = 64652.58 PEAK FLOW RATE(CFS) = 9477.56

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 166.41

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	10.80	0.25	0.10	69
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	C	206.00	0.25	1.00	79
NATURAL GOOD COVER					
"MEADOWS"	C	0.20	0.25	1.00	71
NATURAL FAIR COVER					
"WOODLAND"	C	116.80	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	D	30.80	0.20	1.00	81
AGRICULTURAL POOR COVER					
"FALLOW"	D	158.40	0.20	1.00	94

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98

SUBAREA AREA(ACRES) = 523.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.57;6H= 2.30;24H= 4.01

S-GGRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.23; Ybar = 0.54

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 65175.58

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9481.65

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9524.10

TOTAL AREA(ACRES) = 65175.58 PEAK FLOW RATE(CFS) = 9524.10

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 166.41

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	59.00	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	0.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	444.70	0.20	1.00	84
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	5.30	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	4.00	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	461.60	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97

SUBAREA AREA(ACRES) = 975.20

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.56;6H= 2.29;24H= 4.00

S-GGRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.23; Ybar = 0.54

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 66150.78

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9584.82

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9614.81

TOTAL AREA(ACRES) = 66150.78 PEAK FLOW RATE(CFS) = 9614.81

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 166.41

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	D	2.70	0.20	0.10	75
PUBLIC PARK	D	0.10	0.20	0.85	75
NATURAL GOOD COVER					
"MEADOWS"	D	0.60	0.20	1.00	78
NATURAL FAIR COVER					
"CHAPARRAL, NARROWLEAF"	D	9.10	0.20	1.00	86
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	D	368.40	0.20	1.00	84
NATURAL FAIR COVER					
"WOODLAND"	D	79.50	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99

SUBAREA AREA(ACRES) = 460.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.29;24H= 3.99

S-GGRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.23; Ybar = 0.54

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 66611.18  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9631.87  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9655.80  
TOTAL AREA(ACRES) = 66611.18 PEAK FLOW RATE(CFS) = 9655.80

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 66611.18 TC(MIN.) = 166.41  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.54  
PEAK FLOW RATE(CFS) = 9655.80

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

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FILE NAME: LE68010E.DAT  
TIME/DATE OF STUDY: 08:56 02/17/2004  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

USER SPECIFIED STORM EVENT(YEAR) = 10.00

SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00

SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 5.100
- 2) 10.000; 3.100
- 3) 15.000; 2.500
- 4) 20.000; 1.800
- 5) 30.000; 1.350
- 6) 60.000; 1.000
- 7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / SIDE / SIDE / WAY	STREET-CROSSFALL: (FT)	CURB (FT)	GUTTER-GEOMETRIES: (FT)	MANNING (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.020
FOOTHILL	0.140
MOUNTAIN	0.190
VALLEY(UNDEVELOPED)/DESERT	0.650
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LE67010E.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9655.80 Tc(MIN.) = 166.41

AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.54

TOTAL AREA(ACRES) = 66611.18

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 9655.80 Tc(MIN.) = 166.41

AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.54

TOTAL AREA(ACRES) = 66611.18

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 176.00 DOWNSTREAM(FEET) = 133.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 6324.00 CHANNEL SLOPE = 0.0068

CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000

MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00

CHANNEL FLOW THRU SUBAREA(CFS) = 9655.80

FLOW VELOCITY(FEET/SEC.) = 13.60 FLOW DEPTH(FEET) = 7.15

TRAVEL TIME(MIN.) = 7.75 Tc(MIN.) = 174.17

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 174.17

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.531

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	2.20	0.40	1.00	40
AGRICULTURAL POOR COVER					
"FALLOW"	A	5.20	0.40	1.00	77
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.20	0.40	0.50	32
NATURAL FAIR COVER					
"GRASS"	A	6.20	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	15.80	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	3.10	0.40	1.00	46

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 32.70

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.29;24H= 3.99  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.23; Ybar = 0.54  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 66643.88  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9630.60  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9524.48  
 TOTAL AREA(ACRES) = 66643.88 PEAK FLOW RATE(CFS) = 9655.80  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*

FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 174.17  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	4.90	0.40	0.10	32
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	31.60	0.40	1.00	49
NATURAL FAIR COVER					
"WOODLAND"	A	21.00	0.40	1.00	36
AGRICULTURAL POOR COVER					
"FALLOW"	B	22.40	0.30	1.00	86
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	19.00	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	2.00	0.30	1.00	86

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.36  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.86  
 SUBAREA AREA(ACRES) = 100.90  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.29;24H= 3.99  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.0%  
 MOUNTAIN= 61.9%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.23; Ybar = 0.54  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 66744.78  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9633.17  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9526.19  
 TOTAL AREA(ACRES) = 66744.78 PEAK FLOW RATE(CFS) = 9655.80  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*

FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 174.17  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	B	20.90	0.30	1.00	69
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	30.90	0.30	1.00	65
URBAN FAIR COVER					
"TURF"	B	0.70	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	1.10	0.30	1.00	66
COMMERCIAL	B	8.00	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	65.80	0.30	1.00	69

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
 SUBAREA AREA(ACRES) = 127.40  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.29;24H= 3.99  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.1%  
 MOUNTAIN= 61.8%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.23; Ybar = 0.54  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 66872.18  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9636.68  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9528.81  
 TOTAL AREA(ACRES) = 66872.18 PEAK FLOW RATE(CFS) = 9655.80  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*

FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 174.17  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	B	0.40	0.30	0.85	56
NATURAL FAIR COVER					
"WOODLAND"	B	11.80	0.30	1.00	60
NATURAL FAIR COVER					
"GRASS"	C	222.20	0.25	1.00	79
AGRICULTURAL FAIR COVER					
"ORCHARDS"	C	5.10	0.25	1.00	77
NATURAL FAIR COVER					
"OPEN BRUSH"	C	71.50	0.25	1.00	77
COMMERCIAL	C	2.90	0.25	0.10	69

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 313.90  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.28;24H= 3.98  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.3%

MOUNTAIN= 61.6%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.23; Ybar = 0.54  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 67186.08  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9658.41  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9547.42  
 TOTAL AREA(ACRES) = 67186.08 PEAK FLOW RATE(CFS) = 9655.80  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
 MAINLINE Tc(MIN) = 174.17

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	C	0.70	0.25	0.85	69
NATURAL FAIR COVER					
"WOODLAND"	C	22.40	0.25	1.00	73
AGRICULTURAL POOR COVER					
"FALLOW"	D	104.40	0.20	1.00	94
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	142.90	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	0.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	421.50	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90

SUBAREA AREA(ACRES) = 692.50

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.28;24H= 3.97  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.7%

MOUNTAIN= 61.2%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.23; Ybar = 0.54

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;

3HR = 0.74; 6HR = 0.89; 24HR= 0.93

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 67878.58

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258

TIME OF PEAK FLOW(HR) = 18.33 RUNOFF VOLUME(AF) = 9742.64

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9624.52

TOTAL AREA(ACRES) = 67878.58 PEAK FLOW RATE(CFS) = 9655.80

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
 MAINLINE Tc(MIN) = 174.17

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	18.30	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	6.30	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	188.90	0.20	1.00	83
COMMERCIAL	D	37.80	0.20	0.10	75
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	D	9.80	0.20	1.00	84
NATURAL FAIR COVER					
"WOODLAND"	D	65.50	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90

SUBAREA AREA(ACRES) = 326.60

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.55;6H= 2.28;24H= 3.97

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.9%

MOUNTAIN= 61.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.23; Ybar = 0.54

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;

3HR = 0.74; 6HR = 0.89; 24HR= 0.93

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 68205.18

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0277;Lca/L=0.6,n=.0258

TIME OF PEAK FLOW(HR) = 18.33 RUNOFF VOLUME(AF) = 9777.41

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9657.28

TOTAL AREA(ACRES) = 68205.18 PEAK FLOW RATE(CFS) = 9657.28

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

-----  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 68205.18 TC(MIN.) = 174.17

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.54

PEAK FLOW RATE(CFS) = 9657.28

-----  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

**PRELIMINARY DRAFT – FOR INTERNAL USE ONLY**

**TECHNICAL APPENDIX I-B  
HYDROLOGIC ANALYSIS  
EXISTING CONDITION  
100-YEAR EXPECTED VALUE**



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

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FILE NAME: LE63100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.150  
FOOTHILL 0.150  
MOUNTAIN 0.640  
VALLEY(UNDEVELOPED)/DESERT 0.060  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOW RATE(CFS)	Tc(MIN.)	AREA-AVERAGED Fm(INCH/HR)	Ybar	TOTAL AREA(ACRES)	LONGEST FLOWPATH FROM NODE	TO NODE	FEET
17976.47	115.61	0.23	0.38	46437.31	1000.00	1062.00	96841.00

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 17976.47 Tc(MIN.) = 115.61  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.38  
TOTAL AREA(ACRES) = 46437.31  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 345.00 DOWNSTREAM(FEET) = 319.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2852.00 CHANNEL SLOPE = 0.0091  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 17976.47  
FLOW VELOCITY(FEET/SEC.) = 22.15 FLOW DEPTH(FEET) = 10.11  
TRAVEL TIME(MIN.) = 2.15 Tc(MIN.) = 117.76  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 117.76  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.012  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	79.80	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	4.40	0.40	0.50	32
NATURAL FAIR COVER					
"GRASS"	A	8.00	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	6.40	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	110.10	0.40	1.00	46
COMMERCIAL	A	1.70	0.40	0.10	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98  
SUBAREA AREA(ACRES) = 210.40  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.52;30M= 0.96;1H= 1.33;3H= 2.51;6H= 3.77;24H= 6.64

S-GRAPH: VALLEY(DEV.)= 1.1%;VALLEY(UNDEV.)/DESERT= 19.8%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.96; LAG(HR) = 1.57; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.91; 24HR = 0.95  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 46647.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0222  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 15433.06  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 17952.51  
TOTAL AREA(ACRES) = 46647.70 PEAK FLOW RATE(CFS) = 17976.47  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.43; 30M = 0.89; 1HR = 1.20; 3HR = 2.09; 6HR = 2.98; 24HR = 5.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 117.76

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.212  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"WOODLAND" A 56.90 0.40 1.00 36  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 7.50 0.30 1.00 63  
NATURAL FAIR COVER  
"GRASS" B 5.60 0.30 1.00 69  
AGRICULTURAL FAIR COVER  
"ORCHARDS" B 6.10 0.30 1.00 65  
NATURAL FAIR COVER  
"OPEN BRUSH" B 16.30 0.30 1.00 66  
COMMERCIAL B 1.90 0.30 0.10 56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.36  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98  
SUBAREA AREA(ACRES) = 94.30

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.52;30M= 0.96;1H= 1.33;3H= 2.51;6H= 3.77;24H= 6.63  
S-GRAPH: VALLEY(DEV.)= 1.1%;VALLEY(UNDEV.)/DESERT= 19.8%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.96; LAG(HR) = 1.57; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.91; 24HR = 0.95  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 46742.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0222  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 15434.53  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 17957.19  
TOTAL AREA(ACRES) = 46742.00 PEAK FLOW RATE(CFS) = 17976.47  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.43; 30M = 0.89; 1HR = 1.20; 3HR = 2.09; 6HR = 2.98; 24HR = 5.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 117.76

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.212  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"WOODLAND" B 23.70 0.30 1.00 60  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 679.90 0.25 1.00 75  
NATURAL POOR COVER  
"BARREN" C 1.80 0.25 1.00 91  
NATURAL FAIR COVER  
"GRASS" C 161.40 0.25 1.00 79  
NATURAL FAIR COVER  
"OPEN BRUSH" C 1099.40 0.25 1.00 77  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 58.20 0.25 1.00 81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 2024.40

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.33;3H= 2.49;6H= 3.73;24H= 6.57

S-GRAPH: VALLEY(DEV.)= 1.7%;VALLEY(UNDEV.)/DESERT= 19.2%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.96; LAG(HR) = 1.57; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.35; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 48766.40  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0222  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 15798.28  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18329.91  
TOTAL AREA(ACRES) = 48766.40 PEAK FLOW RATE(CFS) = 18329.91

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.43; 30M = 0.89; 1HR = 1.20; 3HR = 2.09; 6HR = 2.98; 24HR = 5.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 117.76

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.212  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"WOODLAND" C 196.50 0.25 1.00 73  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 421.30 0.20 1.00 81  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" D 0.60 0.20 0.50 75  
NATURAL POOR COVER  
"BARREN" D 0.10 0.20 1.00 93  
NATURAL FAIR COVER  
"GRASS" D 55.70 0.20 1.00 84  
NATURAL FAIR COVER  
"OPEN BRUSH" D 270.30 0.20 1.00 83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 944.50

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.49;6H= 3.72;24H= 6.54

S-GRAPH: VALLEY(DEV.)= 1.9%;VALLEY(UNDEV.)/DESERT= 18.9%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.96; LAG(HR) = 1.57; Fm(INCH/HR) = 0.23; Ybar = 0.39

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49710.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0222  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 15993.51  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18529.48  
 TOTAL AREA(ACRES) = 49710.90 PEAK FLOW RATE(CFS) = 18529.48

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.43; 30M = 0.89; 1HR = 1.20; 3HR = 2.09; 6HR = 2.98; 24HR = 5.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

-----  
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
 =====

MAINLINE Tc(MIN) = 117.76  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.212  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	140.70	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	40.40	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 181.10  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.49;6H= 3.72;24H= 6.53  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 18.9%  
 MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.96; LAG(HR) = 1.57; Fm(INCH/HR) = 0.23; Ybar = 0.39

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49892.00  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0222  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16036.41  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18571.53  
 TOTAL AREA(ACRES) = 49892.00 PEAK FLOW RATE(CFS) = 18571.53

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.43; 30M = 0.89; 1HR = 1.20; 3HR = 2.09; 6HR = 2.98; 24HR = 5.03

-----  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 49892.00 TC(MIN.) = 117.76  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.39  
 PEAK FLOW RATE(CFS) = 18571.53  
 =====

-----  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LE64100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.020  
FOOTHILL 0.150  
MOUNTAIN 0.260  
VALLEY(UNDEVELOPED)/DESERT 0.570  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LE63100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18571.53 Tc(MIN.) = 117.76  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.39  
TOTAL AREA(ACRES) = 49892.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18571.53 Tc(MIN.) = 117.76  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.39  
TOTAL AREA(ACRES) = 49892.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 319.00 DOWNSTREAM(FEET) = 275.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5418.00 CHANNEL SLOPE = 0.0081  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 18571.53  
FLOW VELOCITY(FEET/SEC.) = 21.49 FLOW DEPTH(FEET) = 10.63  
TRAVEL TIME(MIN.) = 4.20 Tc(MIN.) = 121.96  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 121.96  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.992  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	0.60	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	1.70	0.40	0.50	32
NATURAL FAIR COVER					
"GRASS"	A	1.30	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	0.90	0.40	1.00	44
URBAN FAIR COVER					
"TURF"	A	18.90	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	0.50	0.40	1.00	46

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.96  
SUBAREA AREA(ACRES) = 23.90  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.48;6H= 3.72;24H= 6.53  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 18.9%  
 MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.03; LAG(HR) = 1.63; Fm(INCH/HR) = 0.23; Ybar = 0.39  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49915.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0219  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16035.24  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18463.30  
 TOTAL AREA(ACRES) = 49915.90 PEAK FLOW RATE(CFS) = 18571.53  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*

FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 121.96  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	1.30	0.40	0.10	32
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	15.30	0.40	1.00	49
NATURAL FAIR COVER					
"WOODLAND"	A	8.20	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	22.20	0.30	1.00	63
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	0.50	0.30	0.50	56
NATURAL FAIR COVER					
"GRASS"	B	65.20	0.30	1.00	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.32  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 112.70  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.48;6H= 3.71;24H= 6.53  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.0%  
 MOUNTAIN= 63.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.03; LAG(HR) = 1.63; Fm(INCH/HR) = 0.23; Ybar = 0.39  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 50028.60  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0219  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16040.85  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18471.54  
 TOTAL AREA(ACRES) = 50028.60 PEAK FLOW RATE(CFS) = 18571.53  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*

FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 121.96  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	2.30	0.30	1.00	65
URBAN FAIR COVER					
"TURF"	B	18.50	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	30.20	0.30	1.00	66
COMMERCIAL	B	5.60	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	19.10	0.30	1.00	69
NATURAL FAIR COVER					
"WOODLAND"	B	13.40	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
 SUBAREA AREA(ACRES) = 89.10  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.48;6H= 3.71;24H= 6.52  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.1%  
 MOUNTAIN= 63.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.03; LAG(HR) = 1.63; Fm(INCH/HR) = 0.23; Ybar = 0.39  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 50117.70  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0219  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16047.77  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18480.56  
 TOTAL AREA(ACRES) = 50117.70 PEAK FLOW RATE(CFS) = 18571.53  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*

FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 121.96  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	C	236.40	0.25	1.00	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	0.40	0.25	0.50	69
NATURAL FAIR COVER					
"GRASS"	C	74.30	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	195.50	0.25	1.00	77
COMMERCIAL	C	0.40	0.25	0.10	69
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	C	8.60	0.25	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 515.60  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.48;6H= 3.70;24H= 6.50

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.5%  
MOUNTAIN= 63.5%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.03; LAG(HR) = 1.63; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 50633.30  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0219  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16118.74  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18557.12  
TOTAL AREA(ACRES) = 50633.30 PEAK FLOW RATE(CFS) = 18571.53  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 121.96

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	4.00	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	61.90	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	139.90	0.20	1.00	81
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	5.20	0.20	0.50	75
NATURAL FAIR COVER					
"GRASS"	D	97.60	0.20	1.00	84
URBAN FAIR COVER					
"TURF"	D	5.60	0.20	1.00	82

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99

SUBAREA AREA(ACRES) = 314.20

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.47;6H= 3.70;24H= 6.49

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.7%

MOUNTAIN= 63.2%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.03; LAG(HR) = 1.63; Fm(INCH/HR) = 0.23; Ybar = 0.40

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;

3HR = 0.78; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 50947.50

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0219

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16172.39

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18614.00

TOTAL AREA(ACRES) = 50947.50 PEAK FLOW RATE(CFS) = 18614.00

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 121.96

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	D	191.80	0.20	1.00	83
COMMERCIAL	D	4.40	0.20	0.10	75
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	17.10	0.20	1.00	84
PUBLIC PARK	D	7.90	0.20	0.85	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	1.50	0.20	1.00	86
NATURAL FAIR COVER					
"WOODLAND"	D	56.50	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98

SUBAREA AREA(ACRES) = 279.20

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.47;6H= 3.69;24H= 6.48

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.9%

MOUNTAIN= 63.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.03; LAG(HR) = 1.63; Fm(INCH/HR) = 0.23; Ybar = 0.40

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;

3HR = 0.78; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51226.70

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0219

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16223.98

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18667.86

TOTAL AREA(ACRES) = 51226.70 PEAK FLOW RATE(CFS) = 18667.86

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

=====  
END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 51226.70 TC(MIN.) = 121.96

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.40

PEAK FLOW RATE(CFS) = 18667.86

=====  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LE65100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.020  
FOOTHILL 0.150  
MOUNTAIN 0.070  
VALLEY(UNDEVELOPED)/DESERT 0.760  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LE64100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18667.86 Tc(MIN.) = 121.96  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.40  
TOTAL AREA(ACRES) = 51226.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18667.86 Tc(MIN.) = 121.96  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.40  
TOTAL AREA(ACRES) = 51226.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 275.00 DOWNSTREAM(FEET) = 240.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5738.00 CHANNEL SLOPE = 0.0061  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 18667.86  
FLOW VELOCITY(FEET/SEC.) = 19.47 FLOW DEPTH(FEET) = 11.54  
TRAVEL TIME(MIN.) = 4.91 Tc(MIN.) = 126.87  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 126.87  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.970  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	3.80	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	20.30	0.40	0.50	32
NATURAL POOR COVER					
"BARREN"	A	0.90	0.40	1.00	78
NATURAL FAIR COVER					
"GRASS"	A	29.30	0.40	1.00	50
URBAN FAIR COVER					
"TURF"	A	0.80	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	3.30	0.40	1.00	46

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.83  
SUBAREA AREA(ACRES) = 58.40  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.47;6H= 3.69;24H= 6.48  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 20.0%  
 MOUNTAIN= 63.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.40  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51285.10  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16224.84  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18450.98  
 TOTAL AREA(ACRES) = 51285.10 PEAK FLOW RATE(CFS) = 18667.86  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 126.87  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.90	0.40	0.10	32
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	47.10	0.40	1.00	49
NATURAL FAIR COVER					
"WOODLAND"	A	9.80	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	8.90	0.30	1.00	63
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	15.00	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	9.70	0.30	1.00	86

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.37  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.91  
 SUBAREA AREA(ACRES) = 91.40  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.47;6H= 3.69;24H= 6.47  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 20.1%  
 MOUNTAIN= 62.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.40  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51376.49  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16227.16  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18455.88  
 TOTAL AREA(ACRES) = 51376.49 PEAK FLOW RATE(CFS) = 18667.86  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 126.87  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	B	61.80	0.30	1.00	69
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	30.20	0.30	1.00	65
URBAN FAIR COVER					
"TURF"	B	0.70	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	56.20	0.30	1.00	66
COMMERCIAL	B	3.90	0.30	0.10	56
PUBLIC PARK	B	10.90	0.30	0.85	56

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97  
 SUBAREA AREA(ACRES) = 163.70  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.47;6H= 3.68;24H= 6.47  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 20.2%  
 MOUNTAIN= 62.7%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.40  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51540.19  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16239.60  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18472.03  
 TOTAL AREA(ACRES) = 51540.19 PEAK FLOW RATE(CFS) = 18667.86  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 126.87  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	0.70	0.30	1.00	69
NATURAL FAIR COVER					
"WOODLAND"	B	65.20	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	C	210.40	0.25	1.00	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	9.60	0.25	0.50	69
NATURAL POOR COVER					
"BARREN"	C	14.70	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	145.30	0.25	1.00	79

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 445.90  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.46;6H= 3.68;24H= 6.45



S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 20.7%  
MOUNTAIN= 62.2%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.40  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51986.09  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16296.38  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18535.01  
TOTAL AREA(ACRES) = 51986.09 PEAK FLOW RATE(CFS) = 18667.86  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 126.87

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	C	6.50	0.25	1.00	77
URBAN FAIR COVER					
"TURF"	C	0.70	0.25	1.00	77
NATURAL FAIR COVER					
"OPEN BRUSH"	C	350.80	0.25	1.00	77
COMMERCIAL	C	4.00	0.25	0.10	69
PUBLIC PARK	C	47.00	0.25	0.85	69
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	60.40	0.25	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98

SUBAREA AREA(ACRES) = 469.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.31;3H= 2.46;6H= 3.67;24H= 6.43

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.2%

MOUNTAIN= 61.7%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.40

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.39; 1HR = 0.43;

3HR = 0.78; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52455.49

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16363.74

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18607.00

TOTAL AREA(ACRES) = 52455.49 PEAK FLOW RATE(CFS) = 18667.86

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 126.87

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	C	0.40	0.25	1.00	79
NATURAL FAIR COVER					
"WOODLAND"	C	210.20	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	22.00	0.20	1.00	81
PUBLIC PARK	D	4.50	0.20	0.85	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	12.60	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	21.40	0.20	1.00	93

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97

SUBAREA AREA(ACRES) = 271.10

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.50;30M= 0.95;1H= 1.31;3H= 2.46;6H= 3.66;24H= 6.42

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.5%

MOUNTAIN= 61.4%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.40

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.39; 1HR = 0.43;

3HR = 0.78; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52726.59

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16400.94

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18648.07

TOTAL AREA(ACRES) = 52726.59 PEAK FLOW RATE(CFS) = 18667.86

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 126.87

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	D	136.70	0.20	1.00	84
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	10.20	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	3.30	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	93.70	0.20	1.00	83
COMMERCIAL	D	0.40	0.20	0.10	75
NATURAL GOOD COVER					
"MEADOWS"	D	10.00	0.20	1.00	78

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 254.30

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.50;30M= 0.95;1H= 1.31;3H= 2.45;6H= 3.66;24H= 6.41

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.7%

MOUNTAIN= 61.2%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.40  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52980.89  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16449.93  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18699.89  
 TOTAL AREA(ACRES) = 52980.89 PEAK FLOW RATE(CFS) = 18699.89

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*

FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 126.87

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	70.40	0.20	1.00	86
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	3.80	0.20	1.00	84
NATURAL FAIR COVER					
"WOODLAND"	D	68.20	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 142.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.50;30M= 0.95;1H= 1.31;3H= 2.45;6H= 3.66;24H= 6.41

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 61.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.40

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;

3HR = 0.77; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53123.29

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16476.89

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18728.97

TOTAL AREA(ACRES) = 53123.29 PEAK FLOW RATE(CFS) = 18728.97

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 53123.29 TC(MIN.) = 126.87

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.40

PEAK FLOW RATE(CFS) = 18728.97

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LE66100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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

\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 7.600
- 2) 10.000; 4.500
- 3) 15.000; 3.500
- 4) 20.000; 2.750
- 5) 30.000; 2.100
- 6) 60.000; 1.520
- 7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.020
FOOTHILL	0.080
MOUNTAIN	0.680
VALLEY(UNDEVELOPED)/DESERT	0.220
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LE65100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18728.97 Tc(MIN.) = 126.87  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.40  
TOTAL AREA(ACRES) = 53123.29  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18728.97 Tc(MIN.) = 126.87  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.40  
TOTAL AREA(ACRES) = 53123.29  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 240.00 DOWNSTREAM(FEET) = 213.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6295.00 CHANNEL SLOPE = 0.0043  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 18728.97  
FLOW VELOCITY(FEET/SEC.) = 14.43 FLOW DEPTH(FEET) = 11.92  
TRAVEL TIME(MIN.) = 7.27 Tc(MIN.) = 134.14  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

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MAINLINE Tc(MIN) = 134.14  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.940  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	A	19.80	0.40	0.85	32
AGRICULTURAL POOR COVER "FALLOW"	A	2.20	0.40	1.00	77
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	17.60	0.40	0.50	32
NATURAL POOR COVER "BARREN"	A	67.40	0.40	1.00	78
NATURAL FAIR COVER "GRASS"	A	59.40	0.40	1.00	50
URBAN FAIR COVER "TURF"	A	39.00	0.40	1.00	44

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
SUBAREA AREA(ACRES) = 205.40  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.50;30M= 0.95;1H= 1.31;3H= 2.45;6H= 3.65;24H= 6.40

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
MOUNTAIN= 61.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.40  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53328.69  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16483.12  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18371.73  
TOTAL AREA(ACRES) = 53328.69 PEAK FLOW RATE(CFS) = 18728.97  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 134.14  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	A	9.30	0.40	1.00	46
COMMERCIAL	A	17.30	0.40	0.10	32
NATURAL GOOD COVER					
"MEADOWS"	A	0.40	0.40	1.00	30
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	69.80	0.40	1.00	49
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	3.60	0.40	1.00	40
NATURAL FAIR COVER					
"WOODLAND"	A	108.30	0.40	1.00	36

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
SUBAREA AREA(ACRES) = 208.70

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.50;30M= 0.95;1H= 1.31;3H= 2.45;6H= 3.65;24H= 6.39  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
MOUNTAIN= 61.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.40  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53537.39  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16475.89  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18369.11  
TOTAL AREA(ACRES) = 53537.39 PEAK FLOW RATE(CFS) = 18728.97  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 134.14  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	104.10	0.30	1.00	63
NATURAL GOOD COVER					
"MEADOWS"	B	28.00	0.30	1.00	58
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	179.50	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	235.20	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	338.30	0.30	1.00	69
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	37.70	0.30	1.00	65

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
SUBAREA AREA(ACRES) = 922.80

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.50;30M= 0.94;1H= 1.31;3H= 2.44;6H= 3.63;24H= 6.36  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
MOUNTAIN= 61.2%;FOOTHILL= 14.9%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.41  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 54460.19  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16591.00  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18477.81  
TOTAL AREA(ACRES) = 54460.19 PEAK FLOW RATE(CFS) = 18728.97  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 134.14  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN FAIR COVER					
"TURF"	B	139.20	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	151.00	0.30	1.00	66
COMMERCIAL	B	352.90	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	215.10	0.30	1.00	69
PUBLIC PARK	B	22.20	0.30	0.85	56
NATURAL FAIR COVER					
"CHAPARRAL, NARROWLEAF"	B	2.40	0.30	1.00	72

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.64  
SUBAREA AREA(ACRES) = 882.80

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.50;30M= 0.94;1H= 1.31;3H= 2.43;6H= 3.62;24H= 6.33  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 61.3%;FOOTHILL= 14.8%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.41  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 55342.99  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16736.24  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18622.94  
 TOTAL AREA(ACRES) = 55342.99 PEAK FLOW RATE(CFS) = 18728.97  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 134.14

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	B	259.40	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	277.70	0.25	1.00	75
AGRICULTURAL POOR COVER					
"FALLOW"	C	90.50	0.25	1.00	91
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	233.10	0.25	0.50	69
NATURAL POOR COVER					
"BARREN"	C	196.30	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	706.70	0.25	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
 SUBAREA AREA(ACRES) = 1763.70  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.50;30M= 0.94;1H= 1.30;3H= 2.42;6H= 3.59;24H= 6.27  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 61.5%;FOOTHILL= 14.6%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.41  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.32; 30M = 0.37; 1HR = 0.42;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 57106.69  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 17009.26  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18873.00  
 TOTAL AREA(ACRES) = 57106.69 PEAK FLOW RATE(CFS) = 18873.00

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 134.14

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL GOOD COVER					
"MEADOWS"	C	4.00	0.25	1.00	71
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	29.00	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	359.50	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	154.40	0.20	1.00	81
PUBLIC PARK	D	46.70	0.20	0.85	75
AGRICULTURAL POOR COVER					
"FALLOW"	D	38.90	0.20	1.00	94

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 632.50  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.29;3H= 2.39;6H= 3.54;24H= 6.18  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 61.9%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.41  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	C	12.40	0.25	1.00	77
URBAN FAIR COVER					
"TURF"	C	53.80	0.25	1.00	77
NATURAL FAIR COVER					
"OPEN BRUSH"	C	1739.10	0.25	1.00	77
COMMERCIAL	C	417.20	0.25	0.10	69
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	C	258.40	0.25	1.00	79
PUBLIC PARK	C	1.50	0.25	0.85	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.85  
 SUBAREA AREA(ACRES) = 2482.40  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.30;3H= 2.40;6H= 3.55;24H= 6.20  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 61.8%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.41  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.37; 1HR = 0.41;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 59589.09  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 17443.23  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19282.80  
 TOTAL AREA(ACRES) = 59589.09 PEAK FLOW RATE(CFS) = 19282.80

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 134.14

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL GOOD COVER					
"MEADOWS"	C	4.00	0.25	1.00	71
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	29.00	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	359.50	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	154.40	0.20	1.00	81
PUBLIC PARK	D	46.70	0.20	0.85	75
AGRICULTURAL POOR COVER					
"FALLOW"	D	38.90	0.20	1.00	94

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 632.50  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.29;3H= 2.39;6H= 3.54;24H= 6.18  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 61.9%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.41  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.37; 1HR = 0.41;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 60221.59  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 17538.86  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19373.94  
 TOTAL AREA(ACRES) = 60221.59 PEAK FLOW RATE(CFS) = 19373.94

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 134.14  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "5-7 DWELLINGS/ACRE"	D	13.30	0.20	0.50	75
NATURAL POOR COVER "BARREN"	D	33.60	0.20	1.00	93
NATURAL FAIR COVER "GRASS"	D	223.80	0.20	1.00	84
AGRICULTURAL FAIR COVER "ORCHARDS"	D	87.20	0.20	1.00	82
URBAN FAIR COVER "TURF"	D	6.00	0.20	1.00	82
NATURAL FAIR COVER "OPEN BRUSH"	D	420.00	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 783.90

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.29;3H= 2.39;6H= 3.53;24H= 6.16  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 61.9%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.41

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 61005.48  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 17693.77  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19516.37  
 TOTAL AREA(ACRES) = 61005.48 PEAK FLOW RATE(CFS) = 19516.37

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 134.14  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
COMMERCIAL	D	35.20	0.20	0.10	75
NATURAL GOOD COVER "MEADOWS"	D	1.60	0.20	1.00	78
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	20.20	0.20	1.00	86
AGRICULTURAL FAIR COVER "PASTURE,DRYLAND"	D	281.40	0.20	1.00	84
NATURAL FAIR COVER "WOODLAND"	D	83.00	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.92  
 SUBAREA AREA(ACRES) = 421.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.29;3H= 2.38;6H= 3.53;24H= 6.15  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.41

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 61426.88  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 17779.16  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19595.49  
 TOTAL AREA(ACRES) = 61426.88 PEAK FLOW RATE(CFS) = 19595.49

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

=====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 61426.88 TC(MIN.) = 134.14  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.41  
 PEAK FLOW RATE(CFS) = 19595.49

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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-----  
FILE NAME: LE67100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--  
  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.020  
FOOTHILL 0.140  
MOUNTAIN 0.620  
VALLEY(UNDEVELOPED)/DESERT 0.220  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME:	LE66100E.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:	
PEAK FLOW RATE(CFS) =	19595.49 Tc(MIN.) = 134.14
AREA-AVERAGED Fm(INCH/HR) =	0.23 Ybar = 0.41
TOTAL AREA(ACRES) =	61426.88
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE 1066.00 = ***** FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 19595.49 Tc(MIN.) = 134.14  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.41  
TOTAL AREA(ACRES) = 61426.88  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 213.00 DOWNSTREAM(FEET) = 176.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6201.00 CHANNEL SLOPE = 0.0060  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 19595.49  
FLOW VELOCITY(FEET/SEC.) = 16.39 FLOW DEPTH(FEET) = 11.14  
TRAVEL TIME(MIN.) = 6.30 Tc(MIN.) = 140.44  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 140.44  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.915  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER					
"FALLOW"	A	0.20	0.40	1.00	77
NATURAL FAIR COVER					
"GRASS"	A	0.90	0.40	1.00	50
NATURAL FAIR COVER					
"OPEN BRUSH"	A	8.90	0.40	1.00	46
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	5.50	0.40	1.00	49
NATURAL FAIR COVER					
"WOODLAND"	A	17.90	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	11.60	0.30	1.00	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.37  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 45.00  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.29;3H= 2.38;6H= 3.53;24H= 6.15  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.23; Ybar = 0.41  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 61471.88  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 17778.02  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19434.76  
 TOTAL AREA(ACRES) = 61471.88 PEAK FLOW RATE(CFS) = 19595.49  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 140.44  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER "FALLOW"	B	450.40	0.30	1.00	86
RESIDENTIAL "5-7 DWELLINGS/ACRE"	B	77.20	0.30	0.50	56
NATURAL FAIR COVER "GRASS"	B	47.20	0.30	1.00	69
AGRICULTURAL FAIR COVER "ORCHARDS"	B	22.50	0.30	1.00	65
URBAN FAIR COVER "TURF"	B	5.30	0.30	1.00	65
NATURAL FAIR COVER "OPEN BRUSH"	B	156.70	0.30	1.00	66

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
 SUBAREA AREA(ACRES) = 759.30

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.29;3H= 2.38;6H= 3.52;24H= 6.13  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.23; Ybar = 0.41  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 62231.18  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 17897.19  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19537.22  
 TOTAL AREA(ACRES) = 62231.18 PEAK FLOW RATE(CFS) = 19595.49  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
 \*\*\*\*\*  
 MAINLINE Tc(MIN) = 140.44  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL AGRICULTURAL FAIR COVER "PASTURE, DRYLAND"	B	6.20	0.30	0.10	56
PUBLIC PARK NATURAL GOOD COVER "MEADOWS"	B	0.20	0.30	0.85	56
B	1.80	0.30	1.00	58	
NATURAL FAIR COVER "CHAPARRAL, NARROWLEAF"	B	1.60	0.30	1.00	72
NATURAL FAIR COVER "WOODLAND"	B	71.30	0.30	1.00	60

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 610.90

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.49;30M= 0.93;1H= 1.29;3H= 2.37;6H= 3.51;24H= 6.11  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.23; Ybar = 0.42  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.40;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 62842.08  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 17949.69  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19588.50  
 TOTAL AREA(ACRES) = 62842.08 PEAK FLOW RATE(CFS) = 19595.49  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 140.44  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	C	132.80	0.25	1.00	75
AGRICULTURAL POOR COVER "FALLOW"	C	226.40	0.25	1.00	91
NATURAL POOR COVER "BARREN"	C	8.70	0.25	1.00	91
NATURAL FAIR COVER "GRASS"	C	379.30	0.25	1.00	79
AGRICULTURAL FAIR COVER "ORCHARDS"	C	0.70	0.25	1.00	77
NATURAL FAIR COVER "OPEN BRUSH"	C	1062.60	0.25	1.00	77

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1810.50  
 UNIT-HYDROGRAPH DATA:



RAINFALL(INCH): 5M= 0.49;30M= 0.93;1H= 1.28;3H= 2.36;6H= 3.49;24H= 6.07  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.23; Ybar = 0.42  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.35; 1HR = 0.40;  
3HR = 0.75; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 64652.58  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18233.79  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19846.29  
TOTAL AREA(ACRES) = 64652.58 PEAK FLOW RATE(CFS) = 19846.29

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 140.44

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	10.80	0.25	0.10	69
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	C	206.00	0.25	1.00	79
NATURAL GOOD COVER					
"MEADOWS"	C	0.20	0.25	1.00	71
NATURAL FAIR COVER					
"WOODLAND"	C	116.80	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	D	30.80	0.20	1.00	81
AGRICULTURAL POOR COVER					
"FALLOW"	D	158.40	0.20	1.00	94

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98

SUBAREA AREA(ACRES) = 523.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.36;6H= 3.48;24H= 6.05

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.23; Ybar = 0.42

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 65175.58

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18328.79

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19932.34

TOTAL AREA(ACRES) = 65175.58 PEAK FLOW RATE(CFS) = 19932.34

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 140.44

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	59.00	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	0.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	444.70	0.20	1.00	84
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	5.30	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	4.00	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	461.60	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97

SUBAREA AREA(ACRES) = 975.20

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.35;6H= 3.47;24H= 6.03

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.23; Ybar = 0.42

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66150.78

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18515.30

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20106.75

TOTAL AREA(ACRES) = 66150.78 PEAK FLOW RATE(CFS) = 20106.75

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 140.44

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	D	2.70	0.20	0.10	75
PUBLIC PARK	D	0.10	0.20	0.85	75
NATURAL GOOD COVER					
"MEADOWS"	D	0.60	0.20	1.00	78
NATURAL FAIR COVER					
"CHAPARRAL, NARROWLEAF"	D	9.10	0.20	1.00	86
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	D	368.40	0.20	1.00	84
NATURAL FAIR COVER					
"WOODLAND"	D	79.50	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99

SUBAREA AREA(ACRES) = 460.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.35;6H= 3.46;24H= 6.02

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.23; Ybar = 0.42

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66611.18  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18601.38  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20186.73  
TOTAL AREA(ACRES) = 66611.18 PEAK FLOW RATE(CFS) = 20186.73

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 66611.18 TC(MIN.) = 140.44  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.42  
PEAK FLOW RATE(CFS) = 20186.73

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LE68100E.DAT  
TIME/DATE OF STUDY: 09:31 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.020  
FOOTHILL 0.140  
MOUNTAIN 0.190  
VALLEY(UNDEVELOPED)/DESERT 0.650  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LE67100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 20186.73 Tc(MIN.) = 140.44  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.42  
TOTAL AREA(ACRES) = 66611.18  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 20186.73 Tc(MIN.) = 140.44  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.42  
TOTAL AREA(ACRES) = 66611.18  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 176.00 DOWNSTREAM(FEET) = 133.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6324.00 CHANNEL SLOPE = 0.0068  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 20186.73  
FLOW VELOCITY(FEET/SEC.) = 17.30 FLOW DEPTH(FEET) = 10.92  
TRAVEL TIME(MIN.) = 6.09 Tc(MIN.) = 146.53  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 146.53  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.893  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	2.20	0.40	1.00	40
AGRICULTURAL POOR COVER					
"FALLOW"	A	5.20	0.40	1.00	77
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.20	0.40	0.50	32
NATURAL FAIR COVER					
"GRASS"	A	6.20	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	15.80	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	3.10	0.40	1.00	46

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 32.70  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.35;6H= 3.46;24H= 6.02  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.23; Ybar = 0.42  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR = 0.93  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66643.88  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18600.79  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19979.84  
 TOTAL AREA(ACRES) = 66643.88 PEAK FLOW RATE(CFS) = 20186.73  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 146.53  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	4.90	0.40	0.10	32
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	31.60	0.40	1.00	49
NATURAL FAIR COVER					
"WOODLAND"	A	21.00	0.40	1.00	36
AGRICULTURAL POOR COVER					
"FALLOW"	B	22.40	0.30	1.00	86
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	19.00	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	2.00	0.30	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.36  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.86  
 SUBAREA AREA(ACRES) = 100.90

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.35;6H= 3.46;24H= 6.02  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.0%  
 MOUNTAIN= 61.9%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.23; Ybar = 0.42  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR = 0.93  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66744.78  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18607.47  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19987.47  
 TOTAL AREA(ACRES) = 66744.78 PEAK FLOW RATE(CFS) = 20186.73  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 146.53  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	B	20.90	0.30	1.00	69
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	30.90	0.30	1.00	65
URBAN FAIR COVER					
"TURF"	B	0.70	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	1.10	0.30	1.00	66
COMMERCIAL	B	8.00	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	65.80	0.30	1.00	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
 SUBAREA AREA(ACRES) = 127.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.35;6H= 3.46;24H= 6.01  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.1%  
 MOUNTAIN= 61.8%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.23; Ybar = 0.42  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR = 0.93  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66872.18  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18619.09  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20000.11  
 TOTAL AREA(ACRES) = 66872.18 PEAK FLOW RATE(CFS) = 20186.73  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 146.53  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	B	0.40	0.30	0.85	56
NATURAL FAIR COVER					
"WOODLAND"	B	11.80	0.30	1.00	60
NATURAL FAIR COVER					
"GRASS"	C	222.20	0.25	1.00	79
AGRICULTURAL FAIR COVER					
"ORCHARDS"	C	5.10	0.25	1.00	77
NATURAL FAIR COVER					
"OPEN BRUSH"	C	71.50	0.25	1.00	77
COMMERCIAL	C	2.90	0.25	0.10	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 313.90

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.34;6H= 3.46;24H= 6.01  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.3%

MOUNTAIN= 61.6%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.23; Ybar = 0.42  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 67186.08  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18664.58  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20044.99  
TOTAL AREA(ACRES) = 67186.08 PEAK FLOW RATE(CFS) = 20186.73  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 146.53

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
PUBLIC PARK C 0.70 0.25 0.85 69  
NATURAL FAIR COVER  
"WOODLAND" C 22.40 0.25 1.00 73  
AGRICULTURAL POOR COVER  
"FALLOW" D 104.40 0.20 1.00 94  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" D 142.90 0.20 0.50 75  
NATURAL POOR COVER  
"BARREN" D 0.60 0.20 1.00 93  
NATURAL FAIR COVER  
"GRASS" D 421.50 0.20 1.00 84  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
SUBAREA AREA(ACRES) = 692.50

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.34;6H= 3.45;24H= 5.99  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.7%  
MOUNTAIN= 61.2%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.23; Ybar = 0.42  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 67878.58  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18807.66  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20184.10  
TOTAL AREA(ACRES) = 67878.58 PEAK FLOW RATE(CFS) = 20186.73  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 146.53

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
AGRICULTURAL FAIR COVER  
"ORCHARDS" D 18.30 0.20 1.00 82  
URBAN FAIR COVER  
"TURF" D 6.30 0.20 1.00 82  
NATURAL FAIR COVER  
"OPEN BRUSH" D 188.90 0.20 1.00 83  
COMMERCIAL D 37.80 0.20 0.10 75  
AGRICULTURAL FAIR COVER  
"PASTURE, DRYLAND" D 9.80 0.20 1.00 84  
NATURAL FAIR COVER  
"WOODLAND" D 65.50 0.20 1.00 79  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
SUBAREA AREA(ACRES) = 326.60  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.34;6H= 3.45;24H= 5.98  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.9%  
MOUNTAIN= 61.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.23; Ybar = 0.42  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 68205.18  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18870.52  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20246.57  
TOTAL AREA(ACRES) = 68205.18 PEAK FLOW RATE(CFS) = 20246.57  
SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49  
=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 68205.18 TC(MIN.) = 146.53  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.42  
PEAK FLOW RATE(CFS) = 20246.57  
=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

**PRELIMINARY DRAFT – FOR INTERNAL USE ONLY**

**TECHNICAL APPENDIX I-B  
HYDROLOGIC ANALYSIS  
EXISTING CONDITION  
100-YEAR HIGH CONFIDENCE**

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LE63100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	10.000
2)	10.000;	6.000
3)	15.000;	4.500
4)	20.000;	3.600
5)	30.000;	2.750
6)	60.000;	1.950
7)	120.000;	1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.150
FOOTHILL	0.150
MOUNTAIN	0.640
VALLEY(UNDEVELOPED)/DESERT	0.060
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU62100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 26077.13 Tc(MIN.) = 106.69  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.32  
TOTAL AREA(ACRES) = 46437.31  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 26077.13 Tc(MIN.) = 106.69  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.32  
TOTAL AREA(ACRES) = 46437.31  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 345.00 DOWNSTREAM(FEET) = 319.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2852.00 CHANNEL SLOPE = 0.0091  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 26077.13  
FLOW VELOCITY(FEET/SEC.) = 24.77 FLOW DEPTH(FEET) = 12.41  
TRAVEL TIME(MIN.) = 1.92 Tc(MIN.) = 108.61  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 108.61  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.060  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	79.80	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	4.40	0.40	0.50	32
NATURAL FAIR COVER					
"GRASS"	A	8.00	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	6.40	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	110.10	0.40	1.00	46
COMMERCIAL	A	1.70	0.40	0.10	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98  
SUBAREA AREA(ACRES) = 210.40  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.65;30M= 1.22;1H= 1.70;3H= 3.20;6H= 4.78;24H= 8.47

S-GRAPH: VALLEY(DEV.)= 1.1%;VALLEY(UNDEV.)/DESERT= 19.8%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.81; LAG(HR) = 1.45; Fm(INCH/HR) = 0.23; Ybar = 0.33  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.91; 24HR= 0.95  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 46647.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0266; Lca/L=0.4,n=.0238; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204  
TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 21696.96  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26010.09  
TOTAL AREA(ACRES) = 46647.70 PEAK FLOW RATE(CFS) = 26077.13  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.55; 30M = 1.12; 1HR = 1.51; 3HR = 2.62; 6HR = 3.72; 24HR = 6.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 108.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.626  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"WOODLAND" A 56.90 0.40 1.00 36  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 7.50 0.30 1.00 63  
NATURAL FAIR COVER  
"GRASS" B 5.60 0.30 1.00 69  
AGRICULTURAL FAIR COVER  
"ORCHARDS" B 6.10 0.30 1.00 65  
NATURAL FAIR COVER  
"OPEN BRUSH" B 16.30 0.30 1.00 66  
COMMERCIAL B 1.90 0.30 0.10 56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.36

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98

SUBAREA AREA(ACRES) = 94.30

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.65;30M= 1.22;1H= 1.70;3H= 3.20;6H= 4.78;24H= 8.46

S-GRAPH: VALLEY(DEV.)= 1.1%;VALLEY(UNDEV.)/DESERT= 19.8%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.81; LAG(HR) = 1.45; Fm(INCH/HR) = 0.23; Ybar = 0.33

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.40; 1HR = 0.44;

3HR = 0.79; 6HR = 0.91; 24HR= 0.95

UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 46742.00

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0266; Lca/L=0.4,n=.0238; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204

TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 21703.18

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26023.51

TOTAL AREA(ACRES) = 46742.00 PEAK FLOW RATE(CFS) = 26077.13

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.55; 30M = 1.12; 1HR = 1.51; 3HR = 2.62; 6HR = 3.72; 24HR = 6.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 108.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.626

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "WOODLAND"	B	23.70	0.30	1.00	60
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	C	679.90	0.25	1.00	75
NATURAL POOR COVER "BARREN"	C	1.80	0.25	1.00	91
NATURAL FAIR COVER "GRASS"	C	161.40	0.25	1.00	79
NATURAL FAIR COVER "OPEN BRUSH"	C	1099.40	0.25	1.00	77
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	C	58.20	0.25	1.00	81

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 2024.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.69;3H= 3.18;6H= 4.74;24H= 8.37

S-GRAPH: VALLEY(DEV.)= 1.7%;VALLEY(UNDEV.)/DESERT= 19.2%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.81; LAG(HR) = 1.45; Fm(INCH/HR) = 0.23; Ybar = 0.33

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.35; 30M = 0.40; 1HR = 0.44;

3HR = 0.79; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 48766.40

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0266; Lca/L=0.4,n=.0238; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204

TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22242.15

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26584.84

TOTAL AREA(ACRES) = 48766.40 PEAK FLOW RATE(CFS) = 26584.84

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.55; 30M = 1.12; 1HR = 1.51; 3HR = 2.62; 6HR = 3.72; 24HR = 6.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 108.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.626

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "WOODLAND"	C	196.50	0.25	1.00	73
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	421.30	0.20	1.00	81
RESIDENTIAL "5-7 DWELLINGS/ACRE"	D	0.60	0.20	0.50	75
NATURAL POOR COVER "BARREN"	D	0.10	0.20	1.00	93
NATURAL FAIR COVER "GRASS"	D	55.70	0.20	1.00	84
NATURAL FAIR COVER "OPEN BRUSH"	D	270.30	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 944.50

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.69;3H= 3.17;6H= 4.72;24H= 8.34

S-GRAPH: VALLEY(DEV.)= 1.9%;VALLEY(UNDEV.)/DESERT= 18.9%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.81; LAG(HR) = 1.45; Fm(INCH/HR) = 0.23; Ybar = 0.33



USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 49710.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0266; Lca/L=0.4,n=.0238; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22520.65  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26871.62  
 TOTAL AREA(ACRES) = 49710.90 PEAK FLOW RATE(CFS) = 26871.62

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.55; 30M = 1.12; 1HR = 1.51; 3HR = 2.62; 6HR = 3.72; 24HR = 6.35

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

-----  
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
 =====

MAINLINE Tc(MIN) = 108.61  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.626  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	140.70	0.20	1.00	86
NATURAL FAIR COVER "WOODLAND"	D	40.40	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 181.10  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.16;6H= 4.71;24H= 8.33  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 18.9%  
 MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.81; LAG(HR) = 1.45; Fm(INCH/HR) = 0.23; Ybar = 0.33

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 49892.00  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0266; Lca/L=0.4,n=.0238; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22579.84  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26929.66  
 TOTAL AREA(ACRES) = 49892.00 PEAK FLOW RATE(CFS) = 26929.66

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.55; 30M = 1.12; 1HR = 1.51; 3HR = 2.62; 6HR = 3.72; 24HR = 6.35

-----  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 49892.00 TC(MIN.) = 108.61  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.33  
 PEAK FLOW RATE(CFS) = 26929.66  
 =====

-----  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LE64100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	10.000
2)	10.000;	6.000
3)	15.000;	4.500
4)	20.000;	3.600
5)	30.000;	2.750
6)	60.000;	1.950
7)	120.000;	1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.020
FOOTHILL	0.150
MOUNTAIN	0.260
VALLEY(UNDEVELOPED)/DESERT	0.570
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LE63100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 26929.66 Tc(MIN.) = 108.61  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 49892.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 26929.66 Tc(MIN.) = 108.61  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 49892.00  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 319.00 DOWNSTREAM(FEET) = 275.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5418.00 CHANNEL SLOPE = 0.0081  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 26929.66  
FLOW VELOCITY(FEET/SEC.) = 24.00 FLOW DEPTH(FEET) = 13.04  
TRAVEL TIME(MIN.) = 3.76 Tc(MIN.) = 112.37  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 112.37  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.040  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	0.60	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	1.70	0.40	0.50	32
NATURAL FAIR COVER					
"GRASS"	A	1.30	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	0.90	0.40	1.00	44
URBAN FAIR COVER					
"TURF"	A	18.90	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	0.50	0.40	1.00	46

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.96  
SUBAREA AREA(ACRES) = 23.90  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.16;6H= 4.71;24H= 8.33  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 18.9%  
 MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.87; LAG(HR) = 1.50; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 49915.90  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22579.42  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26637.42  
 TOTAL AREA(ACRES) = 49915.90 PEAK FLOW RATE(CFS) = 26929.66  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 112.37  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.601  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	1.30	0.40	0.10	32
AGRICULTURAL FAIR COVER "PASTURE, DRYLAND"	A	15.30	0.40	1.00	49
NATURAL FAIR COVER "WOODLAND"	A	8.20	0.40	1.00	36
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	B	22.20	0.30	1.00	63
RESIDENTIAL "5-7 DWELLINGS/ACRE"	B	0.50	0.30	0.50	56
NATURAL FAIR COVER "GRASS"	B	65.20	0.30	1.00	69

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.32  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 112.70  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.16;6H= 4.71;24H= 8.32  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.0%  
 MOUNTAIN= 63.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.87; LAG(HR) = 1.50; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 50028.60  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22591.39  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26654.89  
 TOTAL AREA(ACRES) = 50028.60 PEAK FLOW RATE(CFS) = 26929.66  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 112.37  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.601  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER "ORCHARDS"	B	2.30	0.30	1.00	65
URBAN FAIR COVER "TURF"	B	18.50	0.30	1.00	65
NATURAL FAIR COVER "OPEN BRUSH"	B	30.20	0.30	1.00	66
COMMERCIAL AGRICULTURAL FAIR COVER "PASTURE, DRYLAND"	B	5.60	0.30	0.10	56
NATURAL FAIR COVER "WOODLAND"	B	19.10	0.30	1.00	69
NATURAL FAIR COVER "WOODLAND"	B	13.40	0.30	1.00	60

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
 SUBAREA AREA(ACRES) = 89.10  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.16;6H= 4.71;24H= 8.32  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.1%  
 MOUNTAIN= 63.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.87; LAG(HR) = 1.50; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 50117.70  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22603.88  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26671.42  
 TOTAL AREA(ACRES) = 50117.70 PEAK FLOW RATE(CFS) = 26929.66  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 112.37  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.601  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	C	236.40	0.25	1.00	75
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	0.40	0.25	0.50	69
NATURAL FAIR COVER "GRASS"	C	74.30	0.25	1.00	79
NATURAL FAIR COVER "OPEN BRUSH"	C	195.50	0.25	1.00	77
COMMERCIAL AGRICULTURAL FAIR COVER "PASTURE, DRYLAND"	C	0.40	0.25	0.10	69
NATURAL FAIR COVER "PASTURE, DRYLAND"	C	8.60	0.25	1.00	79

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 515.60  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.15;6H= 4.69;24H= 8.29  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.5%  
 MOUNTAIN= 63.5%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.87; LAG(HR) = 1.50; Fm(INCH/HR) = 0.23; Ybar = 0.33

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 50633.30  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22711.57  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26790.26  
 TOTAL AREA(ACRES) = 50633.30 PEAK FLOW RATE(CFS) = 26929.66  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*

FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
 MAINLINE Tc(MIN) = 112.37  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.601  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 NATURAL FAIR COVER  
 "CHAPARRAL,NARROWLEAF" C 4.00 0.25 1.00 81  
 NATURAL FAIR COVER  
 "WOODLAND" C 61.90 0.25 1.00 73  
 NATURAL FAIR COVER  
 "CHAPARRAL,BROADLEAF" D 139.90 0.20 1.00 81  
 RESIDENTIAL  
 "5-7 DWELLINGS/ACRE" D 5.20 0.20 0.50 75  
 NATURAL FAIR COVER  
 "GRASS" D 97.60 0.20 1.00 84  
 URBAN FAIR COVER  
 "TURF" D 5.60 0.20 1.00 82

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99

SUBAREA AREA(ACRES) = 314.20

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.15;6H= 4.69;24H= 8.27  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.7%

MOUNTAIN= 63.2%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.87; LAG(HR) = 1.50; Fm(INCH/HR) = 0.23; Ybar = 0.33

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 50947.50  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22788.50

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26873.03

TOTAL AREA(ACRES) = 50947.50 PEAK FLOW RATE(CFS) = 26929.66

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*

FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
 MAINLINE Tc(MIN) = 112.37  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.601  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	D	191.80	0.20	1.00	83
COMMERCIAL	D	4.40	0.20	0.10	75
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	17.10	0.20	1.00	84
PUBLIC PARK	D	7.90	0.20	0.85	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	1.50	0.20	1.00	86
NATURAL FAIR COVER					
"WOODLAND"	D	56.50	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98

SUBAREA AREA(ACRES) = 279.20

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.14;6H= 4.68;24H= 8.26  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 19.9%

MOUNTAIN= 63.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.87; LAG(HR) = 1.50; Fm(INCH/HR) = 0.23; Ybar = 0.33

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 51226.70

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22861.11

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26949.73

TOTAL AREA(ACRES) = 51226.70 PEAK FLOW RATE(CFS) = 26949.73

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

-----  
 END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 51226.70 TC(MIN.) = 112.37

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.33

PEAK FLOW RATE(CFS) = 26949.73

-----  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LE65100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.020  
FOOTHILL 0.150  
MOUNTAIN 0.070  
VALLEY(UNDEVELOPED)/DESERT 0.760  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LE64100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 26949.73 Tc(MIN.) = 112.37  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 51226.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 26949.73 Tc(MIN.) = 112.37  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 51226.70  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 275.00 DOWNSTREAM(FEET) = 240.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5738.00 CHANNEL SLOPE = 0.0061  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 26949.73  
FLOW VELOCITY(FEET/SEC.) = 21.69 FLOW DEPTH(FEET) = 14.09  
TRAVEL TIME(MIN.) = 4.41 Tc(MIN.) = 116.78  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 116.78  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.017  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	3.80	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	20.30	0.40	0.50	32
NATURAL POOR COVER					
"BARREN"	A	0.90	0.40	1.00	78
NATURAL FAIR COVER					
"GRASS"	A	29.30	0.40	1.00	50
URBAN FAIR COVER					
"TURF"	A	0.80	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	3.30	0.40	1.00	46

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.83  
SUBAREA AREA(ACRES) = 58.40  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.14;6H= 4.68;24H= 8.26  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 20.0%  
 MOUNTAIN= 63.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.95; LAG(HR) = 1.56; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51285.10  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 22786.08  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26241.82  
 TOTAL AREA(ACRES) = 51285.10 PEAK FLOW RATE(CFS) = 26949.73  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 116.78  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.571  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	0.90	0.40	0.10	32
AGRICULTURAL FAIR COVER "PASTURE, DRYLAND"	A	47.10	0.40	1.00	49
NATURAL FAIR COVER "WOODLAND"	A	9.80	0.40	1.00	36
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	B	8.90	0.30	1.00	63
RESIDENTIAL "5-7 DWELLINGS/ACRE"	B	15.00	0.30	0.50	56
NATURAL POOR COVER "BARREN"	B	9.70	0.30	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.37  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.91  
 SUBAREA AREA(ACRES) = 91.40  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.14;6H= 4.67;24H= 8.25  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 20.1%  
 MOUNTAIN= 62.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.95; LAG(HR) = 1.56; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51376.49  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 22792.33  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26253.27  
 TOTAL AREA(ACRES) = 51376.49 PEAK FLOW RATE(CFS) = 26949.73  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 116.78  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.571  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "GRASS"	B	61.80	0.30	1.00	69
AGRICULTURAL FAIR COVER "ORCHARDS"	B	30.20	0.30	1.00	65
URBAN FAIR COVER "TURF"	B	0.70	0.30	1.00	65
NATURAL FAIR COVER "OPEN BRUSH"	B	56.20	0.30	1.00	66
COMMERCIAL	B	3.90	0.30	0.10	56
PUBLIC PARK	B	10.90	0.30	0.85	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97  
 SUBAREA AREA(ACRES) = 163.70  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.14;6H= 4.67;24H= 8.24  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 20.2%  
 MOUNTAIN= 62.7%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.95; LAG(HR) = 1.56; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51540.19  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 22814.58  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26282.35  
 TOTAL AREA(ACRES) = 51540.19 PEAK FLOW RATE(CFS) = 26949.73  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 116.78  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.571  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER "PASTURE, DRYLAND"	B	0.70	0.30	1.00	69
NATURAL FAIR COVER "WOODLAND"	B	65.20	0.30	1.00	60
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	C	210.40	0.25	1.00	75
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	9.60	0.25	0.50	69
NATURAL POOR COVER "BARREN"	C	14.70	0.25	1.00	91
NATURAL FAIR COVER "GRASS"	C	145.30	0.25	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 445.90  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.13;6H= 4.66;24H= 8.22  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 20.7%  
 MOUNTAIN= 62.2%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.95; LAG(HR) = 1.56; Fm(INCH/HR) = 0.23; Ybar = 0.34

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51986.09  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 22901.34  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26381.02  
 TOTAL AREA(ACRES) = 51986.09 PEAK FLOW RATE(CFS) = 26949.73  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 116.78  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.571  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 AGRICULTURAL FAIR COVER  
 "ORCHARDS" C 6.50 0.25 1.00 77  
 URBAN FAIR COVER  
 "TURF" C 0.70 0.25 1.00 77  
 NATURAL FAIR COVER  
 "OPEN BRUSH" C 350.80 0.25 1.00 77  
 COMMERCIAL C 4.00 0.25 0.10 69  
 PUBLIC PARK C 47.00 0.25 0.85 69  
 NATURAL FAIR COVER  
 "CHAPARRAL,NARROWLEAF" C 60.40 0.25 1.00 81  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98  
 SUBAREA AREA(ACRES) = 469.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.64;30M= 1.20;1H= 1.67;3H= 3.13;6H= 4.65;24H= 8.20  
 S-GRAPH: VALLEY(DEV.) = 2.0%;VALLEY(UNDEV.)/DESERT= 21.2%  
 MOUNTAIN= 61.7%;FOOTHILL= 15.1%;DESERT(UNDEV.) = 0.0%  
 Tc(HR) = 1.95; LAG(HR) = 1.56; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52455.49  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23001.47  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26490.53  
 TOTAL AREA(ACRES) = 52455.49 PEAK FLOW RATE(CFS) = 26949.73  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 116.78  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.571  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

AGRICULTURAL FAIR COVER  
 "PASTURE,DRYLAND" C 0.40 0.25 1.00 79  
 NATURAL FAIR COVER  
 "WOODLAND" C 210.20 0.25 1.00 73  
 NATURAL FAIR COVER  
 "CHAPARRAL,BROADLEAF" D 22.00 0.20 1.00 81  
 PUBLIC PARK D 4.50 0.20 0.85 75  
 RESIDENTIAL  
 "5-7 DWELLINGS/ACRE" D 12.60 0.20 0.50 75  
 NATURAL POOR COVER  
 "BARREN" D 21.40 0.20 1.00 93  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.24  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97  
 SUBAREA AREA(ACRES) = 271.10  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.20;1H= 1.67;3H= 3.12;6H= 4.64;24H= 8.18  
 S-GRAPH: VALLEY(DEV.) = 2.0%;VALLEY(UNDEV.)/DESERT= 21.5%  
 MOUNTAIN= 61.4%;FOOTHILL= 15.1%;DESERT(UNDEV.) = 0.0%  
 Tc(HR) = 1.95; LAG(HR) = 1.56; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52726.59  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23057.20  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26553.54  
 TOTAL AREA(ACRES) = 52726.59 PEAK FLOW RATE(CFS) = 26949.73  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 116.78  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.571  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
 NATURAL FAIR COVER  
 "GRASS" D 136.70 0.20 1.00 84  
 AGRICULTURAL FAIR COVER  
 "ORCHARDS" D 10.20 0.20 1.00 82  
 URBAN FAIR COVER  
 "TURF" D 3.30 0.20 1.00 82  
 NATURAL FAIR COVER  
 "OPEN BRUSH" D 93.70 0.20 1.00 83  
 COMMERCIAL D 0.40 0.20 0.10 75  
 NATURAL GOOD COVER  
 "MEADOWS" D 10.00 0.20 1.00 78  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 254.30

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.64;30M= 1.20;1H= 1.67;3H= 3.12;6H= 4.63;24H= 8.17  
 S-GRAPH: VALLEY(DEV.) = 2.0%;VALLEY(UNDEV.)/DESERT= 21.7%  
 MOUNTAIN= 61.2%;FOOTHILL= 15.1%;DESERT(UNDEV.) = 0.0%  
 Tc(HR) = 1.95; LAG(HR) = 1.56; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52980.89  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23125.46  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26627.06  
TOTAL AREA(ACRES) = 52980.89 PEAK FLOW RATE(CFS) = 26949.73  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81  
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

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DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	70.40	0.20	1.00	86
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	3.80	0.20	1.00	84
NATURAL FAIR COVER					
"WOODLAND"	D	68.20	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 142.40  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.64;30M= 1.20;1H= 1.67;3H= 3.12;6H= 4.63;24H= 8.16  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
MOUNTAIN= 61.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.95; LAG(HR) = 1.56; Fm(INCH/HR) = 0.23; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53123.29  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23163.23  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26668.55  
TOTAL AREA(ACRES) = 53123.29 PEAK FLOW RATE(CFS) = 26949.73  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 53123.29 TC(MIN.) = 116.78  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.34  
PEAK FLOW RATE(CFS) = 26949.73

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LE66100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.020  
FOOTHILL 0.080  
MOUNTAIN 0.680  
VALLEY(UNDEVELOPED)/DESERT 0.220  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LE65100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 26949.73 Tc(MIN.) = 116.78  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.34  
TOTAL AREA(ACRES) = 53123.29  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 26949.73 Tc(MIN.) = 116.78  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.34  
TOTAL AREA(ACRES) = 53123.29  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 240.00 DOWNSTREAM(FEET) = 213.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6295.00 CHANNEL SLOPE = 0.0043  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 26949.73  
FLOW VELOCITY(FEET/SEC.) = 16.15 FLOW DEPTH(FEET) = 14.61  
TRAVEL TIME(MIN.) = 6.50 Tc(MIN.) = 123.27  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 123.27  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.986  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	A	19.80	0.40	0.85	32
AGRICULTURAL POOR COVER "FALLOW"	A	2.20	0.40	1.00	77
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	17.60	0.40	0.50	32
NATURAL POOR COVER "BARREN"	A	67.40	0.40	1.00	78
NATURAL FAIR COVER "GRASS"	A	59.40	0.40	1.00	50
URBAN FAIR COVER "TURF"	A	39.00	0.40	1.00	44

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
SUBAREA AREA(ACRES) = 205.40  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.20;1H= 1.67;3H= 3.12;6H= 4.63;24H= 8.15

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
MOUNTAIN= 61.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53328.69  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23178.63  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26430.38  
TOTAL AREA(ACRES) = 53328.69 PEAK FLOW RATE(CFS) = 26949.73  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 123.27  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	A	9.30	0.40	1.00	46
COMMERCIAL	A	17.30	0.40	0.10	32
NATURAL GOOD COVER					
"MEADOWS"	A	0.40	0.40	1.00	30
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	69.80	0.40	1.00	49
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	3.60	0.40	1.00	40
NATURAL FAIR COVER					
"WOODLAND"	A	108.30	0.40	1.00	36

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
SUBAREA AREA(ACRES) = 208.70  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.20;1H= 1.67;3H= 3.11;6H= 4.62;24H= 8.14  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
MOUNTAIN= 61.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53537.39  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23176.88  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26440.02  
TOTAL AREA(ACRES) = 53537.39 PEAK FLOW RATE(CFS) = 26949.73  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 123.27  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	104.10	0.30	1.00	63
NATURAL GOOD COVER					
"MEADOWS"	B	28.00	0.30	1.00	58
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	179.50	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	235.20	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	338.30	0.30	1.00	69
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	37.70	0.30	1.00	65

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
SUBAREA AREA(ACRES) = 922.80  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.63;30M= 1.20;1H= 1.66;3H= 3.10;6H= 4.60;24H= 8.10  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
MOUNTAIN= 61.2%;FOOTHILL= 14.9%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 54460.19  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23352.57  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26613.17  
TOTAL AREA(ACRES) = 54460.19 PEAK FLOW RATE(CFS) = 26949.73  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 123.27  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN FAIR COVER					
"TURF"	B	139.20	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	151.00	0.30	1.00	66
COMMERCIAL	B	352.90	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	215.10	0.30	1.00	69
PUBLIC PARK	B	22.20	0.30	0.85	56
NATURAL FAIR COVER					
"CHAPARRAL, NARROWLEAF"	B	2.40	0.30	1.00	72

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.64  
SUBAREA AREA(ACRES) = 882.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.20;1H= 1.66;3H= 3.09;6H= 4.58;24H= 8.06  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 61.3%;FOOTHILL= 14.8%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 55342.99  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23558.20  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26825.03  
 TOTAL AREA(ACRES) = 55342.99 PEAK FLOW RATE(CFS) = 26949.73  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 123.27

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	B	259.40	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	277.70	0.25	1.00	75
AGRICULTURAL POOR COVER					
"FALLOW"	C	90.50	0.25	1.00	91
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	233.10	0.25	0.50	69
NATURAL POOR COVER					
"BARREN"	C	196.30	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	706.70	0.25	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
 SUBAREA AREA(ACRES) = 1763.70

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.63;30M= 1.19;1H= 1.65;3H= 3.07;6H= 4.54;24H= 7.99  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 61.5%;FOOTHILL= 14.6%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.32; 30M = 0.37; 1HR = 0.42;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 57106.69  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23954.83  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 27199.14  
 TOTAL AREA(ACRES) = 57106.69 PEAK FLOW RATE(CFS) = 27199.14

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 123.27

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	C	12.40	0.25	1.00	77
URBAN FAIR COVER					
"TURF"	C	53.80	0.25	1.00	77
NATURAL FAIR COVER					
"OPEN BRUSH"	C	1739.10	0.25	1.00	77
COMMERCIAL	C	417.20	0.25	0.10	69
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	C	258.40	0.25	1.00	79
PUBLIC PARK	C	1.50	0.25	0.85	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.85  
 SUBAREA AREA(ACRES) = 2482.40  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.65;3H= 3.04;6H= 4.49;24H= 7.89  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 61.8%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.37; 1HR = 0.41;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 59589.09  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 24571.89  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 27795.62  
 TOTAL AREA(ACRES) = 59589.09 PEAK FLOW RATE(CFS) = 27795.62

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 123.27

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL GOOD COVER					
"MEADOWS"	C	4.00	0.25	1.00	71
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	29.00	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	359.50	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	154.40	0.20	1.00	81
PUBLIC PARK	D	46.70	0.20	0.85	75
AGRICULTURAL POOR COVER					
"FALLOW"	D	38.90	0.20	1.00	94

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 632.50

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.04;6H= 4.48;24H= 7.87  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 61.9%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.37; 1HR = 0.41;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 60221.59  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 24712.89  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 27934.25  
 TOTAL AREA(ACRES) = 60221.59 PEAK FLOW RATE(CFS) = 27934.25

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 123.27  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "5-7 DWELLINGS/ACRE"	D	13.30	0.20	0.50	75
NATURAL POOR COVER "BARREN"	D	33.60	0.20	1.00	93
NATURAL FAIR COVER "GRASS"	D	223.80	0.20	1.00	84
AGRICULTURAL FAIR COVER "ORCHARDS"	D	87.20	0.20	1.00	82
URBAN FAIR COVER "TURF"	D	6.00	0.20	1.00	82
NATURAL FAIR COVER "OPEN BRUSH"	D	420.00	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 783.90

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.03;6H= 4.47;24H= 7.84  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 61.9%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 61005.48  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 24928.08  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28135.48  
 TOTAL AREA(ACRES) = 61005.48 PEAK FLOW RATE(CFS) = 28135.48

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 123.27  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550

SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ SCS SOIL	AREA	Fp	Ap	SCS
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LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
COMMERCIAL	D	35.20	0.20	0.10	75
NATURAL GOOD COVER "MEADOWS"	D	1.60	0.20	1.00	78
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	20.20	0.20	1.00	86
AGRICULTURAL FAIR COVER "PASTURE,DRYLAND"	D	281.40	0.20	1.00	84
NATURAL FAIR COVER "WOODLAND"	D	83.00	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.92  
 SUBAREA AREA(ACRES) = 421.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.03;6H= 4.46;24H= 7.82  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 61426.88  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 25045.90  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28246.52  
 TOTAL AREA(ACRES) = 61426.88 PEAK FLOW RATE(CFS) = 28246.52

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63  
 =====

END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 61426.88 TC(MIN.) = 123.27  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.35  
 PEAK FLOW RATE(CFS) = 28246.52  
 =====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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-----  
FILE NAME: LE67100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	10.000
2)	10.000;	6.000
3)	15.000;	4.500
4)	20.000;	3.600
5)	30.000;	2.750
6)	60.000;	1.950
7)	120.000;	1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
===

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.020
FOOTHILL	0.140
MOUNTAIN	0.620
VALLEY(UNDEVELOPED)/DESERT	0.220
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LE66100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 28246.52 Tc(MIN.) = 123.27  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.35  
TOTAL AREA(ACRES) = 61426.88  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 28246.52 Tc(MIN.) = 123.27  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.35  
TOTAL AREA(ACRES) = 61426.88  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 213.00 DOWNSTREAM(FEET) = 176.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6201.00 CHANNEL SLOPE = 0.0060  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 28246.52  
FLOW VELOCITY(FEET/SEC.) = 18.37 FLOW DEPTH(FEET) = 13.68  
TRAVEL TIME(MIN.) = 5.63 Tc(MIN.) = 128.90  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 128.90  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.961  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER					
"FALLOW"	A	0.20	0.40	1.00	77
NATURAL FAIR COVER					
"GRASS"	A	0.90	0.40	1.00	50
NATURAL FAIR COVER					
"OPEN BRUSH"	A	8.90	0.40	1.00	46
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	5.50	0.40	1.00	49
NATURAL FAIR COVER					
"WOODLAND"	A	17.90	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	11.60	0.30	1.00	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.37  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 45.00  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.03;6H= 4.46;24H= 7.82  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 61471.88  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 25046.21  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 27865.75  
 TOTAL AREA(ACRES) = 61471.88 PEAK FLOW RATE(CFS) = 28246.52  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 128.90  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER "FALLOW"	B	450.40	0.30	1.00	86
RESIDENTIAL "5-7 DWELLINGS/ACRE"	B	77.20	0.30	0.50	56
NATURAL FAIR COVER "GRASS"	B	47.20	0.30	1.00	69
AGRICULTURAL FAIR COVER "ORCHARDS"	B	22.50	0.30	1.00	65
URBAN FAIR COVER "TURF"	B	5.30	0.30	1.00	65
NATURAL FAIR COVER "OPEN BRUSH"	B	156.70	0.30	1.00	66

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
 SUBAREA AREA(ACRES) = 759.30  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.02;6H= 4.45;24H= 7.79  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 62231.18  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 25220.12  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28021.79  
 TOTAL AREA(ACRES) = 62231.18 PEAK FLOW RATE(CFS) = 28246.52  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
 \*\*\*\*\*  
 MAINLINE Tc(MIN) = 128.90  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL AGRICULTURAL FAIR COVER	B	6.20	0.30	0.10	56
"PASTURE, DRYLAND"	B	529.80	0.30	1.00	69
PUBLIC PARK NATURAL GOOD COVER	B	0.20	0.30	0.85	56
"MEADOWS" NATURAL FAIR COVER	B	1.80	0.30	1.00	58
"CHAPARRAL, NARROWLEAF" NATURAL FAIR COVER	B	1.60	0.30	1.00	72
"WOODLAND"	B	71.30	0.30	1.00	60

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 610.90  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.01;6H= 4.43;24H= 7.77  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.40;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 62842.08  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 25310.91  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28113.49  
 TOTAL AREA(ACRES) = 62842.08 PEAK FLOW RATE(CFS) = 28246.52  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 128.90  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	C	132.80	0.25	1.00	75
AGRICULTURAL POOR COVER "FALLOW"	C	226.40	0.25	1.00	91
NATURAL POOR COVER "BARREN"	C	8.70	0.25	1.00	91
NATURAL FAIR COVER "GRASS"	C	379.30	0.25	1.00	79
AGRICULTURAL FAIR COVER "ORCHARDS"	C	0.70	0.25	1.00	77
NATURAL FAIR COVER "OPEN BRUSH"	C	1062.60	0.25	1.00	77

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 1810.50  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.63;3H= 3.00;6H= 4.40;24H= 7.71  
 S-GGRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 64652.58  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 25727.77  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28502.73  
 TOTAL AREA(ACRES) = 64652.58 PEAK FLOW RATE(CFS) = 28502.73

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 128.90

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	10.80	0.25	0.10	69
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	C	206.00	0.25	1.00	79
NATURAL GOOD COVER					
"MEADOWS"	C	0.20	0.25	1.00	71
NATURAL FAIR COVER					
"WOODLAND"	C	116.80	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	D	30.80	0.20	1.00	81
AGRICULTURAL POOR COVER					
"FALLOW"	D	158.40	0.20	1.00	94

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.23

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98

SUBAREA AREA(ACRES) = 523.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.63;3H= 2.99;6H= 4.40;24H= 7.70

S-GGRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.23; Ybar = 0.35

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.35; 1HR = 0.40;

3HR = 0.74; 6HR = 0.89; 24HR= 0.93

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 65175.58

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 25861.60

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28627.29

TOTAL AREA(ACRES) = 65175.58 PEAK FLOW RATE(CFS) = 28627.29

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 128.90

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	59.00	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	0.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	444.70	0.20	1.00	84
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	5.30	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	4.00	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	461.60	0.20	1.00	83

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.97

SUBAREA AREA(ACRES) = 975.20

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.63;3H= 2.98;6H= 4.38;24H= 7.67

S-GGRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.23; Ybar = 0.35

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;

3HR = 0.74; 6HR = 0.89; 24HR= 0.93

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66150.78

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26122.21

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28874.75

TOTAL AREA(ACRES) = 66150.78 PEAK FLOW RATE(CFS) = 28874.75

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 128.90

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	D	2.70	0.20	0.10	75
PUBLIC PARK	D	0.10	0.20	0.85	75
NATURAL GOOD COVER					
"MEADOWS"	D	0.60	0.20	1.00	78
NATURAL FAIR COVER					
"CHAPARRAL, NARROWLEAF"	D	9.10	0.20	1.00	86
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	D	368.40	0.20	1.00	84
NATURAL FAIR COVER					
"WOODLAND"	D	79.50	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99

SUBAREA AREA(ACRES) = 460.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.63;3H= 2.98;6H= 4.37;24H= 7.65

S-GGRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.23; Ybar = 0.35

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66611.18  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26243.14  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28988.89  
TOTAL AREA(ACRES) = 66611.18 PEAK FLOW RATE(CFS) = 28988.89

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 66611.18 TC(MIN.) = 128.90  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.35  
PEAK FLOW RATE(CFS) = 28988.89

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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-----  
FILE NAME: LE68100H.DAT  
TIME/DATE OF STUDY: 09:43 02/17/2004  
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USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.020  
FOOTHILL 0.140  
MOUNTAIN 0.190  
VALLEY(UNDEVELOPED)/DESERT 0.650  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME:	LE67100H.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:	
PEAK FLOW RATE(CFS) =	28988.89 Tc(MIN.) = 128.90
AREA-AVERAGED Fm(INCH/HR) =	0.23 Ybar = 0.35
TOTAL AREA(ACRES) =	66611.18
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE 1067.00 = ***** FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 28988.89 Tc(MIN.) = 128.90  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.35  
TOTAL AREA(ACRES) = 66611.18  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 176.00 DOWNSTREAM(FEET) = 133.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6324.00 CHANNEL SLOPE = 0.0068  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 28988.89  
FLOW VELOCITY(FEET/SEC.) = 19.37 FLOW DEPTH(FEET) = 13.39  
TRAVEL TIME(MIN.) = 5.44 Tc(MIN.) = 134.34  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 134.34  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.939  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	2.20	0.40	1.00	40
AGRICULTURAL POOR COVER					
"FALLOW"	A	5.20	0.40	1.00	77
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.20	0.40	0.50	32
NATURAL FAIR COVER					
"GRASS"	A	6.20	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	15.80	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	3.10	0.40	1.00	46

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 32.70  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.63;3H= 2.98;6H= 4.37;24H= 7.65  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 21.9%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66643.88  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26243.62  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28594.47  
 TOTAL AREA(ACRES) = 66643.88 PEAK FLOW RATE(CFS) = 28988.89  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 134.34  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	A	4.90	0.40	0.10	32
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	31.60	0.40	1.00	49
NATURAL FAIR COVER					
"WOODLAND"	A	21.00	0.40	1.00	36
AGRICULTURAL POOR COVER					
"FALLOW"	B	22.40	0.30	1.00	86
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	19.00	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	2.00	0.30	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.36  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.86  
 SUBAREA AREA(ACRES) = 100.90

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.63;3H= 2.98;6H= 4.37;24H= 7.65  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.0%  
 MOUNTAIN= 61.9%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66744.78  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26254.98  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28607.84  
 TOTAL AREA(ACRES) = 66744.78 PEAK FLOW RATE(CFS) = 28988.89  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 134.34  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	B	20.90	0.30	1.00	69
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	30.90	0.30	1.00	65
URBAN FAIR COVER					
"TURF"	B	0.70	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	1.10	0.30	1.00	66
COMMERCIAL	B	8.00	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	65.80	0.30	1.00	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
 SUBAREA AREA(ACRES) = 127.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.62;3H= 2.98;6H= 4.37;24H= 7.64  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.1%  
 MOUNTAIN= 61.8%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.36  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66872.18  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26274.48  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28629.00  
 TOTAL AREA(ACRES) = 66872.18 PEAK FLOW RATE(CFS) = 28988.89  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 134.34  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	B	0.40	0.30	0.85	56
NATURAL FAIR COVER					
"WOODLAND"	B	11.80	0.30	1.00	60
NATURAL FAIR COVER					
"GRASS"	C	222.20	0.25	1.00	79
AGRICULTURAL FAIR COVER					
"ORCHARDS"	C	5.10	0.25	1.00	77
NATURAL FAIR COVER					
"OPEN BRUSH"	C	71.50	0.25	1.00	77
COMMERCIAL	C	2.90	0.25	0.10	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 313.90

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.62;3H= 2.97;6H= 4.37;24H= 7.63  
 S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.3%

MOUNTAIN= 61.6%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.36  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 67186.08  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26342.26  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28696.71  
TOTAL AREA(ACRES) = 67186.08 PEAK FLOW RATE(CFS) = 28988.89  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 134.34

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	C	0.70	0.25	0.85	69
NATURAL FAIR COVER					
"WOODLAND"	C	22.40	0.25	1.00	73
AGRICULTURAL POOR COVER					
"FALLOW"	D	104.40	0.20	1.00	94
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	142.90	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	0.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	421.50	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
SUBAREA AREA(ACRES) = 692.50

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.62;3H= 2.97;6H= 4.36;24H= 7.61  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.7%  
MOUNTAIN= 61.2%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.36  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 67878.58  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26538.25  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28888.66  
TOTAL AREA(ACRES) = 67878.58 PEAK FLOW RATE(CFS) = 28988.89  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 134.34

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	18.30	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	6.30	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	188.90	0.20	1.00	83
COMMERCIAL	D	37.80	0.20	0.10	75
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	D	9.80	0.20	1.00	84
NATURAL FAIR COVER					
"WOODLAND"	D	65.50	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
SUBAREA AREA(ACRES) = 326.60

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.62;3H= 2.97;6H= 4.35;24H= 7.60  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 22.9%

MOUNTAIN= 61.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.36  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 68205.18  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26625.69  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28975.75  
TOTAL AREA(ACRES) = 68205.18 PEAK FLOW RATE(CFS) = 28988.89  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

-----  
END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 68205.18 TC(MIN.) = 134.34  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.36  
PEAK FLOW RATE(CFS) = 28988.89

-----  
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

**PRELIMINARY DRAFT – FOR INTERNAL USE ONLY**

**TECHNICAL APPENDIX I-C  
HYDROLOGIC ANALYSIS  
PROPOSED CONDITION  
2-YEAR EXPECTED VALUE**

Hydrologic Analyses of Upstream Areas not Contemplated to be  
Developed are not Duplicated in this Technical Appendix  
See Technical Appendix I-A

## Rainfall Depths

### 2-Year - Expected Value - Proposed Condition

Subarea	Area			Rainfall Depth						Node	Area			Rainfall Depth					
	(ac)	< 2000 (ac)	> 2000 (ac)	5-min	30-min	1-hr	3-hr	6-hr	24-hr		(ac)	< 2000 (ac)	> 2000 (ac)	5-min	30-min	1-hr	3-hr	6-hr	24-hr
		X		0.13	0.28	0.37	0.62	0.85	1.44			X		0.13	0.28	0.37	0.62	0.85	1.44
			X	0.18	0.32	0.46	0.94	1.46	2.67			X		0.18	0.32	0.46	0.94	1.46	2.67
1062	3,450.7	3,010.5	440.2	0.14	0.29	0.38	0.66	0.93	1.60	1063	49,889.3	26,015.3	23,874.0	0.15	0.30	0.41	0.77	1.14	2.03
1063	1,647.5	1,647.5	0.0	0.13	0.28	0.37	0.62	0.85	1.44	1064	51,536.8	27,662.8	23,874.0	0.15	0.30	0.41	0.77	1.13	2.01
1064	1,712.0	1,712.0	0.0	0.13	0.28	0.37	0.62	0.85	1.44	1065	53,248.8	29,374.8	23,874.0	0.15	0.30	0.41	0.76	1.12	1.99
1065	8,253.4	8,253.4	0.0	0.13	0.28	0.37	0.62	0.85	1.44	1066	61,502.2	37,628.2	23,874.0	0.15	0.30	0.40	0.74	1.09	1.92
1066	5,184.3	5,184.3	0.0	0.13	0.28	0.37	0.62	0.85	1.44	1067	66,686.5	42,812.5	23,874.0	0.15	0.29	0.40	0.73	1.07	1.88
1067	1,560.1	1,560.1	0.0	0.13	0.28	0.37	0.62	0.85	1.44	1068	68,246.6	44,372.6	23,874.0	0.15	0.29	0.40	0.73	1.06	1.87

## Channel Hydraulics, Travel Times, Times of Concentration, and Lag Estimates 2-Year - Expected Value - Proposed Condition

U/S Node	D/S Node	U/S Elevation	D/S Elevation	Length (ft)	Manning (n)	Base (ft)	Sideslope (z)	Height (ft)	Q(2) (cfs)	Dn (ft)	V (fps)	Tt (min)	Tc (min)	Lag (hr)
1062	1063	345	319	2852	0.025	60	2	15	1,943	2.81	10.56	4.50	233.98	3.12
1063	1064	319	275	5418	0.025	60	2	15	2,025	2.97	10.32	8.75	242.72	3.24
1064	1065	275	240	5738	0.025	60	2	15	2,054	3.26	9.46	10.11	252.83	3.37
1065	1066	240	213	6295	0.030	85	2	15	2,076	3.32	6.82	15.38	268.21	3.58
1066	1067	213	176	6201	0.030	85	2	15	2,252	3.16	7.80	13.25	281.46	3.75
1067	1068	176	133	6324	0.030	85	2	15	2,254	3.04	8.13	12.96	294.42	3.93

## Losses

Node P1063  
 Total Area (ac) 49,887.8  
 24-Hour Rainfall Depth (in) 2.03  
 Fm (in/hr) 0.59  
 Y-Bar 0.72

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	1.3	0.2	0.0	0.0	18.7	75.6	163.8	234.9
11+ Dwellings / Acre	20	32	56	69	75	0.0	6.9	80.9	1.9	0.0	6.9	80.9	1.9
5-7 Dwellings / Acre	50	32	56	69	75	4.4	0.0	0.0	0.6	15.2	3.6	49.7	28.8
3-4 Dwellings / Acre	60	32	56	69	75	12.9	4.2	28.7	16.7	12.9	4.2	28.7	16.7
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.0	0.0	6.2	8.9	3.6
Barren (Poor)	100	78	86	91	93	0.0	0.0	1.8	0.1	7.1	7.8	78.2	121.6
Chaparral, Broadleaf (Fair)	100	40	63	75	81	88.7	7.1	656.1	420.9	427.4	738.7	#####	9,918.5
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	54.2	139.4	49.6	41.5	2,571.2	6,193.1
Grass (Fair)	100	50	69	79	84	6.5	5.6	156.5	48.3	70.8	76.4	545.9	1,058.8
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Open Brush (Fair)	100	46	66	77	83	98.1	11.6	1,039.1	261.4	486.0	299.9	5,015.2	4,824.9
Woodland (Fair)	100	36	60	73	79	48.4	19.0	189.0	40.0	750.3	410.4	1,501.1	2,087.4
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	2.2	0.0	0.0	0.2
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	1.3	10.0	87.0	57.8

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.25	0.43	0.59	0.66
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.05	0.19	0.31
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.01	0.15	0.31	0.43
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.11	0.27	0.38
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.12	0.29	0.38
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.02	0.14	0.25
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.08	0.23	0.35
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.03	0.16	0.27
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.23	0.43	0.59	0.70
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.23	0.33
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.11	0.27	0.38
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.23	0.33



## Losses

Node P1064  
 Total Area (ac) 51,534.9  
 24-Hour Rainfall Depth (in) 2.01  
 Fm (in/hr) 0.59  
 Y-Bar 0.72

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.2	33.0	38.3	51.3	18.9	108.6	202.1	286.2
11+ Dwellings / Acre	20	32	56	69	75	4.8	15.5	180.6	154.7	4.8	22.4	261.5	156.6
5-7 Dwellings / Acre	50	32	56	69	75	0.0	0.0	1.7	0.8	15.2	3.6	51.4	29.6
3-4 Dwellings / Acre	60	32	56	69	75	0.0	0.0	0.0	1.3	12.9	4.2	28.7	18.0
Public Park	85	32	56	69	75	0.0	0.0	0.0	7.9	0.0	6.2	8.9	11.5
Barren (Poor)	100	78	86	91	93	0.0	0.0	0.0	0.0	7.1	7.8	78.2	121.6
Chaparral, Broadleaf (Fair)	100	40	63	75	81	51.8	99.6	242.7	160.0	479.2	838.3	#####	#####
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	21.3	24.2	49.6	41.5	2,592.5	6,217.3
Grass (Fair)	100	50	69	79	84	0.2	14.7	27.2	28.0	71.0	91.1	573.1	1,086.8
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Open Brush (Fair)	100	46	66	77	83	0.0	20.0	172.2	171.4	486.0	319.9	5,187.4	4,996.3
Woodland (Fair)	100	36	60	73	79	1.6	7.4	48.4	53.6	751.9	417.8	1,549.5	2,141.0
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.2	0.0	0.0	0.0	2.4	0.0	0.0	0.2
Pasture, Dryland (Fair)	100	49	69	79	84	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Turf (Fair)	100	44	65	77	82	0.0	0.0	12.1	0.4	1.3	10.0	99.1	58.2

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.24	0.43	0.58	0.66
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.05	0.19	0.30
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.01	0.15	0.30	0.43
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.11	0.26	0.37
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.12	0.28	0.37
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.02	0.13	0.24
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.08	0.23	0.35
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.03	0.16	0.26
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.23	0.43	0.58	0.70
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.23	0.33
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.11	0.26	0.37
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.23	0.33

## Losses

Node P1065  
 Total Area (ac) 53,246.8  
 24-Hour Rainfall Depth (in) 1.99  
 Fm (in/hr) 0.58  
 Y-Bar 0.72

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.9	3.9	4.2	0.4	19.8	112.5	206.3	286.6
11+ Dwellings / Acre	20	32	56	69	75	43.5	60.3	93.0	68.9	48.3	82.7	354.5	225.5
5-7 Dwellings / Acre	50	32	56	69	75	0.2	0.0	0.0	0.0	15.4	3.6	51.4	29.6
3-4 Dwellings / Acre	60	32	56	69	75	0.0	82.1	529.2	109.8	12.9	86.3	557.9	127.8
Public Park	85	32	56	69	75	0.0	0.2	0.0	1.8	0.0	6.4	8.9	13.3
Barren (Poor)	100	78	86	91	93	0.0	0.7	0.0	0.7	7.1	8.5	78.2	122.3
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	6.7	111.4	1.9	479.2	845.0	#####	#####
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	49.6	41.5	2,592.5	6,217.3
Grass (Fair)	100	50	69	79	84	11.3	36.1	42.1	39.6	82.3	127.2	615.2	1,126.4
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.0	0.0	2.0	0.0	0.0	0.0	2.2
Open Brush (Fair)	100	46	66	77	83	0.7	30.5	117.7	55.0	486.7	350.4	5,305.1	5,051.3
Woodland (Fair)	100	36	60	73	79	6.9	44.6	106.5	31.7	758.8	462.4	1,656.0	2,172.7
Fallow (Poor)	100	77	86	91	94	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.0	2.4	0.0	0.0	0.2
Pasture, Dryland (Fair)	100	49	69	79	84	49.5	1.8	0.2	11.7	49.5	1.8	0.2	11.7
Turf (Fair)	100	44	65	77	82	0.0	0.4	0.5	3.3	1.3	10.4	99.6	61.5

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.11	0.19
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.24	0.42	0.58	0.66
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.05	0.19	0.30
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.01	0.14	0.30	0.42
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.11	0.26	0.37
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.12	0.28	0.37
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.02	0.13	0.24
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.08	0.22	0.35
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.03	0.16	0.26
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.22	0.42	0.58	0.70
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.22	0.32
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.11	0.26	0.37
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.07	0.22	0.32

## Losses

Node P1066  
 Total Area (ac) 61,499.9  
 24-Hour Rainfall Depth (in) 1.92  
 Fm (in/hr) 0.57  
 Y-Bar 0.72

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	17.3	352.9	417.3	35.5	37.1	465.4	623.6	322.1
11+ Dwellings / Acre	20	32	56	69	75	7.1	85.9	460.8	357.3	55.4	168.6	815.3	582.8
5-7 Dwellings / Acre	50	32	56	69	75	13.3	201.9	322.3	91.5	28.7	205.5	373.7	121.1
3-4 Dwellings / Acre	60	32	56	69	75	0.0	76.7	228.4	309.7	12.9	163.0	786.3	437.5
Public Park	85	32	56	69	75	19.8	22.2	0.7	44.5	19.8	28.6	9.6	57.8
Barren (Poor)	100	78	86	91	93	56.0	189.5	117.8	9.6	63.1	198.0	196.0	131.9
Chaparral, Broadleaf (Fair)	100	40	63	75	81	1.3	119.3	252.2	112.9	480.5	964.3	#####	#####
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	2.4	26.1	11.3	49.6	43.9	2,618.6	6,228.6
Grass (Fair)	100	50	69	79	84	51.4	335.8	615.7	204.0	133.7	463.0	1,230.9	1,330.4
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.4	0.0	4.0	1.6	0.4	0.0	4.0	3.8
Open Brush (Fair)	100	46	66	77	83	4.0	113.3	1,315.5	171.9	490.7	463.7	6,620.6	5,223.2
Woodland (Fair)	100	36	60	73	79	101.4	223.6	211.8	41.7	860.2	686.0	1,867.8	2,214.4
Fallow (Poor)	100	77	86	91	94	2.2	19.8	67.2	12.5	2.2	22.5	67.2	12.5
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	0.0	0.0	0.4	2.4	0.0	0.0	0.6
Pasture, Dryland (Fair)	100	49	69	79	84	120.0	174.0	183.9	95.9	169.5	175.8	184.1	107.6
Turf (Fair)	100	44	65	77	82	20.2	139.2	52.4	5.8	21.5	149.6	152.0	67.3

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.10	0.18
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.10	0.18
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.10	0.18
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.10	0.18
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.10	0.18
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.23	0.41	0.57	0.65
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.04	0.18	0.29
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.00	0.14	0.29	0.41
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.10	0.25	0.36
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.11	0.27	0.36
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.02	0.12	0.23
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.07	0.21	0.33
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.02	0.15	0.25
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.21	0.41	0.57	0.69
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.06	0.21	0.31
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.10	0.25	0.36
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.06	0.21	0.31

## Losses

Node P1067  
 Total Area (ac) 66,684.6  
 24-Hour Rainfall Depth (in) 1.88  
 Fm (in/hr) 0.57  
 Y-Bar 0.73

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	0.0	7.8	10.8	11.7	37.1	473.2	634.4	333.8
11+ Dwellings / Acre	20	32	56	69	75	0.0	0.0	17.9	3.8	55.4	168.6	833.2	586.6
5-7 Dwellings / Acre	50	32	56	69	75	0.0	89.6	0.0	104.6	28.7	295.1	373.7	225.7
3-4 Dwellings / Acre	60	32	56	69	75	0.0	50.9	125.4	156.1	12.9	213.9	911.7	593.6
Public Park	85	32	56	69	75	0.0	0.0	0.0	0.1	19.8	28.6	9.6	57.9
Barren (Poor)	100	78	86	91	93	0.0	0.0	7.6	0.6	63.1	198.0	203.6	132.5
Chaparral, Broadleaf (Fair)	100	40	63	75	81	0.0	23.9	203.6	159.9	480.5	988.2	#####	#####
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.4	0.0	7.8	49.6	44.3	2,618.6	6,236.4
Grass (Fair)	100	50	69	79	84	0.9	327.5	485.3	635.3	134.6	790.5	1,716.2	1,965.7
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.0	0.9	0.2	0.0	0.4	0.9	4.2	3.8
Open Brush (Fair)	100	46	66	77	83	8.9	118.9	940.0	334.5	499.6	582.6	7,560.6	5,557.7
Woodland (Fair)	100	36	60	73	79	17.9	51.7	94.1	63.8	878.1	737.7	1,961.9	2,278.2
Fallow (Poor)	100	77	86	91	94	0.2	180.4	124.3	77.9	2.4	202.9	191.5	90.4
Orchards, Evergreen (Fair)	100	44	65	77	82	0.0	6.0	0.7	0.9	2.4	6.0	0.7	1.5
Pasture, Dryland (Fair)	100	49	69	79	84	5.5	418.8	128.1	61.4	175.0	594.6	312.2	169.0
Turf (Fair)	100	44	65	77	82	0.0	105.0	4.9	8.2	21.5	254.6	156.9	75.5

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.22	0.40	0.56	0.64
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.04	0.17	0.28
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.00	0.13	0.28	0.40
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.09	0.24	0.35
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.10	0.26	0.35
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.01	0.12	0.22
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.06	0.20	0.33
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.02	0.14	0.24
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.20	0.40	0.56	0.68
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.06	0.20	0.30
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.09	0.24	0.35
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.06	0.20	0.30

## Losses

Node P1068  
 Total Area (ac) 68,244.9  
 24-Hour Rainfall Depth (in) 1.87  
 Fm (in/hr) 0.56  
 Y-Bar 0.73

Description	Ap %	Curve Number (AMC II)				Subarea (ac)				Total (ac)			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial	10	32	56	69	75	23.3	42.8	12.9	60.2	60.4	516.0	647.3	394.0
11+ Dwellings / Acre	20	32	56	69	75	6.7	77.6	0.0	143.9	62.1	246.2	833.2	730.5
5-7 Dwellings / Acre	50	32	56	69	75	0.0	16.5	0.0	140.2	28.7	311.6	373.7	365.9
3-4 Dwellings / Acre	60	32	56	69	75	33.6	14.9	0.9	6.0	46.5	228.8	912.6	599.6
Public Park	85	32	56	69	75	0.0	0.0	0.2	0.0	19.8	28.6	9.8	57.9
Barren (Poor)	100	78	86	91	93	0.0	2.0	0.0	0.6	63.1	200.0	203.6	133.1
Chaparral, Broadleaf (Fair)	100	40	63	75	81	1.3	0.0	0.0	4.9	481.8	988.2	#####	#####
Chaparral, Narrowleaf (Fair)	100	55	72	81	86	0.0	0.0	0.0	0.0	49.6	44.3	2,618.6	6,236.4
Grass (Fair)	100	50	69	79	84	1.8	7.1	218.6	332.2	136.4	797.6	1,934.8	2,297.9
Meadows or Cienegas (Fair)	100	51	70	80	84	0.0	0.0	0.0	0.0	0.0	0.0	3.8	3.3
Meadows or Cienegas (Good)	100	30	58	71	78	0.3	0.0	0.0	0.0	0.7	0.9	4.2	3.8
Open Brush (Fair)	100	46	66	77	83	3.1	0.7	70.8	172.8	502.7	583.3	7,631.4	5,730.5
Woodland (Fair)	100	36	60	73	79	19.3	6.9	19.5	61.3	897.4	744.6	1,981.4	2,339.5
Fallow (Poor)	100	77	86	91	94	0.0	4.1	0.0	35.6	2.4	207.0	191.5	126.0
Orchards, Evergreen (Fair)	100	44	65	77	82	0.9	0.4	0.0	1.1	3.3	6.4	0.7	2.6
Pasture, Dryland (Fair)	100	49	69	79	84	1.6	10.7	0.0	1.8	176.6	605.3	312.2	170.8
Turf (Fair)	100	44	65	77	82	0.0	0.0	0.0	1.2	21.5	254.6	156.9	76.7

Description		S				Ia				Y			
		A	B	C	D	A	B	C	D	A	B	C	D
Commercial		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
11+ Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
5-7 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
3-4 Dwellings / Acre		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
Public Park		21.25	7.86	4.49	3.33	4.25	1.57	0.90	0.67	0.00	0.01	0.09	0.17
Impervious		0.20	0.20	0.20	0.20	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88
Barren (Poor)		2.82	1.63	0.99	0.75	0.56	0.33	0.20	0.15	0.22	0.40	0.56	0.64
Chaparral, Broadleaf (Fair)		15.00	5.87	3.33	2.35	3.00	1.17	0.67	0.47	0.00	0.04	0.17	0.28
Chaparral, Narrowleaf (Fair)		8.18	3.89	2.35	1.63	1.64	0.78	0.47	0.33	0.00	0.13	0.28	0.40
Grass (Fair)		10.00	4.49	2.66	1.90	2.00	0.90	0.53	0.38	0.00	0.09	0.24	0.35
Meadows or Cienegas (Fair)		9.61	4.29	2.50	1.90	1.92	0.86	0.50	0.38	0.00	0.10	0.26	0.35
Meadows or Cienegas (Good)		23.33	7.24	4.08	2.82	4.67	1.45	0.82	0.56	0.00	0.01	0.12	0.22
Open Brush (Fair)		11.74	5.15	2.99	2.05	2.35	1.03	0.60	0.41	0.00	0.06	0.20	0.33
Woodland (Fair)		17.78	6.67	3.70	2.66	3.56	1.33	0.74	0.53	0.00	0.02	0.14	0.24
Fallow (Poor)		2.99	1.63	0.99	0.64	0.60	0.33	0.20	0.13	0.20	0.40	0.56	0.68
Orchards, Evergreen (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.05	0.20	0.30
Pasture, Dryland (Fair)		10.41	4.49	2.66	1.90	2.08	0.90	0.53	0.38	0.00	0.09	0.24	0.35
Turf (Fair)		12.73	5.38	2.99	2.20	2.55	1.08	0.60	0.44	0.00	0.05	0.20	0.30

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LP63002E.FLD  
 TIME/DATE OF STUDY: 15:45 02/25/2004

\*\*\*\*\*

FLOW PROCESS FROM NODE 1000.00 TO NODE 1063.00 IS CODE = 1

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 >>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<  
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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 49887.801 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 3.120 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.020  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.150  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.640  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.190  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.590  
 LOW LOSS FRACTION = 0.730  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.15  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.30  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.41  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.77  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.14  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.03

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.343  
 30-MINUTE FACTOR = 0.394  
 1-HOUR FACTOR = 0.434  
 3-HOUR FACTOR = 0.784  
 6-HOUR FACTOR = 0.903  
 24-HOUR FACTOR = 0.943

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.671

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.261	1576.609
2	0.784	3153.218
3	1.307	3153.218
4	1.827	3141.831
5	2.343	3112.965
6	2.891	3304.287
7	3.632	4469.873
8	4.405	4664.420
9	5.184	4700.477
10	5.989	4855.007
11	6.812	4967.741
12	7.829	6136.500
13	8.893	6418.659
14	10.041	6925.066
15	11.316	7693.297
16	12.608	7793.017
17	14.081	8886.960
18	15.619	9278.368
19	17.434	10955.126
20	19.181	10535.374
21	20.820	9894.031
22	22.939	12780.177
23	25.173	13483.200
24	27.079	11499.126
25	28.948	11275.061
26	30.513	9438.917
27	32.220	10302.840
28	33.975	10588.206
29	35.563	9581.864
30	37.017	8769.381
31	38.608	9601.657
32	40.274	10049.603
33	41.822	9337.534
34	43.349	9215.048
35	45.037	10182.884
36	46.900	11240.480
37	48.526	9810.130
38	50.046	9171.825
39	51.279	7436.269
40	52.417	6869.036
41	53.484	6435.382
42	54.527	6291.008
43	55.405	5300.110
44	56.226	4954.789
45	57.228	6040.763
46	58.119	5375.899
47	58.803	4129.463
48	59.490	4142.190
49	60.168	4093.996
50	60.841	4057.747
51	61.516	4073.006
52	62.192	4080.440
53	62.901	4276.024
54	63.467	3417.302
55	64.038	3446.279
56	64.725	4144.262
57	65.336	3682.622
58	65.795	2773.290
59	66.309	3096.654
60	66.828	3131.361
61	67.333	3048.920
62	67.853	3137.897

63	68.353	3017.666
64	68.793	2650.987
65	69.231	2643.070
66	69.690	2770.804
67	70.116	2570.894
68	70.522	2446.520
69	70.928	2453.838
70	71.334	2446.059
71	71.735	2419.316
72	72.123	2341.294
73	72.492	2228.657
74	72.859	2209.923
75	73.234	2266.264
76	73.608	2254.066
77	73.949	2060.370
78	74.291	2061.935
79	74.632	2056.458
80	74.972	2054.248
81	75.315	2065.617
82	75.645	1990.772
83	75.973	1978.988
84	76.284	1877.629
85	76.571	1735.119
86	76.859	1734.797
87	77.146	1733.231
88	77.428	1699.997
89	77.695	1612.401
90	77.960	1599.835
91	78.224	1590.123
92	78.470	1481.583
93	78.711	1454.931
94	78.954	1464.828
95	79.210	1547.222
96	79.461	1514.541
97	79.698	1430.259
98	79.936	1433.757
99	80.172	1423.124
100	80.397	1361.812
101	80.618	1331.523
102	80.839	1332.168
103	81.060	1334.746
104	81.279	1322.824
105	81.497	1313.664
106	81.713	1304.734
107	81.928	1294.423
108	82.137	1262.662
109	82.333	1183.950
110	82.522	1139.899
111	82.711	1139.346
112	82.901	1142.568
113	83.088	1128.713
114	83.269	1092.855
115	83.450	1092.487
116	83.631	1093.316
117	83.812	1091.429
118	83.987	1057.964
119	84.160	1040.933
120	84.327	1008.390
121	84.493	1004.707
122	84.660	1003.372
123	84.826	1002.682
124	84.993	1005.444
125	85.159	1003.556
126	85.325	1004.707
127	85.492	1006.226
128	85.659	1003.372
129	85.823	993.338
130	85.981	951.082

131	86.119	836.328
132	86.248	777.363
133	86.378	780.263
134	86.507	780.539
135	86.636	775.337
136	86.765	780.493
137	86.893	776.028
138	87.022	776.856
139	87.151	779.572
140	87.280	776.856
141	87.409	778.191
142	87.538	777.685
143	87.667	776.028
144	87.793	763.553
145	87.906	681.619
146	88.015	656.349
147	88.123	648.846
148	88.230	645.025
149	88.338	652.344
150	88.446	651.469

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 5812.1968  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1900.3475  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	500.0	1000.0	1500.0	2000.0
14.000	501.5004	1011.95	.	V	Q	.	.
14.083	508.6326	1035.60	.	V	Q	.	.
14.167	515.9290	1059.43	.	V	.Q	.	.
14.250	523.3969	1084.33	.	.V	.Q	.	.
14.333	531.0382	1109.53	.	.V	.Q	.	.
14.417	538.8441	1133.41	.	.V	.Q	.	.
14.500	546.8092	1156.54	.	.V	.Q	.	.
14.583	554.9529	1182.47	.	.V	.Q	.	.
14.667	563.2805	1209.16	.	.V	.Q	.	.
14.750	571.7853	1234.90	.	.V	.Q	.	.
14.833	580.4671	1260.60	.	.V	.Q	.	.
14.917	589.3345	1287.55	.	.V	.Q	.	.
15.000	598.4079	1317.45	.	.V	.Q	.	.
15.083	607.6765	1345.79	.	.V	.Q	.	.
15.167	617.1382	1373.84	.	.V	.Q	.	.
15.250	626.7845	1400.64	.	.V	.Q	.	.
15.333	636.6090	1426.52	.	.V	.Q	.	.
15.417	646.5952	1449.99	.	.V	.Q	.	.
15.500	656.7221	1470.44	.	.V	.Q	.	.
15.583	667.0005	1492.43	.	.V	.Q	.	.
15.667	677.4247	1513.59	.	.V	.Q	.	.
15.750	687.9932	1534.55	.	.V	.Q	.	.
15.833	698.7257	1558.36	.	.V	.Q	.	.
15.917	709.6141	1580.99	.	.V	.Q	.	.
16.000	720.6578	1603.54	.	.V	.Q	.	.
16.083	731.9606	1641.17	.	.V	.Q	.	.
16.167	743.4771	1672.20	.	.V	.Q	.	.
16.250	755.0926	1686.57	.	.V	.Q	.	.
16.333	766.7864	1697.94	.	.V	.Q	.	.

16.417	778.5690	1710.84	.	.	V	.	.	Q	.
16.500	790.4644	1727.21	.	.	V	.	.	Q	.
16.583	802.5300	1751.92	.	.	V	.	.	Q	.
16.667	814.7026	1767.46	.	.	V	.	.	Q	.
16.750	826.9449	1777.59	.	.	V	.	.	Q	.
16.833	839.2587	1787.96	.	.	V	.	.	Q	.
16.917	851.6570	1800.23	.	.	V	.	.	Q	.
17.000	864.2322	1825.91	.	.	V	.	.	Q	.
17.083	876.9028	1839.77	.	.	V	.	.	Q	.
17.167	889.6234	1847.03	.	.	V	.	.	Q	.
17.250	902.3767	1851.79	.	.	V	.	.	Q	.
17.333	915.1668	1857.12	.	.	V	.	.	Q	.
17.417	928.0707	1873.64	.	.	V	.	.	Q	.
17.500	941.0627	1886.44	.	.	V	.	.	Q	.
17.583	954.1779	1904.32	.	.	V	.	.	Q	.
17.667	967.2741	1901.58	.	.	V	.	.	Q	.
17.750	980.4077	1906.99	.	.	V	.	.	Q	.
17.833	993.7963	1944.03	.	.	V	.	.	Q	.
17.917	1007.2429	1952.45	.	.	V	.	.	Q	.
18.000	1020.5363	1930.20	.	.	V	.	.	Q	.
18.083	1033.7765	1922.47	.	.	V	.	.	Q	.
18.167	1046.9020	1905.81	.	.	V	.	.	Q	.
18.250	1060.0858	1914.29	.	.	V	.	.	Q	.
18.333	1073.2316	1908.76	.	.	V	.	.	Q	.
18.417	1086.2729	1893.62	.	.	V	.	.	Q	.
18.500	1099.2131	1878.91	.	.	V	.	.	Q	.
18.583	1112.1627	1880.27	.	.	V	.	.	Q	.
18.667	1125.1001	1878.51	.	.	V	.	.	Q	.
18.750	1137.9510	1865.96	.	.	V	.	.	Q	.
18.833	1150.7153	1853.37	.	.	V	.	.	Q	.
18.917	1163.4735	1852.48	.	.	V	.	.	Q	.
19.000	1176.2157	1850.17	.	.	V	.	.	Q	.
19.083	1188.7281	1816.81	.	.	V	.	.	Q	.
19.167	1201.0729	1792.45	.	.	V	.	.	Q	.
19.250	1213.1984	1760.62	.	.	V	.	.	Q	.
19.333	1225.1998	1742.62	.	.	V	.	.	Q	.
19.417	1237.0659	1722.95	.	.	V	.	.	Q	.
19.500	1248.8143	1705.87	.	.	V	.	.	Q	.
19.583	1260.3556	1675.79	.	.	V	.	.	Q	.
19.667	1271.7314	1651.78	.	.	V	.	.	Q	.
19.750	1283.0199	1639.09	.	.	V	.	.	Q	.
19.833	1294.0789	1605.76	.	.	V	.	.	Q	.
19.917	1304.8490	1563.83	.	.	V	.	.	Q	.
20.000	1315.4044	1532.65	.	.	V	.	.	Q	.

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 END OF FLOODSCx ROUTING ANALYSIS



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FLOOD ROUTING ANALYSIS  
USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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FILE NAME: LP64002E.FLD  
TIME/DATE OF STUDY: 15:48 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1064.00 IS CODE = 1

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>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 51534.898 ACRES  
BASEFLOW = 0.000 CFS/SQUARE-MILE  
\*USER ENTERED "LAG" TIME = 3.240 HOURS  
VALLEY(DEVELOPED):  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.030  
FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.150  
MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.630  
VALLEY(UNDEVELOPED)/DESERT:  
"S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.190  
DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.590  
LOW LOSS FRACTION = 0.740  
\*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.15  
SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.30  
SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.41  
SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.77  
SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.13  
SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 2.01

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
5-MINUTE FACTOR = 0.337  
30-MINUTE FACTOR = 0.389  
1-HOUR FACTOR = 0.429  
3-HOUR FACTOR = 0.779  
6-HOUR FACTOR = 0.901  
24-HOUR FACTOR = 0.942

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.572

RUNOFF HYDROGRAPH LISTING LIMITS:  
MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.250	1559.691
2	0.751	3119.380
3	1.251	3119.381
4	1.751	3112.347
5	2.244	3075.941
6	2.752	3164.611
7	3.424	4185.866
8	4.166	4627.461
9	4.908	4623.436
10	5.670	4750.567
11	6.452	4873.469
12	7.318	5397.713
13	8.386	6654.329
14	9.341	5951.665
15	10.626	8007.652
16	11.773	7152.688
17	13.118	8383.853
18	14.550	8922.103
19	16.087	9582.771
20	17.873	11129.497
21	19.494	10098.977
22	21.128	10186.219
23	23.222	13052.023
24	25.351	13267.069
25	27.137	11135.096
26	28.941	11238.708
27	30.441	9350.715
28	32.084	10238.750
29	33.766	10483.753
30	35.334	9774.280
31	36.729	8695.390
32	38.231	9357.051
33	39.883	10296.881
34	41.358	9194.048
35	42.882	9498.679
36	44.396	9434.818
37	46.243	11511.788
38	47.857	10058.772
39	49.444	9890.706
40	50.731	8023.267
41	51.873	7118.648
42	52.945	6679.807
43	53.978	6437.253
44	54.944	6023.353
45	55.741	4963.315
46	56.624	5505.103
47	57.603	6103.166
48	58.400	4967.286
49	59.068	4162.237
50	59.740	4185.346
51	60.403	4137.511
52	61.061	4097.568
53	61.722	4121.225
54	62.381	4106.342
55	63.072	4308.977
56	63.626	3448.960
57	64.176	3427.087
58	64.836	4114.282
59	65.464	3912.527
60	65.910	2782.591
61	66.404	3076.214
62	66.911	3160.425

63	67.405	3078.639
64	67.893	3042.786
65	68.415	3252.292
66	68.845	2684.828
67	69.270	2643.412
68	69.698	2668.233
69	70.143	2778.169
70	70.535	2439.326
71	70.928	2451.737
72	71.321	2450.073
73	71.712	2433.145
74	72.098	2408.038
75	72.466	2293.917
76	72.822	2219.311
77	73.175	2197.391
78	73.541	2280.984
79	73.895	2207.614
80	74.224	2050.365
81	74.553	2049.177
82	74.881	2047.275
83	75.208	2034.674
84	75.537	2051.507
85	75.854	1976.995
86	76.169	1961.589
87	76.474	1901.676
88	76.751	1728.070
89	77.028	1725.122
90	77.304	1719.321
91	77.578	1710.857
92	77.839	1622.699
93	78.092	1579.143
94	78.346	1581.568
95	78.589	1518.183
96	78.820	1437.158
97	79.051	1436.635
98	79.286	1470.490
99	79.534	1543.718
100	79.767	1451.233
101	79.994	1415.475
102	80.221	1412.622
103	80.445	1395.361
104	80.659	1332.975
105	80.869	1314.811
106	81.081	1316.047
107	81.292	1315.762
108	81.501	1305.729
109	81.709	1295.791
110	81.916	1288.563
111	82.121	1279.006
112	82.322	1250.428
113	82.512	1183.145
114	82.692	1125.181
115	82.873	1126.274
116	83.053	1124.896
117	83.234	1124.087
118	83.408	1086.855
119	83.581	1076.775
120	83.754	1077.012
121	83.927	1079.010
122	84.097	1062.795
123	84.264	1040.113
124	84.426	1006.258
125	84.585	991.707
126	84.744	991.517
127	84.903	992.230
128	85.062	990.804
129	85.221	990.138
130	85.380	991.565

131	85.539	990.804
132	85.698	993.134
133	85.857	987.618
134	86.015	985.954
135	86.164	930.605
136	86.296	823.475
137	86.420	767.698
138	86.542	763.752
139	86.665	766.272
140	86.788	765.844
141	86.910	761.231
142	87.033	768.935
143	87.156	764.227
144	87.279	764.940
145	87.402	765.083
146	87.524	765.083
147	87.647	764.275
148	87.770	767.888
149	87.892	762.135
150	88.006	708.451

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 6017.6094  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1859.7467  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	500.0	1000.0	1500.0	2000.0
14.000	484.9346	969.02	.	V	Q.	.	.
14.083	491.7618	991.31	.	V	Q.	.	.
14.167	498.7599	1016.12	.	V	Q	.	.
14.250	505.9138	1038.76	.	V	Q	.	.
14.333	513.2302	1062.34	.	.V	.Q	.	.
14.417	520.7108	1086.18	.	.V	.Q	.	.
14.500	528.3503	1109.26	.	.V	.Q	.	.
14.583	536.1510	1132.66	.	.V	.Q	.	.
14.667	544.1219	1157.38	.	.V	.Q	.	.
14.750	552.2701	1183.12	.	.V	.Q	.	.
14.833	560.5869	1207.61	.	.V	.Q	.	.
14.917	569.0757	1232.57	.	.V	.Q	.	.
15.000	577.7399	1258.05	.	.V	.Q	.	.
15.083	586.6086	1287.74	.	.V	.Q	.	.
15.167	595.6607	1314.36	.	.V	.Q	.	.
15.250	604.9149	1343.70	.	.V	.Q	.	.
15.333	614.3448	1369.23	.	.V	.Q	.	.
15.417	623.9328	1392.18	.	.V	.Q	.	.
15.500	633.6591	1412.26	.	.V	.Q	.	.
15.583	643.5297	1433.22	.	.V	.Q	.	.
15.667	653.5597	1456.35	.	.V	.Q	.	.
15.750	663.7258	1476.12	.	.V	.Q	.	.
15.833	674.0299	1496.15	.	.V	.Q	.	.
15.917	684.5041	1520.85	.	.V	.Q	.	.
16.000	695.1577	1546.90	.	.V	.Q	.	.
16.083	706.0607	1583.12	.	.V	.Q	.	.
16.167	717.1912	1616.15	.	.V	.Q	.	.
16.250	728.4125	1629.34	.	.V	.Q	.	.
16.333	739.7184	1641.61	.	.V	.Q	.	.

16.417	751.1147	1654.75	.	.	V	.	.	Q	.
16.500	762.6423	1673.79	.	.	v	.	.	Q	.
16.583	774.3204	1695.67	.	.	v	.	.	Q	.
16.667	786.1164	1712.78	.	.	v	.	.	Q	.
16.750	797.9930	1724.48	.	.	v	.	.	Q	.
16.833	809.9502	1736.19	.	.	v	.	.	Q	.
16.917	822.0004	1749.69	.	.	v	.	.	Q	.
17.000	834.1528	1764.53	.	.	v	.	.	Q	.
17.083	846.4711	1788.63	.	.	v	.	.	Q	.
17.167	858.8111	1791.76	.	.	v	.	.	Q	.
17.250	871.2928	1812.34	.	.	v	.	.	Q	.
17.333	883.7207	1804.53	.	.	v	.	.	Q	.
17.417	896.2773	1823.22	.	.	v	.	.	Q	.
17.500	908.9007	1832.91	.	.	v	.	.	Q	.
17.583	921.6265	1847.78	.	.	v	.	.	Q	.
17.667	934.4549	1862.69	.	.	v	.	.	Q	.
17.750	947.2434	1856.90	.	.	v	.	.	Q	.
17.833	960.1042	1867.39	.	.	v	.	.	Q	.
17.917	973.2092	1902.83	.	.	v	.	.	Q	.
18.000	986.3450	1907.32	.	.	.v	.	.	Q	.
18.083	999.3008	1881.18	.	.	.v	.	.	Q	.
18.167	1012.2252	1876.62	.	.	.v	.	.	Q	.
18.250	1025.0280	1858.95	.	.	.v	.	.	Q	.
18.333	1037.9017	1869.27	.	.	.v	.	.	Q	.
18.417	1050.7220	1861.50	.	.	.v	.	.	Q	.
18.500	1063.4520	1848.40	.	.	.v	.	.	Q	.
18.583	1076.0540	1829.80	.	.	.v	.	.	Q	.
18.667	1088.6440	1828.09	.	.	.v	.	.	Q	.
18.750	1101.2428	1829.35	.	.	.v	.	.	Q	.
18.833	1113.7316	1813.37	.	.	.v	.	.	Q	.
18.917	1126.1620	1804.89	.	.	.v	.	.	Q	.
19.000	1138.5078	1792.61	.	.	.v	.	.	Q	.
19.083	1150.9127	1801.20	.	.	.v	.	.	Q	.
19.167	1163.1167	1772.02	.	.	.v	.	.	Q	.
19.250	1175.1780	1751.30	.	.	.v	.	.	Q	.
19.333	1186.9990	1716.42	.	.	.v	.	.	Q	.
19.417	1198.6832	1696.55	.	.	.v	.	.	Q	.
19.500	1210.2410	1678.18	.	.	.v	.	.	Q	.
19.583	1221.6853	1661.73	.	.	.v	.	.	Q	.
19.667	1232.9677	1638.21	.	.	.v	.	.	Q	.
19.750	1244.0518	1609.42	.	.	.v	.	.	Q	.
19.833	1255.0369	1595.04	.	.	.v	.	.	Q	.
19.917	1265.8718	1573.24	.	.	.v	.	.	Q	.
20.000	1276.4493	1535.86	.	.	.v	.	.	Q	.

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 END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LP65002E.FLD  
 TIME/DATE OF STUDY: 15:49 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1065.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 53246.801 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 3.380 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.050  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.150  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.610  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.190  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.580  
 LOW LOSS FRACTION = 0.740  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.15  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.30  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.41  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.76  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.12  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 1.99

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.332  
 30-MINUTE FACTOR = 0.384  
 1-HOUR FACTOR = 0.424  
 3-HOUR FACTOR = 0.774  
 6-HOUR FACTOR = 0.899  
 24-HOUR FACTOR = 0.941

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.465

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.237	1527.615
2	0.712	3055.232
3	1.186	3055.230
4	1.660	3051.943
5	2.128	3013.689
6	2.604	3064.169
7	3.185	3739.959
8	3.890	4541.952
9	4.591	4516.350
10	5.304	4590.620
11	6.040	4735.792
12	6.795	4863.093
13	7.743	6104.873
14	8.718	6282.289
15	9.729	6504.356
16	10.937	7783.455
17	12.063	7250.029
18	13.393	8561.302
19	14.768	8856.369
20	16.285	9772.596
21	17.983	10932.856
22	19.509	9824.035
23	21.098	10235.472
24	23.100	12888.012
25	25.121	13016.277
26	26.830	11007.828
27	28.573	11221.052
28	30.012	9266.216
29	31.578	10086.191
30	33.166	10226.887
31	34.764	10286.689
32	36.093	8559.656
33	37.495	9025.406
34	39.106	10375.147
35	40.555	9332.369
36	42.050	9628.843
37	43.457	9060.337
38	45.119	10700.633
39	46.869	11268.940
40	48.404	9883.851
41	49.886	9547.237
42	51.079	7679.718
43	52.174	7052.109
44	53.204	6634.899
45	54.217	6523.670
46	55.153	6026.010
47	55.944	5089.130
48	56.834	5732.116
49	57.795	6188.286
50	58.587	5099.595
51	59.253	4292.344
52	59.923	4314.083
53	60.578	4214.768
54	61.231	4207.792
55	61.885	4209.093
56	62.529	4151.686
57	63.209	4373.555
58	63.795	3774.664
59	64.319	3378.555
60	64.915	3834.725
61	65.584	4305.683
62	66.089	3255.485

63	66.543	2920.469
64	67.036	3176.927
65	67.530	3178.793
66	68.006	3070.855
67	68.492	3129.516
68	68.981	3144.599
69	69.394	2660.622
70	69.805	2644.016
71	70.221	2680.716
72	70.649	2759.717
73	71.027	2430.007
74	71.407	2450.346
75	71.787	2446.662
76	72.164	2428.140
77	72.537	2403.427
78	72.898	2321.921
79	73.243	2222.188
80	73.582	2183.474
81	73.924	2197.820
82	74.281	2304.333
83	74.598	2036.379
84	74.913	2030.385
85	75.228	2031.270
86	75.541	2011.863
87	75.853	2009.063
88	76.163	1997.665
89	76.462	1927.802
90	76.762	1928.589
91	77.044	1815.246
92	77.307	1697.580
93	77.572	1701.756
94	77.835	1695.615
95	78.096	1682.006
96	78.343	1589.053
97	78.582	1541.937
98	78.821	1536.189
99	79.052	1489.565
100	79.270	1401.426
101	79.487	1399.412
102	79.708	1420.882
103	79.941	1499.833
104	80.165	1447.461
105	80.379	1378.090
106	80.593	1376.223
107	80.806	1373.570
108	81.012	1324.342
109	81.212	1284.399
110	81.411	1281.697
111	81.610	1281.451
112	81.809	1283.073
113	82.006	1266.270
114	82.201	1261.799
115	82.396	1252.121
116	82.589	1243.179
117	82.777	1210.115
118	82.953	1137.255
119	83.124	1098.492
120	83.295	1098.345
121	83.465	1098.050
122	83.635	1095.397
123	83.800	1062.185
124	83.963	1048.871
125	84.126	1052.163
126	84.290	1052.703
127	84.452	1044.007
128	84.609	1008.192
129	84.763	996.499
130	84.914	966.923

131	85.064	969.477
132	85.214	963.631
133	85.364	968.691
134	85.514	965.351
135	85.664	967.709
136	85.814	963.680
137	85.964	966.333
138	86.115	970.067
139	86.264	962.305
140	86.411	947.173
141	86.549	889.150
142	86.671	782.047
143	86.786	740.631
144	86.900	736.553
145	87.016	743.874
146	87.130	738.911
147	87.246	742.940
148	87.361	740.582
149	87.476	738.911
150	87.591	740.631

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 6146.9204  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1890.7423  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS) 0.	500.0	1000.0	1500.0	2000.0
14.000	487.1143	968.26	.	V	Q.	.
14.083	493.9516	992.79	.	V	Q.	.
14.167	500.9566	1017.12	.	V	Q	.
14.250	508.1307	1041.69	.	V	Q	.
14.333	515.4578	1063.90	.	V	.Q	.
14.417	522.9442	1087.01	.	.V	.Q	.
14.500	530.5911	1110.34	.	.V	.Q	.
14.583	538.4058	1134.68	.	.V	.Q	.
14.667	546.3812	1158.04	.	.V	.Q	.
14.750	554.5205	1181.82	.	.V	.Q	.
14.833	562.8347	1207.21	.	.V	.Q	.
14.917	571.3158	1231.46	.	.V	.Q	.
15.000	579.9667	1256.12	.	.V	.Q	.
15.083	588.7940	1281.72	.	.V	.Q	.
15.167	597.8113	1309.31	.	.V	.Q	.
15.250	607.0239	1337.66	.	.V	.Q	.
15.333	616.4308	1365.90	.	.V	.Q	.
15.417	626.0024	1389.78	.	.V	.Q	.
15.500	635.7148	1410.25	.	.V	.Q	.
15.583	645.5679	1430.66	.	.V	.Q	.
15.667	655.5687	1452.11	.	.V	.Q	.
15.750	665.7249	1474.68	.	.V	.Q	.
15.833	676.0182	1494.61	.	.V	.Q	.
15.917	686.4478	1514.37	.	.V	.Q	.
16.000	697.0555	1540.23	.	.V	.Q	.
16.083	707.9421	1580.74	.	.V	.Q	.
16.167	719.0569	1613.87	.	.V	.Q	.
16.250	730.2845	1630.24	.	.V	.Q	.
16.333	741.5945	1642.20	.	.V	.Q	.

16.417	752.9946	1655.30	.	.	V	.	.	Q	.
16.500	764.5187	1673.30	.	.	v	.	.	Q	.
16.583	776.2064	1697.05	.	.	v	.	.	Q	.
16.667	788.0234	1715.83	.	.	v	.	.	Q	.
16.750	799.9264	1728.31	.	.	v	.	.	Q	.
16.833	811.9154	1740.81	.	.	v	.	.	Q	.
16.917	823.9919	1753.51	.	.	v	.	.	Q	.
17.000	836.1692	1768.13	.	.	v	.	.	Q	.
17.083	848.4830	1787.97	.	.	v	.	.	Q	.
17.167	860.8759	1799.45	.	.	v	.	.	Q	.
17.250	873.3536	1811.77	.	.	v	.	.	Q	.
17.333	885.9246	1825.30	.	.	v	.	.	Q	.
17.417	898.4953	1825.28	.	.	v	.	.	Q	.
17.500	911.1982	1844.46	.	.	v	.	.	Q	.
17.583	923.9602	1853.04	.	.	v	.	.	Q	.
17.667	936.8357	1869.52	.	.	v	.	.	Q	.
17.750	949.7959	1881.83	.	.	v	.	.	Q	.
17.833	962.7310	1878.18	.	.	v	.	.	Q	.
17.917	975.7458	1889.75	.	.	v	.	.	Q	.
18.000	988.9890	1922.91	.	.	v	.	.	Q	.
18.083	1002.2549	1926.22	.	.	.v	.	.	Q	.
18.167	1015.3513	1901.58	.	.	.v	.	.	Q	.
18.250	1028.4155	1896.93	.	.	.v	.	.	Q	.
18.333	1041.3575	1879.18	.	.	.v	.	.	Q	.
18.417	1054.3718	1889.67	.	.	.v	.	.	Q	.
18.500	1067.3414	1883.19	.	.	.v	.	.	Q	.
18.583	1080.2432	1873.34	.	.	.v	.	.	Q	.
18.667	1092.9670	1847.51	.	.	.v	.	.	Q	.
18.750	1105.6649	1843.74	.	.	.v	.	.	Q	.
18.833	1118.3990	1848.99	.	.	.v	.	.	Q	.
18.917	1131.0187	1832.38	.	.	.v	.	.	Q	.
19.000	1143.5741	1823.05	.	.	.v	.	.	Q	.
19.083	1156.0203	1807.18	.	.	.v	.	.	Q	.
19.167	1168.5109	1813.64	.	.	.v	.	.	Q	.
19.250	1180.9399	1804.71	.	.	.v	.	.	Q	.
19.333	1193.1782	1777.00	.	.	.v	.	.	Q	.
19.417	1205.2551	1753.56	.	.	.v	.	.	Q	.
19.500	1217.1036	1720.40	.	.	.v	.	.	Q	.
19.583	1228.8302	1702.70	.	.	.v	.	.	Q	.
19.667	1240.4408	1685.86	.	.	.v	.	.	Q	.
19.750	1251.9290	1668.09	.	.	.v	.	.	Q	.
19.833	1263.2484	1643.58	.	.	.v	.	.	Q	.
19.917	1274.3870	1617.31	.	.	.v	.	.	Q	.
20.000	1285.4075	1600.18	.	.	.v	.	.	Q	.

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 END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LP66002E.FLD  
 TIME/DATE OF STUDY: 15:49 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1066.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 61499.898 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 3.590 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.080  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.140  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.620  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.160  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.570  
 LOW LOSS FRACTION = 0.770  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.15  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.30  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.40  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.74  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.09  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 1.92

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.307  
 30-MINUTE FACTOR = 0.362  
 1-HOUR FACTOR = 0.407  
 3-HOUR FACTOR = 0.753  
 6-HOUR FACTOR = 0.891  
 24-HOUR FACTOR = 0.936

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.321

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.223	1655.578
2	0.668	3311.155
3	1.113	3311.156
4	1.558	3310.706
5	1.998	3274.564
6	2.440	3283.428
7	2.921	3581.560
8	3.565	4787.607
9	4.224	4897.335
10	4.885	4921.604
11	5.564	5050.716
12	6.255	5140.745
13	6.987	5442.343
14	7.928	6999.642
15	8.821	6640.515
16	9.820	7425.791
17	10.954	8440.400
18	12.022	7938.877
19	13.289	9426.553
20	14.594	9702.616
21	15.986	10352.812
22	17.594	11963.886
23	19.084	11081.137
24	20.512	10620.653
25	22.296	13269.341
26	24.212	14251.918
27	26.026	13490.574
28	27.589	11626.425
29	29.155	11641.576
30	30.538	10287.633
31	32.013	10975.393
32	33.515	11166.026
33	34.978	10886.219
34	36.222	9250.184
35	37.539	9792.890
36	39.051	11249.187
37	40.431	10263.956
38	41.787	10086.146
39	43.140	10061.576
40	44.591	10790.944
41	46.260	12413.390
42	47.715	10818.806
43	49.197	11024.619
44	50.452	9338.563
45	51.520	7941.650
46	52.536	7555.871
47	53.491	7099.218
48	54.455	7171.596
49	55.333	6532.026
50	56.095	5667.464
51	56.973	6529.615
52	57.894	6848.265
53	58.665	5737.203
54	59.310	4800.348
55	59.971	4909.524
56	60.604	4709.188
57	61.242	4746.866
58	61.874	4701.527
59	62.502	4669.892
60	63.119	4586.023
61	63.751	4707.258
62	64.269	3851.661

63	64.789	3866.415
64	65.394	4501.445
65	66.014	4609.771
66	66.470	3389.078
67	66.922	3359.911
68	67.398	3542.629
69	67.871	3522.599
70	68.326	3384.368
71	68.781	3378.240
72	69.253	3512.214
73	69.648	2936.993
74	70.038	2904.932
75	70.429	2903.684
76	70.840	3055.760
77	71.211	2763.922
78	71.572	2679.486
79	71.933	2685.728
80	72.292	2671.768
81	72.648	2646.857
82	73.001	2623.989
83	73.337	2504.939
84	73.663	2422.092
85	73.980	2356.948
86	74.298	2367.276
87	74.634	2497.335
88	74.932	2214.519
89	75.228	2202.603
90	75.524	2203.000
91	75.818	2187.963
92	76.107	2145.574
93	76.398	2164.130
94	76.680	2097.058
95	76.959	2081.737
96	77.237	2063.295
97	77.488	1866.617
98	77.734	1830.585
99	77.978	1816.512
100	78.223	1817.306
101	78.464	1795.516
102	78.693	1701.377
103	78.912	1633.624
104	79.132	1631.921
105	79.346	1592.143
106	79.546	1490.627
107	79.746	1485.123
108	79.946	1490.003
109	80.156	1557.302
110	80.366	1567.176
111	80.565	1479.221
112	80.762	1461.574
113	80.958	1462.482
114	81.153	1448.182
115	81.339	1382.585
116	81.522	1361.419
117	81.705	1362.157
118	81.888	1359.717
119	82.071	1359.547
120	82.252	1348.708
121	82.432	1338.665
122	82.612	1337.076
123	82.790	1324.819
124	82.964	1297.241
125	83.131	1236.581
126	83.288	1170.190
127	83.445	1166.898
128	83.602	1169.679
129	83.759	1163.494
130	83.914	1154.301

131	84.065	1126.269
132	84.216	1120.254
133	84.367	1128.085
134	84.518	1119.630
135	84.667	1111.572
136	84.813	1086.151
137	84.956	1060.843
138	85.095	1033.605
139	85.234	1032.697
140	85.373	1032.640
141	85.512	1033.775
142	85.651	1032.697
143	85.789	1032.697
144	85.928	1029.860
145	86.067	1037.407
146	86.206	1027.987
147	86.345	1037.407
148	86.482	1017.716
149	86.614	982.705
150	86.737	914.441

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 7093.1743  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1836.7836  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	475.0	950.0	1425.0	1900.0
14.000	462.7811	924.31	.	V	Q.	.	.
14.083	469.3048	947.24	.	V	Q.	.	.
14.167	476.0069	973.14	.	V	Q	.	.
14.250	482.8813	998.16	.	V	.Q	.	.
14.333	489.9133	1021.05	.	V	.Q	.	.
14.417	497.1026	1043.90	.	V	.Q	.	.
14.500	504.4387	1065.19	.	V	.Q	.	.
14.583	511.9288	1087.57	.	.V	.Q	.	.
14.667	519.5834	1111.45	.	.V	.Q	.	.
14.750	527.4007	1135.06	.	.V	.Q	.	.
14.833	535.3672	1156.75	.	.V	.Q	.	.
14.917	543.4877	1179.10	.	.V	.Q	.	.
15.000	551.7729	1203.01	.	.V	.Q	.	.
15.083	560.2169	1226.06	.	.V	.Q	.	.
15.167	568.8289	1250.46	.	.V	.Q	.	.
15.250	577.6048	1274.26	.	.V	.Q	.	.
15.333	586.5541	1299.44	.	.V	.Q	.	.
15.417	595.6772	1324.66	.	.V	.Q	.	.
15.500	604.9378	1344.64	.	.V	.Q	.	.
15.583	614.3511	1366.81	.	.V	.Q	.	.
15.667	623.9077	1387.62	.	.V	.Q	.	.
15.750	633.6006	1407.41	.	.V	.Q	.	.
15.833	643.4380	1428.39	.	.V	.Q	.	.
15.917	653.4163	1448.85	.	.V	.Q	.	.
16.000	663.5375	1469.59	.	.V	.Q	.	.
16.083	673.9001	1504.66	.	.V	.Q	.	.
16.167	684.4865	1537.13	.	.V	.Q	.	.
16.250	695.1996	1555.55	.	.V	.Q	.	.
16.333	706.0154	1570.47	.	.V	.Q	.	.



16.417	716.9354	1585.58	.	.	V	.	.	Q	.
16.500	727.9518	1599.58	.	.	V	.	.	Q	.
16.583	739.0979	1618.41	.	.	V	.	.	Q	.
16.667	750.4047	1641.75	.	.	V	.	.	Q	.
16.750	761.7980	1654.31	.	.	V	.	.	Q	.
16.833	773.2639	1664.85	.	.	V	.	.	Q	.
16.917	784.8004	1675.09	.	.	V	.	.	Q	.
17.000	796.4349	1689.33	.	.	V	.	.	Q	.
17.083	808.1606	1702.57	.	.	V	.	.	Q	.
17.167	819.9963	1718.54	.	.	V	.	.	Q	.
17.250	831.8611	1722.78	.	.	V	.	.	Q	.
17.333	843.8299	1737.87	.	.	V	.	.	Q	.
17.417	855.8921	1751.43	.	.	V	.	.	Q	.
17.500	867.9634	1752.76	.	.	V	.	.	Q	.
17.583	880.1504	1769.55	.	.	V	.	.	Q	.
17.667	892.4065	1779.59	.	.	V	.	.	Q	.
17.750	904.7433	1791.30	.	.	V	.	.	Q	.
17.833	917.1907	1807.37	.	.	V	.	.	Q	.
17.917	929.6347	1806.87	.	.	V	.	.	Q	.
18.000	942.1247	1813.55	.	.	V	.	.	Q	.
18.083	954.7867	1838.53	.	.	V	.	.	Q	.
18.167	967.5125	1847.77	.	.	V	.	.	Q	.
18.250	980.1885	1840.56	.	.	V	.	.	Q	.
18.333	992.7336	1821.56	.	.	V	.	.	Q	.
18.417	1005.2645	1819.48	.	.	V	.	.	Q	.
18.500	1017.7437	1811.97	.	.	V	.	.	Q	.
18.583	1030.2573	1816.99	.	.	V	.	.	Q	.
18.667	1042.7261	1810.46	.	.	V	.	.	Q	.
18.750	1055.0991	1796.57	.	.	V	.	.	Q	.
18.833	1067.3202	1774.49	.	.	V	.	.	Q	.
18.917	1079.5160	1770.82	.	.	V	.	.	Q	.
19.000	1091.7374	1774.56	.	.	V	.	.	Q	.
19.083	1103.8496	1758.69	.	.	V	.	.	Q	.
19.167	1115.8584	1743.67	.	.	V	.	.	Q	.
19.250	1127.7957	1733.29	.	.	V	.	.	Q	.
19.333	1139.7227	1731.79	.	.	V	.	.	Q	.
19.417	1151.6482	1731.59	.	.	V	.	.	Q	.
19.500	1163.4119	1708.08	.	.	V	.	.	Q	.
19.583	1175.0557	1690.67	.	.	V	.	.	Q	.
19.667	1186.4794	1658.72	.	.	V	.	.	Q	.
19.750	1197.7384	1634.81	.	.	V	.	.	Q	.
19.833	1208.8859	1618.61	.	.	V	.	.	Q	.
19.917	1219.9249	1602.87	.	.	V	.	.	Q	.
20.000	1230.8550	1587.04	.	.	V	.	.	Q	.

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 END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LP67002E.FLD  
 TIME/DATE OF STUDY: 15:50 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1067.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 66684.602 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 3.770 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.080  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.140  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.620  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.160  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.570  
 LOW LOSS FRACTION = 0.770  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.15  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.29  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.40  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.73  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.07  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 1.88

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.293  
 30-MINUTE FACTOR = 0.352  
 1-HOUR FACTOR = 0.396  
 3-HOUR FACTOR = 0.740  
 6-HOUR FACTOR = 0.887  
 24-HOUR FACTOR = 0.933

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.210

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.212	1709.440
2	0.636	3418.879
3	1.060	3418.881
4	1.484	3418.876
5	1.904	3392.417
6	2.323	3373.146
7	2.755	3482.873
8	3.328	4623.061
9	3.956	5067.567
10	4.584	5065.306
11	5.221	5133.542
12	5.875	5277.265
13	6.536	5329.341
14	7.302	6175.700
15	8.228	7467.008
16	9.025	6432.278
17	10.088	8573.379
18	11.118	8301.292
19	12.162	8422.903
20	13.378	9807.003
21	14.622	10029.222
22	15.944	10660.843
23	17.478	12372.959
24	18.909	11540.186
25	20.256	10864.556
26	21.879	13092.628
27	23.704	14712.920
28	25.502	14504.308
29	26.996	12042.735
30	28.585	12816.949
31	29.875	10402.016
32	31.270	11250.078
33	32.677	11347.493
34	34.146	11851.197
35	35.397	10083.790
36	36.624	9900.681
37	37.907	10346.763
38	39.364	11750.229
39	40.635	10251.271
40	41.953	10626.410
41	43.227	10276.374
42	44.620	11232.189
43	46.214	12858.604
44	47.604	11209.208
45	49.017	11394.747
46	50.259	10014.017
47	51.290	8313.891
48	52.269	7891.774
49	53.194	7461.689
50	54.109	7378.841
51	54.981	7038.158
52	55.751	6205.461
53	56.510	6123.936
54	57.385	7057.047
55	58.234	6846.711
56	58.888	5273.796
57	59.513	5036.173
58	60.132	4993.441
59	60.736	4869.430
60	61.343	4896.011
61	61.945	4854.817
62	62.541	4811.778

63	63.128	4734.560
64	63.734	4886.320
65	64.229	3988.188
66	64.720	3958.685
67	65.283	4541.729
68	65.886	4866.292
69	66.357	3793.296
70	66.773	3359.643
71	67.223	3628.092
72	67.678	3665.870
73	68.118	3549.151
74	68.548	3470.148
75	68.998	3628.892
76	69.411	3328.325
77	69.784	3008.069
78	70.156	2998.655
79	70.529	3012.130
80	70.922	3169.335
81	71.267	2781.828
82	71.611	2773.891
83	71.955	2774.445
84	72.297	2756.109
85	72.636	2732.667
86	72.972	2712.609
87	73.295	2605.180
88	73.606	2508.149
89	73.909	2442.560
90	74.209	2423.178
91	74.530	2589.798
92	74.822	2353.774
93	75.105	2277.356
94	75.387	2274.833
95	75.669	2275.141
96	75.945	2224.134
97	76.221	2231.702
98	76.496	2214.658
99	76.763	2152.699
100	77.030	2150.300
101	77.290	2103.107
102	77.526	1896.679
103	77.760	1890.834
104	77.992	1874.221
105	78.225	1878.651
106	78.456	1856.808
107	78.674	1761.624
108	78.883	1689.205
109	79.092	1685.821
110	79.299	1665.085
111	79.491	1549.965
112	79.682	1535.752
113	79.871	1531.261
114	80.067	1574.638
115	80.270	1636.721
116	80.463	1558.826
117	80.650	1511.633
118	80.838	1514.402
119	81.025	1508.003
120	81.208	1476.931
121	81.384	1414.357
122	81.558	1405.558
123	81.732	1406.112
124	81.907	1405.250
125	82.081	1402.912
126	82.253	1390.976
127	82.425	1385.254
128	82.595	1376.763
129	82.766	1374.117
130	82.932	1342.184

131	83.093	1300.036
132	83.244	1213.466
133	83.393	1202.883
134	83.542	1202.944
135	83.692	1206.636
136	83.841	1200.114
137	83.986	1171.565
138	84.130	1159.936
139	84.274	1160.121
140	84.417	1153.476
141	84.562	1169.350
142	84.702	1127.880
143	84.840	1119.389
144	84.975	1088.317
145	85.108	1067.520
146	85.239	1061.736
147	85.372	1071.889
148	85.504	1066.351
149	85.636	1061.860
150	85.768	1063.090

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 7508.0059  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1922.4806  
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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

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

TIME(HRS)	VOLUME(AF)	Q(CFS) 0.	500.0	1000.0	1500.0	2000.0
14.000	477.0123	952.03	.	V.	Q.	.
14.083	483.7090	972.37	.	V	Q.	.
14.167	490.5758	997.06	.	V	Q.	.
14.250	497.6245	1023.48	.	V	Q	.
14.333	504.8535	1049.64	.	V	Q	.
14.417	512.2430	1072.95	.	V	.Q	.
14.500	519.7987	1097.09	.	V	.Q	.
14.583	527.5024	1118.57	.	V	. Q	.
14.667	535.3687	1142.18	.	.V	. Q	.
14.750	543.4007	1166.25	.	.V	. Q	.
14.833	551.6017	1190.79	.	.V	. Q	.
14.917	559.9578	1213.29	.	.V	. Q	.
15.000	568.4677	1235.63	.	.V	. Q	.
15.083	577.1342	1258.38	.	. V	. Q	.
15.167	585.9734	1283.45	.	. V	. Q	.
15.250	594.9816	1307.99	.	. V	. Q	.
15.333	604.1526	1331.64	.	. V	. Q	.
15.417	613.4808	1354.45	.	. V	. Q	.
15.500	622.9542	1375.53	.	. V	. Q	.
15.583	632.5873	1398.73	.	. V	. Q	.
15.667	642.3797	1421.85	.	. V	. Q	.
15.750	652.3293	1444.69	.	. V	. Q	.
15.833	662.4271	1466.20	.	. V	. Q	.
15.917	672.6806	1488.80	.	. V	. Q	.
16.000	683.0881	1511.17	.	. V	. Q	.
16.083	693.7197	1543.72	.	. V	. Q	.
16.167	704.5743	1576.08	.	. V	. Q	.
16.250	715.5673	1596.19	.	. V	. Q	.
16.333	726.6805	1613.64	.	. V	. Q	.

16.417	737.9032	1629.53	.	.	V	.	.	Q	.
16.500	749.2626	1649.38	.	.	V	.	.	Q	.
16.583	760.7421	1666.83	.	.	V	.	.	Q	.
16.667	772.3936	1691.79	.	.	V	.	.	Q	.
16.750	784.1547	1707.71	.	.	V	.	.	Q	.
16.833	796.0066	1720.90	.	.	V	.	.	Q	.
16.917	807.9362	1732.18	.	.	V	.	.	Q	.
17.000	819.9507	1744.51	.	.	V	.	.	Q	.
17.083	832.0441	1755.96	.	.	V	.	.	Q	.
17.167	844.2487	1772.10	.	.	V	.	.	Q	.
17.250	856.5518	1786.41	.	.	V	.	.	Q	.
17.333	868.8635	1787.66	.	.	V	.	.	Q	.
17.417	881.3282	1809.89	.	.	V	.	.	Q	.
17.500	893.8166	1813.31	.	.	V	.	.	Q	.
17.583	906.3682	1822.50	.	.	V	.	.	Q	.
17.667	919.0187	1836.86	.	.	V	.	.	Q	.
17.750	931.7559	1849.43	.	.	V	.	.	Q	.
17.833	944.5703	1860.65	.	.	V	.	.	Q	.
17.917	957.5011	1877.56	.	.	V	.	.	Q	.
18.000	970.4301	1877.28	.	.	V	.	.	Q	.
18.083	983.3830	1880.77	.	.	V	.	.	Q	.
18.167	996.4714	1900.45	.	.	V	.	.	Q	.
18.250	1009.6655	1915.78	.	.	.V	.	.	Q	.
18.333	1022.8476	1914.04	.	.	.V	.	.	Q	.
18.417	1035.8809	1892.44	.	.	.V	.	.	Q	.
18.500	1048.9254	1894.08	.	.	.V	.	.	Q	.
18.583	1061.8772	1880.59	.	.	.V	.	.	Q	.
18.667	1074.8743	1887.17	.	.	.V	.	.	Q	.
18.750	1087.8384	1882.40	.	.	.V	.	.	Q	.
18.833	1100.7665	1877.16	.	.	.V	.	.	Q	.
18.917	1113.5094	1850.28	.	.	.V	.	.	Q	.
19.000	1126.1882	1840.97	.	.	.V	.	.	Q	.
19.083	1138.8372	1836.62	.	.	.V	.	.	Q	.
19.167	1151.4794	1835.65	.	.	.V	.	.	Q	.
19.250	1163.9489	1810.58	.	.	.V	.	.	Q	.
19.333	1176.3556	1801.46	.	.	.V	.	.	Q	.
19.417	1188.6702	1788.09	.	.	.V	.	.	Q	.
19.500	1200.9667	1785.45	.	.	.V	.	.	Q	.
19.583	1213.2660	1785.87	.	.	.V	.	.	Q	.
19.667	1225.3979	1761.55	.	.	.V	.	.	Q	.
19.750	1237.4218	1745.85	.	.	.V	.	.	Q	.
19.833	1249.2362	1715.46	.	.	.V	.	.	Q	.
19.917	1260.8577	1687.44	.	.	.V	.	.	Q	.
20.000	1272.3663	1671.05	.	.	.V	.	.	Q	.

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 END OF FLOODSCx ROUTING ANALYSIS

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FLOOD ROUTING ANALYSIS  
 USING COUNTY HYDROLOGY MANUAL OF ORANGE(1986)  
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 Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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 714 - 734 - 5100

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 FILE NAME: LP68002E.FLD  
 TIME/DATE OF STUDY: 15:50 02/25/2004

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FLOW PROCESS FROM NODE 1000.00 TO NODE 1068.00 IS CODE = 1

>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<

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(UNIT-HYDROGRAPH ADDED TO STREAM #1)

WATERSHED AREA = 68244.898 ACRES  
 BASEFLOW = 0.000 CFS/SQUARE-MILE  
 \*USER ENTERED "LAG" TIME = 3.950 HOURS  
 VALLEY(DEVELOPED):  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.090  
 FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.140  
 MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.610  
 VALLEY(UNDEVELOPED)/DESERT:  
 "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.160  
 DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) = 0.000  
 MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) = 0.560  
 LOW LOSS FRACTION = 0.770  
 \*HYDROGRAPH MODEL #1 SPECIFIED\*

SPECIFIED PEAK 5-MINUTES RAINFALL(INCH)= 0.15  
 SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)= 0.29  
 SPECIFIED PEAK 1-HOUR RAINFALL(INCH) = 0.40  
 SPECIFIED PEAK 3-HOUR RAINFALL(INCH) = 0.73  
 SPECIFIED PEAK 6-HOUR RAINFALL(INCH) = 1.06  
 SPECIFIED PEAK 24-HOUR RAINFALL(INCH) = 1.87

PRECIPITATION DEPTH-AREA REDUCTION FACTORS:  
 5-MINUTE FACTOR = 0.289  
 30-MINUTE FACTOR = 0.350  
 1-HOUR FACTOR = 0.393  
 3-HOUR FACTOR = 0.736  
 6-HOUR FACTOR = 0.885  
 24-HOUR FACTOR = 0.932

UNIT HYDROGRAPH TIME UNIT = 5.000 MINUTES  
 UNIT INTERVAL PERCENTAGE OF LAG-TIME = 2.110

RUNOFF HYDROGRAPH LISTING LIMITS:  
 MODEL TIME(HOURS) FOR BEGINNING OF RESULTS = 14.00  
 MODEL TIME(HOURS) FOR END OF RESULTS = 20.00

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UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.201	1660.319
2	0.604	3320.638
3	1.006	3320.639
4	1.408	3320.641
5	1.809	3304.740
6	2.205	3268.240
7	2.608	3332.517
8	3.094	4005.250
9	3.691	4932.377
10	4.286	4910.317
11	4.885	4940.186
12	5.499	5065.547
13	6.123	5151.896
14	6.760	5259.371
15	7.572	6701.626
16	8.438	7146.386
17	9.191	6214.363
18	10.270	8907.858
19	11.213	7782.396
20	12.239	8466.412
21	13.401	9593.983
22	14.586	9779.031
23	15.840	10349.712
24	17.299	12037.952
25	18.671	11329.080
26	19.963	10659.319
27	21.422	12040.243
28	23.152	14279.439
29	24.886	14314.717
30	26.401	12503.830
31	27.864	12068.830
32	29.213	11135.374
33	30.491	10548.290
34	31.830	11052.540
35	33.184	11173.863
36	34.573	11463.202
37	35.693	9246.438
38	36.885	9838.434
39	38.175	10649.748
40	39.560	11426.177
41	40.749	9816.237
42	42.028	10556.303
43	43.245	10046.040
44	44.597	11152.832
45	46.134	12690.925
46	47.479	11099.058
47	48.836	11196.217
48	50.076	10240.045
49	51.087	8339.979
50	52.039	7854.621
51	52.948	7507.005
52	53.818	7178.532
53	54.698	7259.225
54	55.493	6563.616
55	56.195	5798.174
56	57.008	6707.341
57	57.858	7012.862
58	58.611	6214.300
59	59.210	4945.018
60	59.825	5077.377
61	60.417	4883.813
62	61.003	4834.855

63	61.590	4847.764
64	62.174	4818.452
65	62.749	4749.628
66	63.315	4671.358
67	63.902	4840.963
68	64.380	3948.736
69	64.851	3885.641
70	65.382	4378.997
71	65.965	4813.037
72	66.465	4125.928
73	66.855	3222.901
74	67.284	3535.727
75	67.722	3620.419
76	68.155	3570.989
77	68.570	3427.863
78	68.983	3411.113
79	69.425	3647.999
80	69.791	3016.554
81	70.148	2944.393
82	70.504	2944.645
83	70.867	2989.289
84	71.238	3067.622
85	71.565	2694.157
86	71.895	2721.800
87	72.224	2720.793
88	72.551	2700.643
89	72.876	2678.793
90	73.198	2656.628
91	73.510	2575.399
92	73.809	2465.583
93	74.100	2402.111
94	74.387	2369.367
95	74.687	2473.580
96	74.979	2410.737
97	75.248	2226.052
98	75.517	2221.581
99	75.787	2221.644
100	76.054	2207.224
101	76.315	2153.638
102	76.579	2178.951
103	76.837	2129.647
104	77.090	2089.096
105	77.343	2090.103
106	77.587	2012.715
107	77.809	1833.382
108	78.033	1842.386
109	78.254	1827.652
110	78.476	1828.470
111	78.695	1812.351
112	78.904	1720.354
113	79.102	1638.370
114	79.300	1633.080
115	79.497	1627.602
116	79.681	1519.926
117	79.861	1485.672
118	80.042	1486.238
119	80.222	1493.417
120	80.414	1577.668
121	80.603	1564.508
122	80.781	1471.000
123	80.959	1466.151
124	81.137	1466.214
125	81.313	1453.621
126	81.484	1413.573
127	81.649	1362.128
128	81.814	1362.128
129	81.979	1362.317
130	82.144	1362.128

131	82.309	1357.783
132	82.472	1345.064
133	82.634	1341.915
134	82.796	1335.807
135	82.958	1333.289
136	83.115	1299.601
137	83.270	1280.521
138	83.414	1183.424
139	83.556	1171.020
140	83.696	1161.700
141	83.838	1170.957
142	83.979	1165.289
143	84.119	1152.696
144	84.256	1125.871
145	84.392	1122.345
146	84.527	1120.015
147	84.663	1124.675
148	84.800	1124.612
149	84.932	1088.279
150	85.062	1079.338

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TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 7634.8193  
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1938.8712  
-----

=====

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.	500.0	1000.0	1500.0	2000.0
14.000	475.8686	936.98	.	V.	Q .	.
14.083	482.4615	957.30	.	V.	Q .	.
14.167	489.2023	978.76	.	V	Q.	.
14.250	496.1007	1001.65	.	V	Q	.
14.333	503.1732	1026.93	.	V	Q	.
14.417	510.4195	1052.15	.	V	.Q	.
14.500	517.8257	1075.39	.	V	.Q	.
14.583	525.3887	1098.14	.	V	.Q	.
14.667	533.1064	1120.62	.	V	.Q	.
14.750	540.9809	1143.37	.	.V	.Q	.
14.833	549.0151	1166.57	.	.V	.Q	.
14.917	557.2092	1189.78	.	.V	.Q	.
15.000	565.5657	1213.36	.	.V	.Q	.
15.083	574.0677	1234.49	.	.V	.Q	.
15.167	582.7198	1256.29	.	.V	.Q	.
15.250	591.5374	1280.30	.	.V	.Q	.
15.333	600.5281	1305.47	.	.V	.Q	.
15.417	609.6551	1325.23	.	.V	.Q	.
15.500	618.9272	1346.31	.	.V	.Q	.
15.583	628.3336	1365.82	.	.V	.Q	.
15.667	637.8896	1387.54	.	.V	.Q	.
15.750	647.6112	1411.57	.	.V	.Q	.
15.833	657.4852	1433.70	.	.V	.Q	.
15.917	667.5255	1457.85	.	.V	.Q	.
16.000	677.7488	1484.42	.	.V	.Q	.
16.083	688.2055	1518.31	.	.V	.Q	.
16.167	698.8702	1548.51	.	.V	.Q	.
16.250	709.6630	1567.11	.	.V	.Q	.
16.333	720.5890	1586.46	.	.V	.Q	.

16.417	731.6554	1606.84	.	.	V	.	.	Q	.
16.500	742.8604	1626.97	.	.	V	.	.	Q	.
16.583	754.1946	1645.72	.	.	V	.	.	Q	.
16.667	765.6841	1668.27	.	.	V	.	.	Q	.
16.750	777.3416	1692.67	.	.	V	.	.	Q	.
16.833	789.0895	1705.81	.	.	V	.	.	Q	.
16.917	800.9300	1719.24	.	.	V	.	.	Q	.
17.000	812.8705	1733.77	.	.	V	.	.	Q	.
17.083	824.8872	1744.82	.	.	V	.	.	Q	.
17.167	836.9738	1754.98	.	.	V	.	.	Q	.
17.250	849.1912	1773.96	.	.	V	.	.	Q	.
17.333	861.4782	1784.07	.	.	V	.	.	Q	.
17.417	873.7778	1785.90	.	.	V	.	.	Q	.
17.500	886.2596	1812.36	.	.	V	.	.	Q	.
17.583	898.7415	1812.37	.	.	V	.	.	Q	.
17.667	911.2945	1822.70	.	.	V	.	.	Q	.
17.750	923.9318	1834.94	.	.	V	.	.	Q	.
17.833	936.6547	1847.36	.	.	V	.	.	Q	.
17.917	949.4778	1861.92	.	.	V	.	.	Q	.
18.000	962.4279	1880.35	.	.	V	.	.	Q	.
18.083	975.3733	1879.68	.	.	V	.	.	Q	.
18.167	988.3271	1880.90	.	.	V	.	.	Q	.
18.250	1001.3829	1895.69	.	.	V	.	.	Q	.
18.333	1014.5629	1913.74	.	.	V	.	.	Q	.
18.417	1027.7632	1916.69	.	.	V	.	.	Q	.
18.500	1040.8542	1900.82	.	.	V	.	.	Q	.
18.583	1053.9033	1894.73	.	.	V	.	.	Q	.
18.667	1066.8972	1886.72	.	.	V	.	.	Q	.
18.750	1079.8792	1884.97	.	.	V	.	.	Q	.
18.833	1092.8696	1886.22	.	.	V	.	.	Q	.
18.917	1105.8243	1881.03	.	.	V	.	.	Q	.
19.000	1118.7053	1870.33	.	.	V	.	.	Q	.
19.083	1131.3949	1842.53	.	.	V	.	.	Q	.
19.167	1144.0626	1839.35	.	.	V	.	.	Q	.
19.250	1156.6912	1833.67	.	.	V	.	.	Q	.
19.333	1169.2552	1824.30	.	.	V	.	.	Q	.
19.417	1181.6465	1799.20	.	.	V	.	.	Q	.
19.500	1193.9833	1791.29	.	.	V	.	.	Q	.
19.583	1206.2352	1778.99	.	.	V	.	.	Q	.
19.667	1218.4835	1778.45	.	.	V	.	.	Q	.
19.750	1230.7056	1774.64	.	.	V	.	.	Q	.
19.833	1242.7590	1750.16	.	.	V	.	.	Q	.
19.917	1254.7113	1735.47	.	.	V	.	.	Q	.
20.000	1266.4775	1708.46	.	.	V	.	.	Q	.

-----  
 END OF FLOODSCx ROUTING ANALYSIS

**PRELIMINARY DRAFT – FOR INTERNAL USE ONLY**

**TECHNICAL APPENDIX I-C  
HYDROLOGIC ANALYSIS  
PROPOSED CONDITION  
10-YEAR EXPECTED VALUE**



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LP63010E.DAT  
TIME/DATE OF STUDY: 16:00 02/24/2004  
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=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	5.100
2)	10.000;	3.100
3)	15.000;	2.500
4)	20.000;	1.800
5)	30.000;	1.350
6)	60.000;	1.000
7)	120.000;	0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.180  
FOOTHILL 0.150  
MOUNTAIN 0.640  
VALLEY(UNDEVELOPED)/DESERT 0.030  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU62010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9034.05 Tc(MIN.) = 135.31  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.50  
TOTAL AREA(ACRES) = 46437.31  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9034.05 Tc(MIN.) = 135.31  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.50  
TOTAL AREA(ACRES) = 46437.31  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 345.00 DOWNSTREAM(FEET) = 319.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2852.00 CHANNEL SLOPE = 0.0091  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9034.05  
FLOW VELOCITY(FEET/SEC.) = 17.85 FLOW DEPTH(FEET) = 6.86  
TRAVEL TIME(MIN.) = 2.66 Tc(MIN.) = 137.97  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 137.97  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.607  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 88.70 0.40 1.00 40  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" A 4.40 0.40 0.50 32  
NATURAL FAIR COVER  
"GRASS" A 6.50 0.40 1.00 50  
NATURAL FAIR COVER  
"OPEN BRUSH" A 98.10 0.40 1.00 46  
COMMERCIAL A 1.30 0.40 0.10 32  
RESIDENTIAL  
"3-4 DWELLINGS/ACRE" A 12.90 0.40 0.60 32  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.96  
SUBAREA AREA(ACRES) = 211.90  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.33;30M= 0.64;1H= 0.88;3H= 1.66;6H= 2.48;24H= 4.38

S-GRAPH: VALLEY(DEV.)= 1.1%;VALLEY(UNDEV.)/DESERT= 19.8%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.30; LAG(HR) = 1.84; Fm(INCH/HR) = 0.23; Ybar = 0.50  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.91; 24HR = 0.95  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 46649.21  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0338; Lca/L=0.4,n=.0303; Lca/L=0.5,n=.0278;Lca/L=0.6,n=.0260  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8134.90  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8965.44  
TOTAL AREA(ACRES) = 46649.21 PEAK FLOW RATE(CFS) = 9034.05  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.28; 30M = 0.60; 1HR = 0.81; 3HR = 1.40; 6HR = 1.98; 24HR = 3.37

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 137.97

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	A	48.40	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	7.10	0.30	1.00	63
NATURAL FAIR COVER					
"GRASS"	B	5.60	0.30	1.00	69
NATURAL FAIR COVER					
"OPEN BRUSH"	B	11.60	0.30	1.00	66
COMMERCIAL	B	0.20	0.30	0.10	56
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	6.90	0.30	0.20	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.37

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93

SUBAREA AREA(ACRES) = 79.80

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.33;30M= 0.64;1H= 0.88;3H= 1.66;6H= 2.48;24H= 4.38

S-GRAPH: VALLEY(DEV.)= 1.1%;VALLEY(UNDEV.)/DESERT= 19.7%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.30; LAG(HR) = 1.84; Fm(INCH/HR) = 0.23; Ybar = 0.50

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.40; 1HR = 0.44;

3HR = 0.79; 6HR = 0.91; 24HR = 0.95

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 46729.02

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0338; Lca/L=0.4,n=.0303; Lca/L=0.5,n=.0278;Lca/L=0.6,n=.0260

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8133.91

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 8964.52

TOTAL AREA(ACRES) = 46729.02 PEAK FLOW RATE(CFS) = 9034.05

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.28; 30M = 0.60; 1HR = 0.81; 3HR = 1.40; 6HR = 1.98; 24HR = 3.37

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 137.97

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	B	4.20	0.30	0.60	56
NATURAL FAIR COVER					
"WOODLAND"	B	19.00	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	656.10	0.25	1.00	75
NATURAL POOR COVER					
"BARREN"	C	1.80	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	156.50	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	1039.10	0.25	1.00	77

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 1876.70

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.33;30M= 0.63;1H= 0.88;3H= 1.65;6H= 2.46;24H= 4.34

S-GRAPH: VALLEY(DEV.)= 1.8%;VALLEY(UNDEV.)/DESERT= 19.1%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.30; LAG(HR) = 1.84; Fm(INCH/HR) = 0.23; Ybar = 0.51

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.35; 30M = 0.40; 1HR = 0.44;

3HR = 0.79; 6HR = 0.91; 24HR = 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 48605.71

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0338; Lca/L=0.4,n=.0303; Lca/L=0.5,n=.0278;Lca/L=0.6,n=.0260

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8283.44

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9101.45

TOTAL AREA(ACRES) = 48605.71 PEAK FLOW RATE(CFS) = 9101.45

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.28; 30M = 0.60; 1HR = 0.81; 3HR = 1.40; 6HR = 1.98; 24HR = 3.37

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 137.97

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	C	80.90	0.25	0.20	69
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	54.20	0.25	1.00	81
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	C	28.70	0.25	0.60	69
NATURAL FAIR COVER					
"WOODLAND"	C	189.00	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	420.90	0.20	1.00	81
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	0.60	0.20	0.50	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90

SUBAREA AREA(ACRES) = 774.30

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.33;30M= 0.63;1H= 0.88;3H= 1.65;6H= 2.45;24H= 4.32

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 18.8%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.30; LAG(HR) = 1.84; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.35; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49380.01  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0338; Lca/L=0.4,n=.0303; Lca/L=0.5,n=.0278;Lca/L=0.6,n=.0260  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8367.00  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9182.62  
TOTAL AREA(ACRES) = 49380.01 PEAK FLOW RATE(CFS) = 9182.62

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.28; 30M = 0.60; 1HR = 0.81; 3HR = 1.40; 6HR = 1.98; 24HR = 3.37

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 137.97

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
-------------------------------	-------------------	-----------------	-----------------	-----------------	-----------

NATURAL POOR COVER					
"BARREN"	D	0.10	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	48.30	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	261.40	0.20	1.00	83
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	D	1.90	0.20	0.20	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	139.40	0.20	1.00	86
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	D	16.70	0.20	0.60	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98
SUBAREA AREA(ACRES) = 467.80

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.33;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.45;24H= 4.31

S-GRAPH: VALLEY(DEV.)= 2.2%;VALLEY(UNDEV.)/DESERT= 18.7%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.30; LAG(HR) = 1.84; Fm(INCH/HR) = 0.23; Ybar = 0.51

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49847.81

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0338; Lca/L=0.4,n=.0303; Lca/L=0.5,n=.0278;Lca/L=0.6,n=.0260

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8427.08

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9240.06

TOTAL AREA(ACRES) = 49847.81 PEAK FLOW RATE(CFS) = 9240.06

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.28; 30M = 0.60; 1HR = 0.81; 3HR = 1.40; 6HR = 1.98; 24HR = 3.37

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 137.97

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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NATURAL FAIR COVER					
"WOODLAND"	D	40.00	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00
SUBAREA AREA(ACRES) = 40.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.33;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.45;24H= 4.31

S-GRAPH: VALLEY(DEV.)= 2.2%;VALLEY(UNDEV.)/DESERT= 18.7%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.30; LAG(HR) = 1.84; Fm(INCH/HR) = 0.23; Ybar = 0.51

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49887.81

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0338; Lca/L=0.4,n=.0303; Lca/L=0.5,n=.0278;Lca/L=0.6,n=.0260

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8431.00

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9243.94

TOTAL AREA(ACRES) = 49887.81 PEAK FLOW RATE(CFS) = 9243.94

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.28; 30M = 0.60; 1HR = 0.81; 3HR = 1.40; 6HR = 1.98; 24HR = 3.37

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 49887.81 TC(MIN.) = 137.97

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.51

PEAK FLOW RATE(CFS) = 9243.94

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

=====

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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430 Exchange, Suite 200  
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714 - 734 - 5100

-----  
FILE NAME: LP64010E.DAT  
TIME/DATE OF STUDY: 16:00 02/24/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

--\*TIME-OF-CONCENTRATION MODEL\*--  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.390  
FOOTHILL 0.150  
MOUNTAIN 0.330  
VALLEY(UNDEVELOPED)/DESERT 0.130  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LP63010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9243.94 Tc(MIN.) = 137.97  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.51  
TOTAL AREA(ACRES) = 49887.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9243.94 Tc(MIN.) = 137.97  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.51  
TOTAL AREA(ACRES) = 49887.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 319.00 DOWNSTREAM(FEET) = 275.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5418.00 CHANNEL SLOPE = 0.0081  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9243.94  
FLOW VELOCITY(FEET/SEC.) = 17.30 FLOW DEPTH(FEET) = 7.18  
TRAVEL TIME(MIN.) = 5.22 Tc(MIN.) = 143.19  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 143.19  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.594  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 51.80 0.40 1.00 40  
NATURAL FAIR COVER  
"GRASS" A 0.20 0.40 1.00 50  
AGRICULTURAL FAIR COVER  
"ORCHARDS" A 0.20 0.40 1.00 44  
COMMERCIAL A 0.20 0.40 0.10 32  
RESIDENTIAL  
"11+ DWELLINGS/ACRE" A 4.80 0.40 0.20 32  
NATURAL FAIR COVER  
"WOODLAND" A 1.60 0.40 1.00 36  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
SUBAREA AREA(ACRES) = 58.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.33;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.45;24H= 4.31

S-GGRAPH: VALLEY(DEV.)= 2.2%;VALLEY(UNDEV.)/DESERT= 18.7%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.39; LAG(HR) = 1.91; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49946.61  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0257  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8427.43  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9186.87  
TOTAL AREA(ACRES) = 49946.61 PEAK FLOW RATE(CFS) = 9243.94  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 143.19  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	99.60	0.30	1.00	63
NATURAL FAIR COVER					
"GRASS"	B	14.70	0.30	1.00	69
NATURAL FAIR COVER					
"OPEN BRUSH"	B	20.00	0.30	1.00	66
COMMERCIAL	B	33.00	0.30	0.10	56
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	15.50	0.30	0.20	56
NATURAL FAIR COVER					
"WOODLAND"	B	7.40	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.78  
SUBAREA AREA(ACRES) = 190.20

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.33;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.44;24H= 4.31  
S-GGRAPH: VALLEY(DEV.)= 2.4%;VALLEY(UNDEV.)/DESERT= 18.7%  
MOUNTAIN= 63.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.39; LAG(HR) = 1.91; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 50136.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0257  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8435.95  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9197.45  
TOTAL AREA(ACRES) = 50136.80 PEAK FLOW RATE(CFS) = 9243.94  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 143.19  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	242.70	0.25	1.00	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	1.70	0.25	0.50	69
NATURAL FAIR COVER					
"GRASS"	C	27.20	0.25	1.00	79
URBAN FAIR COVER					
"TURF"	C	12.10	0.25	1.00	77
NATURAL FAIR COVER					
"OPEN BRUSH"	C	172.20	0.25	1.00	77
COMMERCIAL	C	38.30	0.25	0.10	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
SUBAREA AREA(ACRES) = 494.20

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.44;24H= 4.29  
S-GGRAPH: VALLEY(DEV.)= 2.7%;VALLEY(UNDEV.)/DESERT= 18.6%

MOUNTAIN= 63.6%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.39; LAG(HR) = 1.91; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 50631.01  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0257  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8469.14  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9233.85  
TOTAL AREA(ACRES) = 50631.01 PEAK FLOW RATE(CFS) = 9243.94  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 143.19  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	C	180.60	0.25	0.20	69
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	21.30	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	48.40	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	160.00	0.20	1.00	81
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	0.80	0.20	0.50	75
NATURAL FAIR COVER					
"GRASS"	D	28.00	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.67  
SUBAREA AREA(ACRES) = 439.10

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.64;6H= 2.43;24H= 4.28

S-GRAPH: VALLEY(DEV.)= 3.0%;VALLEY(UNDEV.)/DESERT= 18.6%  
MOUNTAIN= 63.3%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.39; LAG(HR) = 1.91; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51070.11  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0257  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8523.03  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9291.37  
TOTAL AREA(ACRES) = 51070.11 PEAK FLOW RATE(CFS) = 9291.37

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 143.19  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN FAIR COVER					
"TURF"	D	0.40	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	171.40	0.20	1.00	83
COMMERCIAL	D	51.30	0.20	0.10	75
PUBLIC PARK	D	7.90	0.20	0.85	75
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	D	154.70	0.20	0.20	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	24.20	0.20	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.58  
SUBAREA AREA(ACRES) = 409.90

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.63;6H= 2.43;24H= 4.27  
S-GRAPH: VALLEY(DEV.)= 3.3%;VALLEY(UNDEV.)/DESERT= 18.5%  
MOUNTAIN= 63.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.39; LAG(HR) = 1.91; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51480.01  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8583.50  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9354.92

TOTAL AREA(ACRES) = 51480.01 PEAK FLOW RATE(CFS) = 9354.92

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 143.19  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	D	1.30	0.20	0.60	75
NATURAL FAIR COVER					
"WOODLAND"	D	53.60	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99

SUBAREA AREA(ACRES) = 54.90

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.63;6H= 2.43;24H= 4.27  
S-GRAPH: VALLEY(DEV.)= 3.4%;VALLEY(UNDEV.)/DESERT= 18.5%  
MOUNTAIN= 63.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.39; LAG(HR) = 1.91; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51534.91  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0334; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0275;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8587.72  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9359.59

TOTAL AREA(ACRES) = 51534.91 PEAK FLOW RATE(CFS) = 9359.59

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

=====

END OF STUDY SUMMARY:  
TOTAL AREA(ACRES) = 51534.91 TC(MIN.) = 143.19  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.51  
PEAK FLOW RATE(CFS) = 9359.59

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LP65010E.DAT  
TIME/DATE OF STUDY: 16:00 02/24/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.570  
FOOTHILL 0.150  
MOUNTAIN 0.010  
VALLEY(UNDEVELOPED)/DESERT 0.270  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LP64010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9359.59 Tc(MIN.) = 143.19  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.51  
TOTAL AREA(ACRES) = 51534.91  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9359.59 Tc(MIN.) = 143.19  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.51  
TOTAL AREA(ACRES) = 51534.91  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 275.00 DOWNSTREAM(FEET) = 240.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5738.00 CHANNEL SLOPE = 0.0061  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9359.59  
FLOW VELOCITY(FEET/SEC.) = 15.76 FLOW DEPTH(FEET) = 7.85  
TRAVEL TIME(MIN.) = 6.07 Tc(MIN.) = 149.26  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 149.26  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.580  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.20	0.40	0.50	32
NATURAL FAIR COVER					
"GRASS"	A	11.30	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	49.50	0.40	1.00	49
NATURAL FAIR COVER					
"OPEN BRUSH"	A	0.70	0.40	1.00	46
COMMERCIAL	A	0.90	0.40	0.10	32
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	A	43.50	0.40	0.20	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.66  
SUBAREA AREA(ACRES) = 106.10  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.63;6H= 2.43;24H= 4.27

S-GRAPH: VALLEY(DEV.)= 3.5%;VALLEY(UNDEV.)/DESERT= 18.5%  
MOUNTAIN= 62.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51641.01  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0273;Lca/L=0.6,n=.0255  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8591.09  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9251.42  
TOTAL AREA(ACRES) = 51641.01 PEAK FLOW RATE(CFS) = 9359.59  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 149.26  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	A	6.90	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	6.70	0.30	1.00	63
NATURAL POOR COVER					
"BARREN"	B	0.70	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	36.10	0.30	1.00	69
URBAN FAIR COVER					
"TURF"	B	0.40	0.30	1.00	65
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	B	1.80	0.30	1.00	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 52.60  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.63;6H= 2.43;24H= 4.27  
S-GRAPH: VALLEY(DEV.)= 3.5%;VALLEY(UNDEV.)/DESERT= 18.5%  
MOUNTAIN= 62.8%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51693.61  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0273;Lca/L=0.6,n=.0255  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8591.13  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9252.21  
TOTAL AREA(ACRES) = 51693.61 PEAK FLOW RATE(CFS) = 9359.59  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 149.26  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	B	30.50	0.30	1.00	66
COMMERCIAL	B	3.90	0.30	0.10	56
PUBLIC PARK	B	0.20	0.30	0.85	56
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	60.30	0.30	0.20	56
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	B	82.10	0.30	0.60	56
NATURAL FAIR COVER					
"WOODLAND"	B	44.60	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.62  
SUBAREA AREA(ACRES) = 221.60  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.63;6H= 2.42;24H= 4.26  
S-GRAPH: VALLEY(DEV.)= 3.7%;VALLEY(UNDEV.)/DESERT= 18.6%  
MOUNTAIN= 62.6%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51915.21  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0273;Lca/L=0.6,n=.0255  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8607.23  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9272.45  
TOTAL AREA(ACRES) = 51915.21 PEAK FLOW RATE(CFS) = 9359.59  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 149.26  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	111.40	0.25	1.00	75
NATURAL FAIR COVER					
"GRASS"	C	42.10	0.25	1.00	79
URBAN FAIR COVER					
"TURF"	C	0.50	0.25	1.00	77
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	C	0.20	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	117.70	0.25	1.00	77
COMMERCIAL	C	4.20	0.25	0.10	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 276.10  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.88;3H= 1.63;6H= 2.42;24H= 4.26  
S-GRAPH: VALLEY(DEV.)= 4.0%;VALLEY(UNDEV.)/DESERT= 18.6%



MOUNTAIN= 62.3%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.51  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52191.31  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0273;Lca/L=0.6,n=.0255  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8623.63  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9292.22  
 TOTAL AREA(ACRES) = 52191.31 PEAK FLOW RATE(CFS) = 9359.59  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
 MAINLINE Tc(MIN) = 149.26

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	C	93.00	0.25	0.20	69
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	C	529.20	0.25	0.60	69
NATURAL FAIR COVER					
"WOODLAND"	C	106.50	0.25	1.00	73
PUBLIC PARK	D	1.80	0.20	0.85	75
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	1.90	0.20	1.00	81
NATURAL POOR COVER					
"BARREN"	D	0.70	0.20	1.00	93

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.61

SUBAREA AREA(ACRES) = 733.10

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.63;6H= 2.41;24H= 4.24  
 S-GRAPH: VALLEY(DEV.)= 4.8%;VALLEY(UNDEV.)/DESERT= 18.7%

MOUNTAIN= 61.4%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.51

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;

3HR = 0.77; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52924.41

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0273;Lca/L=0.6,n=.0255

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8699.58

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9380.91

TOTAL AREA(ACRES) = 52924.41 PEAK FLOW RATE(CFS) = 9380.91

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
 MAINLINE Tc(MIN) = 149.26

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	D	39.60	0.20	1.00	84
URBAN FAIR COVER					
"TURF"	D	3.30	0.20	1.00	82
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	11.70	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	55.00	0.20	1.00	83
COMMERCIAL	D	0.40	0.20	0.10	75
NATURAL GOOD COVER					
"MEADOWS"	D	2.00	0.20	1.00	78

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 112.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.62;6H= 2.41;24H= 4.24

S-GRAPH: VALLEY(DEV.)= 4.9%;VALLEY(UNDEV.)/DESERT= 18.7%

MOUNTAIN= 61.3%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.51

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;

3HR = 0.77; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53036.41

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0273;Lca/L=0.6,n=.0255

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8711.14

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9394.08

TOTAL AREA(ACRES) = 53036.41 PEAK FLOW RATE(CFS) = 9394.08

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
 MAINLINE Tc(MIN) = 149.26

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	D	68.90	0.20	0.20	75
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	D	109.80	0.20	0.60	75
NATURAL FAIR COVER					
"WOODLAND"	D	31.70	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.53

SUBAREA AREA(ACRES) = 210.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.62;6H= 2.41;24H= 4.23

S-GRAPH: VALLEY(DEV.)= 5.1%;VALLEY(UNDEV.)/DESERT= 18.8%

MOUNTAIN= 61.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.49; LAG(HR) = 1.99; Fm(INCH/HR) = 0.23; Ybar = 0.51

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;

3HR = 0.77; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53246.81

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0273;Lca/L=0.6,n=.0255  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8740.50  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9427.79  
TOTAL AREA(ACRES) = 53246.81 PEAK FLOW RATE(CFS) = 9427.79

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 53246.81 TC(MIN.) = 149.26  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.51  
PEAK FLOW RATE(CFS) = 9427.79

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LP66010E.DAT  
TIME/DATE OF STUDY: 16:00 02/24/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.240  
FOOTHILL 0.080  
MOUNTAIN 0.680  
VALLEY(UNDEVELOPED)/DESERT 0.000  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LP65010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9427.79 Tc(MIN.) = 149.26  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.51  
TOTAL AREA(ACRES) = 53246.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9427.79 Tc(MIN.) = 149.26  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.51  
TOTAL AREA(ACRES) = 53246.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 240.00 DOWNSTREAM(FEET) = 213.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6295.00 CHANNEL SLOPE = 0.0043  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9427.79  
FLOW VELOCITY(FEET/SEC.) = 11.57 FLOW DEPTH(FEET) = 8.06  
TRAVEL TIME(MIN.) = 9.07 Tc(MIN.) = 158.33  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 158.33  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.561  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SCS SOIL (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	A	19.80	0.40	0.85	32
AGRICULTURAL POOR COVER "FALLOW"	A	2.20	0.40	1.00	77
RESIDENTIAL "5-7 DWELLINGS/ACRE"	A	13.30	0.40	0.50	32
NATURAL POOR COVER "BARREN"	A	56.00	0.40	1.00	78
NATURAL FAIR COVER "GRASS"	A	51.40	0.40	1.00	50
URBAN FAIR COVER "TURF"	A	20.20	0.40	1.00	44

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
SUBAREA AREA(ACRES) = 162.90  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.62;6H= 2.41;24H= 4.23

S-GRAPH: VALLEY(DEV.)= 5.1%;VALLEY(UNDEV.)/DESERT= 18.7%  
MOUNTAIN= 61.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.51  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 53409.71  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8702.96  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9071.48  
TOTAL AREA(ACRES) = 53409.71 PEAK FLOW RATE(CFS) = 9427.79  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 158.33

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	120.00	0.40	1.00	49
NATURAL FAIR COVER					
"OPEN BRUSH"	A	4.00	0.40	1.00	46
COMMERCIAL	A	17.30	0.40	0.10	32
NATURAL GOOD COVER					
"MEADOWS"	A	0.40	0.40	1.00	30
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	A	7.10	0.40	0.20	32
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	1.30	0.40	1.00	40

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.86

SUBAREA AREA(ACRES) = 150.10

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.62;6H= 2.40;24H= 4.22

S-GRAPH: VALLEY(DEV.)= 5.2%;VALLEY(UNDEV.)/DESERT= 18.7%

MOUNTAIN= 61.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.51

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;

3HR = 0.77; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 53559.81

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8699.84

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9067.57

TOTAL AREA(ACRES) = 53559.81 PEAK FLOW RATE(CFS) = 9427.79

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 158.33

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	A	101.40	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	119.30	0.30	1.00	63
AGRICULTURAL POOR COVER					
"FALLOW"	B	19.80	0.30	1.00	86
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	201.90	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	189.50	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	335.80	0.30	1.00	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90

SUBAREA AREA(ACRES) = 967.70

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.62;6H= 2.39;24H= 4.20

S-GRAPH: VALLEY(DEV.)= 5.5%;VALLEY(UNDEV.)/DESERT= 18.3%

MOUNTAIN= 61.2%;FOOTHILL= 14.9%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.52

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;

3HR = 0.77; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 54527.51

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8739.13

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9098.45

TOTAL AREA(ACRES) = 54527.51 PEAK FLOW RATE(CFS) = 9427.79

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 158.33

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN FAIR COVER					
"TURF"	B	139.20	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	113.30	0.30	1.00	66
COMMERCIAL	B	352.90	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	174.00	0.30	1.00	69
PUBLIC PARK	B	22.20	0.30	0.85	56
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	85.90	0.30	0.20	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.56

SUBAREA AREA(ACRES) = 887.50

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.61;6H= 2.38;24H= 4.18

S-GRAPH: VALLEY(DEV.)= 5.8%;VALLEY(UNDEV.)/DESERT= 18.0%

MOUNTAIN= 61.3%;FOOTHILL= 14.8%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.52  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.32; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 55415.01  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8828.64  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9183.95  
 TOTAL AREA(ACRES) = 55415.01 PEAK FLOW RATE(CFS) = 9427.79  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 158.33

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	B	2.40	0.30	1.00	72
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	B	76.70	0.30	0.60	56
NATURAL FAIR COVER					
"WOODLAND"	B	223.60	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	252.20	0.25	1.00	75
AGRICULTURAL POOR COVER					
"FALLOW"	C	67.20	0.25	1.00	91
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	322.30	0.25	0.50	69

"5-7 DWELLINGS/ACRE"	C	322.30	0.25	0.50	69
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.80

SUBAREA AREA(ACRES) = 944.40

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.87;3H= 1.61;6H= 2.37;24H= 4.17

S-GRAPH: VALLEY(DEV.)= 6.1%;VALLEY(UNDEV.)/DESERT= 17.7%

MOUNTAIN= 61.4%;FOOTHILL= 14.7%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.52

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.32; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 56359.41

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 8893.07

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9243.05

TOTAL AREA(ACRES) = 56359.41 PEAK FLOW RATE(CFS) = 9427.79

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 158.33

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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NATURAL POOR COVER					
"BARREN"	C	117.80	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	615.70	0.25	1.00	79
URBAN FAIR COVER					
"TURF"	C	52.40	0.25	1.00	77
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	C	183.90	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	1315.50	0.25	1.00	77
COMMERCIAL	C	417.30	0.25	0.10	69

COMMERCIAL	C	417.30	0.25	0.10	69
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SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.86

SUBAREA AREA(ACRES) = 2702.60

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.32;30M= 0.63;1H= 0.86;3H= 1.59;6H= 2.35;24H= 4.11

S-GRAPH: VALLEY(DEV.)= 6.9%;VALLEY(UNDEV.)/DESERT= 16.9%

MOUNTAIN= 61.7%;FOOTHILL= 14.4%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.52

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.37; 1HR = 0.41;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 59062.01

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9139.22

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9460.02

TOTAL AREA(ACRES) = 59062.01 PEAK FLOW RATE(CFS) = 9460.02

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 158.33

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
-------------------------------	-------------------	-----------------	-----------------	-----------------	-----------

PUBLIC PARK	C	0.70	0.25	0.85	69
NATURAL GOOD COVER					
"MEADOWS"	C	4.00	0.25	1.00	71
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	C	460.80	0.25	0.20	69
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	26.10	0.25	1.00	81
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	C	228.40	0.25	0.60	69
NATURAL FAIR COVER					
"WOODLAND"	C	211.80	0.25	1.00	73

"WOODLAND"	C	211.80	0.25	1.00	73
------------	---	--------	------	------	----

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.51

SUBAREA AREA(ACRES) = 931.80

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.63;1H= 0.86;3H= 1.59;6H= 2.34;24H= 4.10

S-GRAPH: VALLEY(DEV.)= 7.2%;VALLEY(UNDEV.)/DESERT= 16.7%

MOUNTAIN= 61.8%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.23; Ybar = 0.52  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.37; 1HR = 0.41;  
 3HR = 0.76; 6HR = 0.89; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 59993.81  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9261.02  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9577.42  
 TOTAL AREA(ACRES) = 59993.81 PEAK FLOW RATE(CFS) = 9577.42

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 158.33

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	112.90	0.20	1.00	81
PUBLIC PARK	D	44.50	0.20	0.85	75
AGRICULTURAL POOR COVER					
"FALLOW"	D	12.50	0.20	1.00	94
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	91.50	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	9.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	204.00	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.89

SUBAREA AREA(ACRES) = 475.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.63;1H= 0.86;3H= 1.59;6H= 2.34;24H= 4.09

S-GRAPH: VALLEY(DEV.)= 7.3%;VALLEY(UNDEV.)/DESERT= 16.5%

MOUNTAIN= 61.9%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.22; Ybar = 0.52

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;

3HR = 0.76; 6HR = 0.89; 24HR = 0.94

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 60468.81

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9313.86

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9625.87

TOTAL AREA(ACRES) = 60468.81 PEAK FLOW RATE(CFS) = 9625.87

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 158.33

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	0.40	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	5.80	0.20	1.00	82
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	95.90	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	171.90	0.20	1.00	83
COMMERCIAL	D	35.50	0.20	0.10	75
NATURAL GOOD COVER					
"MEADOWS"	D	1.60	0.20	1.00	78

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90

SUBAREA AREA(ACRES) = 311.10

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.63;1H= 0.86;3H= 1.58;6H= 2.33;24H= 4.08

S-GRAPH: VALLEY(DEV.)= 7.4%;VALLEY(UNDEV.)/DESERT= 16.5%

MOUNTAIN= 61.9%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.22; Ybar = 0.52

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;

3HR = 0.75; 6HR = 0.89; 24HR = 0.94

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 60779.91

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9349.88

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9658.56

TOTAL AREA(ACRES) = 60779.91 PEAK FLOW RATE(CFS) = 9658.56

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 158.33

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	D	357.30	0.20	0.20	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	11.30	0.20	1.00	86
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	D	309.70	0.20	0.60	75
NATURAL FAIR COVER					
"WOODLAND"	D	41.70	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.43

SUBAREA AREA(ACRES) = 720.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.58;6H= 2.33;24H= 4.07

S-GRAPH: VALLEY(DEV.)= 7.6%;VALLEY(UNDEV.)/DESERT= 16.3%

MOUNTAIN= 62.0%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.64; LAG(HR) = 2.11; Fm(INCH/HR) = 0.22; Ybar = 0.52

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;

3HR = 0.75; 6HR = 0.89; 24HR = 0.94

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 61499.91

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0300; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0257  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9461.70  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9766.93  
TOTAL AREA(ACRES) = 61499.91 PEAK FLOW RATE(CFS) = 9766.93

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 61499.91 TC(MIN.) = 158.33  
AREA-AVERAGED Fm(INCH/HR)= 0.22 Ybar = 0.52  
PEAK FLOW RATE(CFS) = 9766.93

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LP67010E.DAT  
TIME/DATE OF STUDY: 16:00 02/24/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.160  
FOOTHILL 0.140  
MOUNTAIN 0.620  
VALLEY(UNDEVELOPED)/DESERT 0.080  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LP66010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9766.93 Tc(MIN.) = 158.33  
AREA-AVERAGED Fm(INCH/HR) = 0.22 Ybar = 0.52  
TOTAL AREA(ACRES) = 61499.91  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9766.93 Tc(MIN.) = 158.33  
AREA-AVERAGED Fm(INCH/HR) = 0.22 Ybar = 0.52  
TOTAL AREA(ACRES) = 61499.91  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 213.00 DOWNSTREAM(FEET) = 176.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6201.00 CHANNEL SLOPE = 0.0060  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9766.93  
FLOW VELOCITY(FEET/SEC.) = 13.06 FLOW DEPTH(FEET) = 7.48  
TRAVEL TIME(MIN.) = 7.91 Tc(MIN.) = 166.24  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 166.24  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.545  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER					
"FALLOW"	A	0.20	0.40	1.00	77
NATURAL FAIR COVER					
"GRASS"	A	0.90	0.40	1.00	50
NATURAL FAIR COVER					
"OPEN BRUSH"	A	8.90	0.40	1.00	46
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	5.50	0.40	1.00	49
NATURAL FAIR COVER					
"WOODLAND"	A	17.90	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	23.90	0.30	1.00	63
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =			0.36		
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =			1.00		
SUBAREA AREA(ACRES) =		57.30			

UNIT-HYDROGRAPH DATA:



RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.58;6H= 2.33;24H= 4.07  
 S-GRAPH: VALLEY(DEV.)= 7.6%;VALLEY(UNDEV.)/DESERT= 16.3%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.22; Ybar = 0.52  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 61557.22  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9459.53  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9627.46  
 TOTAL AREA(ACRES) = 61557.22 PEAK FLOW RATE(CFS) = 9766.93  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 166.24  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER "FALLOW"	B	180.40	0.30	1.00	86
RESIDENTIAL "5-7 DWELLINGS/ACRE"	B	89.60	0.30	0.50	56
NATURAL FAIR COVER "GRASS"	B	327.50	0.30	1.00	69
AGRICULTURAL FAIR COVER "ORCHARDS"	B	6.00	0.30	1.00	65
URBAN FAIR COVER "TURF"	B	105.00	0.30	1.00	65
NATURAL FAIR COVER "OPEN BRUSH"	B	118.90	0.30	1.00	66

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
 SUBAREA AREA(ACRES) = 827.40  
 UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.58;6H= 2.32;24H= 4.06  
 S-GRAPH: VALLEY(DEV.)= 7.7%;VALLEY(UNDEV.)/DESERT= 16.1%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.22; Ybar = 0.52  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 62384.62  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9498.12  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9656.73  
 TOTAL AREA(ACRES) = 62384.62 PEAK FLOW RATE(CFS) = 9766.93  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
 \*\*\*\*\*  
 MAINLINE Tc(MIN) = 166.24  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL AGRICULTURAL FAIR COVER "PASTURE, DRYLAND"	B	7.80	0.30	0.10	56
NATURAL GOOD COVER "MEADOWS"	B	418.80	0.30	1.00	69
NATURAL FAIR COVER "CHAPARRAL, NARROWLEAF"	B	0.90	0.30	1.00	58
RESIDENTIAL "3-4 DWELLINGS/ACRE"	B	0.40	0.30	1.00	72
NATURAL FAIR COVER "WOODLAND"	B	50.90	0.30	0.60	56
SCS AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95 SUBAREA AREA(ACRES) = 530.50	B	51.70	0.30	1.00	60

 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.58;6H= 2.32;24H= 4.05  
 S-GRAPH: VALLEY(DEV.)= 7.8%;VALLEY(UNDEV.)/DESERT= 16.1%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.22; Ybar = 0.52  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.40;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 62915.12  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9512.32  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9666.58  
 TOTAL AREA(ACRES) = 62915.12 PEAK FLOW RATE(CFS) = 9766.93  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 166.24  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL, BROADLEAF"	C	203.60	0.25	1.00	75
AGRICULTURAL POOR COVER "FALLOW"	C	124.30	0.25	1.00	91
NATURAL POOR COVER "BARREN"	C	7.60	0.25	1.00	91
NATURAL FAIR COVER "GRASS"	C	485.30	0.25	1.00	79
AGRICULTURAL FAIR COVER "ORCHARDS"	C	0.70	0.25	1.00	77
URBAN FAIR COVER "TURF"	C	4.90	0.25	1.00	77

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 826.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.57;6H= 2.31;24H= 4.03  
 S-GRAPH: VALLEY(DEV.)= 7.9%;VALLEY(UNDEV.)/DESERT= 16.0%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.22; Ybar = 0.52  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.40;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 63741.52  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9581.09  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9725.38  
 TOTAL AREA(ACRES) = 63741.52 PEAK FLOW RATE(CFS) = 9766.93  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----  
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
 -----  
 MAINLINE Tc(MIN) = 166.24  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	C	940.00	0.25	1.00	77
COMMERCIAL	C	10.80	0.25	0.10	69
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	C	128.10	0.25	1.00	79
NATURAL GOOD COVER					
"MEADOWS"	C	0.20	0.25	1.00	71
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	C	17.90	0.25	0.20	69
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	C	125.40	0.25	0.60	69

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
 SUBAREA AREA(ACRES) = 1222.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.57;6H= 2.30;24H= 4.02  
 S-GRAPH: VALLEY(DEV.)= 8.1%;VALLEY(UNDEV.)/DESERT= 15.8%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.22; Ybar = 0.53  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 64963.91  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9667.83  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9800.48  
 TOTAL AREA(ACRES) = 64963.91 PEAK FLOW RATE(CFS) = 9800.48

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 166.24  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	C	94.10	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	D	159.90	0.20	1.00	81
AGRICULTURAL POOR COVER					
"FALLOW"	D	77.90	0.20	1.00	94
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	104.60	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	0.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	635.30	0.20	1.00	84

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
 SUBAREA AREA(ACRES) = 1072.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.86;3H= 1.56;6H= 2.29;24H= 4.00  
 S-GRAPH: VALLEY(DEV.)= 8.2%;VALLEY(UNDEV.)/DESERT= 15.7%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.22; Ybar = 0.53  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 66036.31  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9780.79  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9901.89  
 TOTAL AREA(ACRES) = 66036.31 PEAK FLOW RATE(CFS) = 9901.89

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----  
 >>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
 -----  
 MAINLINE Tc(MIN) = 166.24  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	0.90	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	8.20	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	334.50	0.20	1.00	83
COMMERCIAL	D	11.70	0.20	0.10	75
PUBLIC PARK	D	0.10	0.20	0.85	75
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	D	3.80	0.20	0.20	75

 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.96  
 SUBAREA AREA(ACRES) = 359.20  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.29;24H= 3.99  
 S-GRAPH: VALLEY(DEV.)= 8.2%;VALLEY(UNDEV.)/DESERT= 15.7%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.22; Ybar = 0.53  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 66395.52  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9817.78  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9934.98  
 TOTAL AREA(ACRES) = 66395.52 PEAK FLOW RATE(CFS) = 9934.98

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*

FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

=====

MAINLINE Tc(MIN) = 166.24

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	7.80	0.20	1.00	86
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	61.40	0.20	1.00	84
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	D	156.10	0.20	0.60	75
NATURAL FAIR COVER					
"WOODLAND"	D	63.80	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.78

SUBAREA AREA(ACRES) = 289.10

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.29;24H= 3.99

S-GRAPH: VALLEY(DEV.)= 8.3%;VALLEY(UNDEV.)/DESERT= 15.6%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.77; LAG(HR) = 2.22; Fm(INCH/HR) = 0.22; Ybar = 0.53

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;

3HR = 0.74; 6HR = 0.89; 24HR= 0.93

UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 66684.62

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0335; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9848.72

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9963.32

TOTAL AREA(ACRES) = 66684.62 PEAK FLOW RATE(CFS) = 9963.32

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 66684.62 TC(MIN.) = 166.24

AREA-AVERAGED Fm(INCH/HR)= 0.22 Ybar = 0.53

PEAK FLOW RATE(CFS) = 9963.32

=====

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LP68010E.DAT  
TIME/DATE OF STUDY: 16:00 02/24/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
USER SPECIFIED STORM EVENT(YEAR) = 10.00  
SPECIFIED MINIMUM PIPE SIZE(INCH) = 18.00  
SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 5.100  
2) 10.000; 3.100  
3) 15.000; 2.500  
4) 20.000; 1.800  
5) 30.000; 1.350  
6) 60.000; 1.000  
7) 120.000; 0.770

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.250  
FOOTHILL 0.140  
MOUNTAIN 0.180  
VALLEY(UNDEVELOPED)/DESERT 0.430  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LP67010E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9963.32 Tc(MIN.) = 166.24  
AREA-AVERAGED Fm(INCH/HR) = 0.22 Ybar = 0.53  
TOTAL AREA(ACRES) = 66684.62  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 9963.32 Tc(MIN.) = 166.24  
AREA-AVERAGED Fm(INCH/HR) = 0.22 Ybar = 0.53  
TOTAL AREA(ACRES) = 66684.62  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 176.00 DOWNSTREAM(FEET) = 133.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6324.00 CHANNEL SLOPE = 0.0068  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 9963.32  
FLOW VELOCITY(FEET/SEC.) = 13.74 FLOW DEPTH(FEET) = 7.28  
TRAVEL TIME(MIN.) = 7.67 Tc(MIN.) = 173.91  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 173.91  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.531  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 1.30 0.40 1.00 40  
NATURAL GOOD COVER  
"MEADOWS" A 0.30 0.40 1.00 30  
NATURAL FAIR COVER  
"GRASS" A 1.80 0.40 1.00 50  
AGRICULTURAL FAIR COVER  
"ORCHARDS" A 0.90 0.40 1.00 44  
NATURAL FAIR COVER  
"OPEN BRUSH" A 3.10 0.40 1.00 46  
COMMERCIAL A 23.30 0.40 0.10 32  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.32  
SUBAREA AREA(ACRES) = 30.70  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.29;24H= 3.99

S-GRAPH: VALLEY(DEV.)= 8.3%;VALLEY(UNDEV.)/DESERT= 15.6%  
MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.22; Ybar = 0.53  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 66715.32  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9852.73  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9842.53  
TOTAL AREA(ACRES) = 66715.32 PEAK FLOW RATE(CFS) = 9963.32  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 173.91  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	1.60	0.40	1.00	49
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	A	6.70	0.40	0.20	32
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	A	33.60	0.40	0.60	32
NATURAL FAIR COVER					
"WOODLAND"	A	19.30	0.40	1.00	36
AGRICULTURAL POOR COVER					
"FALLOW"	B	4.10	0.30	1.00	86
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	16.50	0.30	0.50	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.38  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.67  
SUBAREA AREA(ACRES) = 81.80  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.29;24H= 3.99  
S-GRAPH: VALLEY(DEV.)= 8.3%;VALLEY(UNDEV.)/DESERT= 15.7%  
MOUNTAIN= 61.9%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.22; Ybar = 0.53  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 66797.12  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9856.00  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9845.57  
TOTAL AREA(ACRES) = 66797.12 PEAK FLOW RATE(CFS) = 9963.32  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 173.91  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER					
"BARREN"	B	2.00	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	7.10	0.30	1.00	69
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	0.40	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	0.70	0.30	1.00	66
COMMERCIAL	B	42.80	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	10.70	0.30	1.00	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.40  
SUBAREA AREA(ACRES) = 63.70  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.29;24H= 3.99  
S-GRAPH: VALLEY(DEV.)= 8.3%;VALLEY(UNDEV.)/DESERT= 15.7%  
MOUNTAIN= 61.9%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.22; Ybar = 0.53  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 66860.82  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9864.94  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9854.18  
TOTAL AREA(ACRES) = 66860.82 PEAK FLOW RATE(CFS) = 9963.32  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 173.91  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	77.60	0.30	0.20	56
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	B	14.90	0.30	0.60	56
NATURAL FAIR COVER					
"WOODLAND"	B	6.90	0.30	1.00	60
NATURAL FAIR COVER					
"GRASS"	C	218.60	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	70.80	0.25	1.00	77
COMMERCIAL	C	12.90	0.25	0.10	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.80  
SUBAREA AREA(ACRES) = 401.70  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.28;24H= 3.98

S-GRAPH: VALLEY(DEV.)= 8.4%;VALLEY(UNDEV.)/DESERT= 15.9%  
MOUNTAIN= 61.6%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.22; Ybar = 0.53  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 67262.52  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9902.20  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9889.17  
TOTAL AREA(ACRES) = 67262.52 PEAK FLOW RATE(CFS) = 9963.32  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 173.91  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	C	0.20	0.25	0.85	69
RESIDENTIAL "3-4 DWELLINGS/ACRE"	C	0.90	0.25	0.60	69
NATURAL FAIR COVER "WOODLAND"	C	19.50	0.25	1.00	73
AGRICULTURAL POOR COVER "FALLOW"	D	35.60	0.20	1.00	94
RESIDENTIAL "5-7 DWELLINGS/ACRE"	D	140.20	0.20	0.50	75
NATURAL POOR COVER "BARREN"	D	0.60	0.20	1.00	93

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.64  
SUBAREA AREA(ACRES) = 197.00

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.28;24H= 3.98  
S-GRAPH: VALLEY(DEV.)= 8.5%;VALLEY(UNDEV.)/DESERT= 15.9%  
MOUNTAIN= 61.5%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.22; Ybar = 0.53  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 67459.52  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9928.78  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9914.60  
TOTAL AREA(ACRES) = 67459.52 PEAK FLOW RATE(CFS) = 9963.32  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 173.91  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "GRASS"	D	332.20	0.20	1.00	84
AGRICULTURAL FAIR COVER "ORCHARDS"	D	1.10	0.20	1.00	82
URBAN FAIR COVER "TURF"	D	1.20	0.20	1.00	82
NATURAL FAIR COVER "OPEN BRUSH"	D	172.80	0.20	1.00	83
COMMERCIAL AGRICULTURAL FAIR COVER "PASTURE,DRYLAND"	D	60.20	0.20	0.10	75
D		1.80	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
SUBAREA AREA(ACRES) = 569.30

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.56;6H= 2.28;24H= 3.97  
S-GRAPH: VALLEY(DEV.)= 8.6%;VALLEY(UNDEV.)/DESERT= 16.2%  
MOUNTAIN= 61.1%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.22; Ybar = 0.53  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 68028.82  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 9993.86  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 9975.71  
TOTAL AREA(ACRES) = 68028.82 PEAK FLOW RATE(CFS) = 9975.71

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 173.91  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 0.770  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "11+ DWELLINGS/ACRE"	D	143.90	0.20	0.20	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	4.90	0.20	1.00	81
RESIDENTIAL "3-4 DWELLINGS/ACRE"	D	6.00	0.20	0.60	75
NATURAL FAIR COVER "WOODLAND"	D	61.30	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.46  
SUBAREA AREA(ACRES) = 216.10

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.31;30M= 0.62;1H= 0.85;3H= 1.55;6H= 2.28;24H= 3.97  
S-GRAPH: VALLEY(DEV.)= 8.7%;VALLEY(UNDEV.)/DESERT= 16.2%

MOUNTAIN= 61.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.90; LAG(HR) = 2.32; Fm(INCH/HR) = 0.22; Ybar = 0.52  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;

3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 20.00 TOTAL AREA(ACRES) = 68244.92  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0336; Lca/L=0.4,n=.0301; Lca/L=0.5,n=.0276;Lca/L=0.6,n=.0258  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 10026.41  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 10007.13  
TOTAL AREA(ACRES) = 68244.92 PEAK FLOW RATE(CFS) = 10007.13

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.26; 30M = 0.59; 1HR = 0.78; 3HR = 1.31; 6HR = 1.81; 24HR = 3.03

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 68244.92 TC(MIN.) = 173.91  
AREA-AVERAGED Fm(INCH/HR)= 0.22 Ybar = 0.52  
PEAK FLOW RATE(CFS) = 10007.13

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

**PRELIMINARY DRAFT – FOR INTERNAL USE ONLY**

**TECHNICAL APPENDIX I-C  
HYDROLOGIC ANALYSIS  
PROPOSED CONDITION  
100-YEAR EXPECTED VALUE**



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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-----  
FILE NAME: LP63100E.DAT  
TIME/DATE OF STUDY: 08:03 02/26/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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

\*USER-DEFINED TABLED RAINFALL USED\*

NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 7.600
- 2) 10.000; 4.500
- 3) 15.000; 3.500
- 4) 20.000; 2.750
- 5) 30.000; 2.100
- 6) 60.000; 1.520
- 7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL\*

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / OUT- / PARK- SIDE / SIDE / WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*

\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:

WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.180
FOOTHILL	0.150
MOUNTAIN	0.640
VALLEY(UNDEVELOPED)/DESERT	0.030
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.

SIERRA MADRE DEPTH-AREA FACTORS USED.

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<

=====

PEAK FLOWRATE TABLE FILE NAME: LU62100E.DNA

MEMORY BANK # 1 DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 17976.47 Tc(MIN.) = 115.61

AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.38

TOTAL AREA(ACRES) = 46437.31

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<

=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:

PEAK FLOW RATE(CFS) = 17976.47 Tc(MIN.) = 115.61

AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.38

TOTAL AREA(ACRES) = 46437.31

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<

>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<

=====

ELEVATION DATA: UPSTREAM(FEET) = 345.00 DOWNSTREAM(FEET) = 319.00

CHANNEL LENGTH THRU SUBAREA(FEET) = 2852.00 CHANNEL SLOPE = 0.0091

CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000

MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00

CHANNEL FLOW THRU SUBAREA(CFS) = 17976.47

FLOW VELOCITY(FEET/SEC.) = 22.15 FLOW DEPTH(FEET) = 10.11

TRAVEL TIME(MIN.) = 2.15 Tc(MIN.) = 117.76

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 117.76

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.012

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	88.70	0.40	1.00	40
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	4.40	0.40	0.50	32
NATURAL FAIR COVER					
"GRASS"	A	6.50	0.40	1.00	50
NATURAL FAIR COVER					
"OPEN BRUSH"	A	98.10	0.40	1.00	46
COMMERCIAL	A	1.30	0.40	0.10	32
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	A	12.90	0.40	0.60	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.96

SUBAREA AREA(ACRES) = 211.90

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.52;30M= 0.96;1H= 1.33;3H= 2.51;6H= 3.77;24H= 6.64

S-GRAPH: VALLEY(DEV.)= 1.1%;VALLEY(UNDEV.)/DESERT= 19.8%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.96; LAG(HR) = 1.57; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.91; 24HR= 0.95  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 46649.21  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0222  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 15434.30  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 17954.15  
TOTAL AREA(ACRES) = 46649.21 PEAK FLOW RATE(CFS) = 17976.47  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.43; 30M = 0.89; 1HR = 1.20; 3HR = 2.09; 6HR = 2.98; 24HR = 5.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 117.76

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.212  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"WOODLAND" A 48.40 0.40 1.00 36  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 7.10 0.30 1.00 63  
NATURAL FAIR COVER  
"GRASS" B 5.60 0.30 1.00 69  
NATURAL FAIR COVER  
"OPEN BRUSH" B 11.60 0.30 1.00 66  
COMMERCIAL B 0.20 0.30 0.10 56  
RESIDENTIAL  
"11+ DWELLINGS/ACRE" B 6.90 0.30 0.20 56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.37  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
SUBAREA AREA(ACRES) = 79.80

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.52;30M= 0.96;1H= 1.33;3H= 2.51;6H= 3.77;24H= 6.63  
S-GRAPH: VALLEY(DEV.)= 1.1%;VALLEY(UNDEV.)/DESERT= 19.7%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.96; LAG(HR) = 1.57; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.91; 24HR= 0.95  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 46729.02  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0222  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 15436.59  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 17959.25  
TOTAL AREA(ACRES) = 46729.02 PEAK FLOW RATE(CFS) = 17976.47  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.43; 30M = 0.89; 1HR = 1.20; 3HR = 2.09; 6HR = 2.98; 24HR = 5.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 117.76

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.212  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
RESIDENTIAL  
"3-4 DWELLINGS/ACRE" B 4.20 0.30 0.60 56  
NATURAL FAIR COVER  
"WOODLAND" B 19.00 0.30 1.00 60  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 656.10 0.25 1.00 75  
NATURAL POOR COVER  
"BARREN" C 1.80 0.25 1.00 91  
NATURAL FAIR COVER  
"GRASS" C 156.50 0.25 1.00 79  
NATURAL FAIR COVER  
"OPEN BRUSH" C 1039.10 0.25 1.00 77

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1876.70

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.33;3H= 2.50;6H= 3.74;24H= 6.57  
S-GRAPH: VALLEY(DEV.)= 1.8%;VALLEY(UNDEV.)/DESERT= 19.1%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.96; LAG(HR) = 1.57; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.35; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.91; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 48605.71  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0222  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 15773.01  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18306.46  
TOTAL AREA(ACRES) = 48605.71 PEAK FLOW RATE(CFS) = 18306.46

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.43; 30M = 0.89; 1HR = 1.20; 3HR = 2.09; 6HR = 2.98; 24HR = 5.03

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 117.76

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.212  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
RESIDENTIAL  
"11+ DWELLINGS/ACRE" C 80.90 0.25 0.20 69  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 54.20 0.25 1.00 81  
RESIDENTIAL  
"3-4 DWELLINGS/ACRE" C 28.70 0.25 0.60 69  
NATURAL FAIR COVER  
"WOODLAND" C 189.00 0.25 1.00 73  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 420.90 0.20 1.00 81  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" D 0.60 0.20 0.50 75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
SUBAREA AREA(ACRES) = 774.30

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.49;6H= 3.72;24H= 6.55  
S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 18.8%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.96; LAG(HR) = 1.57; Fm(INCH/HR) = 0.23; Ybar = 0.39

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.35; 30M = 0.40; 1HR = 0.44;  
 3HR = 0.79; 6HR = 0.90; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49380.01  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0222  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 15936.11  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18476.17  
 TOTAL AREA(ACRES) = 49380.01 PEAK FLOW RATE(CFS) = 18476.17

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.43; 30M = 0.89; 1HR = 1.20; 3HR = 2.09; 6HR = 2.98; 24HR = 5.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

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MAINLINE Tc(MIN) = 117.76  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.212  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER "BARREN"	D	0.10	0.20	1.00	93
NATURAL FAIR COVER "GRASS"	D	48.30	0.20	1.00	84
NATURAL FAIR COVER "OPEN BRUSH"	D	261.40	0.20	1.00	83
RESIDENTIAL "11+ DWELLINGS/ACRE"	D	1.90	0.20	0.20	75
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	139.40	0.20	1.00	86
RESIDENTIAL "3-4 DWELLINGS/ACRE"	D	16.70	0.20	0.60	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98  
 SUBAREA AREA(ACRES) = 467.80

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.49;6H= 3.72;24H= 6.53  
 S-GRAPH: VALLEY(DEV.)= 2.2%;VALLEY(UNDEV.)/DESERT= 18.7%  
 MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.96; LAG(HR) = 1.57; Fm(INCH/HR) = 0.23; Ybar = 0.39  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49847.81  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0222  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16046.13  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18585.46  
 TOTAL AREA(ACRES) = 49847.81 PEAK FLOW RATE(CFS) = 18585.46

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.43; 30M = 0.89; 1HR = 1.20; 3HR = 2.09; 6HR = 2.98; 24HR = 5.03

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 117.76  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.212  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER "BARREN"	D	0.10	0.20	1.00	93
NATURAL FAIR COVER "GRASS"	D	48.30	0.20	1.00	84
NATURAL FAIR COVER "OPEN BRUSH"	D	261.40	0.20	1.00	83
RESIDENTIAL "11+ DWELLINGS/ACRE"	D	1.90	0.20	0.20	75
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	139.40	0.20	1.00	86
RESIDENTIAL "3-4 DWELLINGS/ACRE"	D	16.70	0.20	0.60	75

NATURAL FAIR COVER  
 "WOODLAND" D 40.00 0.20 1.00 79  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 40.00  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.49;6H= 3.72;24H= 6.53  
 S-GRAPH: VALLEY(DEV.)= 2.2%;VALLEY(UNDEV.)/DESERT= 18.7%  
 MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 1.96; LAG(HR) = 1.57; Fm(INCH/HR) = 0.23; Ybar = 0.39  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49887.81  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0288; Lca/L=0.4,n=.0258; Lca/L=0.5,n=.0237;Lca/L=0.6,n=.0222  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16054.15  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18593.85  
 TOTAL AREA(ACRES) = 49887.81 PEAK FLOW RATE(CFS) = 18593.85

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.43; 30M = 0.89; 1HR = 1.20; 3HR = 2.09; 6HR = 2.98; 24HR = 5.03  
 =====  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 49887.81 TC(MIN.) = 117.76  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.39  
 PEAK FLOW RATE(CFS) = 18593.85  
 =====  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LP64100E.DAT  
TIME/DATE OF STUDY: 08:03 02/26/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

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--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	7.600
2)	10.000;	4.500
3)	15.000;	3.500
4)	20.000;	2.750
5)	30.000;	2.100
6)	60.000;	1.520
7)	120.000;	1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)

VALLEY(DEVELOPED)	0.390
FOOTHILL	0.150
MOUNTAIN	0.330
VALLEY(UNDEVELOPED)/DESERT	0.130
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LP63100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18593.85 Tc(MIN.) = 117.76  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.39  
TOTAL AREA(ACRES) = 49887.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18593.85 Tc(MIN.) = 117.76  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.39  
TOTAL AREA(ACRES) = 49887.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 319.00 DOWNSTREAM(FEET) = 275.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5418.00 CHANNEL SLOPE = 0.0081  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 18593.85  
FLOW VELOCITY(FEET/SEC.) = 21.50 FLOW DEPTH(FEET) = 10.64  
TRAVEL TIME(MIN.) = 4.20 Tc(MIN.) = 121.96  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 121.96  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.992  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	A	51.80	0.40	1.00	40
NATURAL FAIR COVER "GRASS"	A	0.20	0.40	1.00	50
AGRICULTURAL FAIR COVER "ORCHARDS"	A	0.20	0.40	1.00	44
COMMERCIAL RESIDENTIAL	A	0.20	0.40	0.10	32
"11+ DWELLINGS/ACRE"	A	4.80	0.40	0.20	32
NATURAL FAIR COVER "WOODLAND"	A	1.60	0.40	1.00	36

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
SUBAREA AREA(ACRES) = 58.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.48;6H= 3.72;24H= 6.53

S-GRAPH: VALLEY(DEV.)= 2.2%;VALLEY(UNDEV.)/DESERT= 18.7%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.03; LAG(HR) = 1.63; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 49946.61  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0219  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16051.12  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18485.89  
TOTAL AREA(ACRES) = 49946.61 PEAK FLOW RATE(CFS) = 18593.85  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 121.96  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	99.60	0.30	1.00	63
NATURAL FAIR COVER					
"GRASS"	B	14.70	0.30	1.00	69
NATURAL FAIR COVER					
"OPEN BRUSH"	B	20.00	0.30	1.00	66
COMMERCIAL	B	33.00	0.30	0.10	56
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	15.50	0.30	0.20	56
NATURAL FAIR COVER					
"WOODLAND"	B	7.40	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.78  
SUBAREA AREA(ACRES) = 190.20

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.48;6H= 3.71;24H= 6.52  
S-GRAPH: VALLEY(DEV.)= 2.4%;VALLEY(UNDEV.)/DESERT= 18.7%  
MOUNTAIN= 63.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.03; LAG(HR) = 1.63; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 50136.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0219  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16072.68  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18514.11  
TOTAL AREA(ACRES) = 50136.80 PEAK FLOW RATE(CFS) = 18593.85  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 121.96  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	242.70	0.25	1.00	75
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	1.70	0.25	0.50	69
NATURAL FAIR COVER					
"GRASS"	C	27.20	0.25	1.00	79
URBAN FAIR COVER					
"TURF"	C	12.10	0.25	1.00	77
NATURAL FAIR COVER					
"OPEN BRUSH"	C	172.20	0.25	1.00	77
COMMERCIAL	C	38.30	0.25	0.10	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
SUBAREA AREA(ACRES) = 494.20

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.48;6H= 3.70;24H= 6.50  
S-GRAPH: VALLEY(DEV.)= 2.7%;VALLEY(UNDEV.)/DESERT= 18.6%  
MOUNTAIN= 63.6%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.03; LAG(HR) = 1.63; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 50631.01  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0219  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16146.13  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18598.15  
TOTAL AREA(ACRES) = 50631.01 PEAK FLOW RATE(CFS) = 18598.15

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 121.96  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	C	180.60	0.25	0.20	69
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	21.30	0.25	1.00	81
NATURAL FAIR COVER					
"WOODLAND"	C	48.40	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	160.00	0.20	1.00	81
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	0.80	0.20	0.50	75
NATURAL FAIR COVER					
"GRASS"	D	28.00	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.67  
SUBAREA AREA(ACRES) = 439.10

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.47;6H= 3.69;24H= 6.48  
S-GRAPH: VALLEY(DEV.)= 3.0%;VALLEY(UNDEV.)/DESERT= 18.6%

MOUNTAIN= 63.3%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.03; LAG(HR) = 1.63; Fm(INCH/HR) = 0.23; Ybar = 0.39  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51070.11  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0219  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16239.76  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18701.87  
 TOTAL AREA(ACRES) = 51070.11 PEAK FLOW RATE(CFS) = 18701.87

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 121.96  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN FAIR COVER					
"TURF"	D	0.40	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	171.40	0.20	1.00	83
COMMERCIAL	D	51.30	0.20	0.10	75
PUBLIC PARK	D	7.90	0.20	0.85	75
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	D	154.70	0.20	0.20	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	24.20	0.20	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.58  
 SUBAREA AREA(ACRES) = 409.90  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.47;6H= 3.69;24H= 6.47  
 S-GRAPH: VALLEY(DEV.)= 3.3%;VALLEY(UNDEV.)/DESERT= 18.5%  
 MOUNTAIN= 63.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.03; LAG(HR) = 1.63; Fm(INCH/HR) = 0.23; Ybar = 0.39  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51480.01  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0219  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16339.11  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18809.50  
 TOTAL AREA(ACRES) = 51480.01 PEAK FLOW RATE(CFS) = 18809.50

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 121.96  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/  
LAND USE

SCS SOIL  
GROUP

AREA  
(ACRES)

Fp  
(INCH/HR)

Ap  
(DECIMAL)

SCS  
CN

RESIDENTIAL  
 "3-4 DWELLINGS/ACRE" D 1.30 0.20 0.60 75  
 NATURAL FAIR COVER  
 "WOODLAND" D 53.60 0.20 1.00 79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 54.90  
 UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.47;6H= 3.68;24H= 6.47  
 S-GRAPH: VALLEY(DEV.)= 3.4%;VALLEY(UNDEV.)/DESERT= 18.5%  
 MOUNTAIN= 63.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.03; LAG(HR) = 1.63; Fm(INCH/HR) = 0.23; Ybar = 0.39  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51534.91  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0285; Lca/L=0.4,n=.0255; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0219  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16348.04  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18819.72  
 TOTAL AREA(ACRES) = 51534.91 PEAK FLOW RATE(CFS) = 18819.72

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 END OF STUDY SUMMARY:  
 TOTAL AREA(ACRES) = 51534.91 TC(MIN.) = 121.96  
 AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.39  
 PEAK FLOW RATE(CFS) = 18819.72  
 -----

\*\*\*\*\*  
 END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS  
 -----

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LP65100E.DAT  
TIME/DATE OF STUDY: 08:03 02/26/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	7.600
2)	10.000;	4.500
3)	15.000;	3.500
4)	20.000;	2.750
5)	30.000;	2.100
6)	60.000;	1.520
7)	120.000;	1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.570
FOOTHILL	0.150
MOUNTAIN	0.010
VALLEY(UNDEVELOPED)/DESERT	0.270
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LP64100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18819.72 Tc(MIN.) = 121.96  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.39  
TOTAL AREA(ACRES) = 51534.91  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18819.72 Tc(MIN.) = 121.96  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.39  
TOTAL AREA(ACRES) = 51534.91  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1064.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 275.00 DOWNSTREAM(FEET) = 240.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5738.00 CHANNEL SLOPE = 0.0061  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 18819.72  
FLOW VELOCITY(FEET/SEC.) = 19.52 FLOW DEPTH(FEET) = 11.59  
TRAVEL TIME(MIN.) = 4.90 Tc(MIN.) = 126.86  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 126.86  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.970  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	0.20	0.40	0.50	32
NATURAL FAIR COVER					
"GRASS"	A	11.30	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	49.50	0.40	1.00	49
NATURAL FAIR COVER					
"OPEN BRUSH"	A	0.70	0.40	1.00	46
COMMERCIAL	A	0.90	0.40	0.10	32
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	A	43.50	0.40	0.20	32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.66					
SUBAREA AREA(ACRES) = 106.10					
UNIT-HYDROGRAPH DATA:					
RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.47;6H= 3.68;24H= 6.46					

S-GRAPH: VALLEY(DEV.)= 3.5%;VALLEY(UNDEV.)/DESERT= 18.5%  
MOUNTAIN= 62.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51641.01  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16356.43  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18613.12  
TOTAL AREA(ACRES) = 51641.01 PEAK FLOW RATE(CFS) = 18819.72  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 126.86  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	A	6.90	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	B	6.70	0.30	1.00	63
NATURAL POOR COVER					
"BARREN"	B	0.70	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	36.10	0.30	1.00	69
URBAN FAIR COVER					
"TURF"	B	0.40	0.30	1.00	65
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	B	1.80	0.30	1.00	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 52.60  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.47;6H= 3.68;24H= 6.46  
S-GRAPH: VALLEY(DEV.)= 3.5%;VALLEY(UNDEV.)/DESERT= 18.5%  
MOUNTAIN= 62.8%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51693.61  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16359.41  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18618.29  
TOTAL AREA(ACRES) = 51693.61 PEAK FLOW RATE(CFS) = 18819.72  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 126.86  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	B	30.50	0.30	1.00	66
COMMERCIAL	B	3.90	0.30	0.10	56
PUBLIC PARK	B	0.20	0.30	0.85	56
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	60.30	0.30	0.20	56
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	B	82.10	0.30	0.60	56
NATURAL FAIR COVER					
"WOODLAND"	B	44.60	0.30	1.00	60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.62  
SUBAREA AREA(ACRES) = 221.60  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.46;6H= 3.68;24H= 6.45  
S-GRAPH: VALLEY(DEV.)= 3.7%;VALLEY(UNDEV.)/DESERT= 18.6%  
MOUNTAIN= 62.6%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 51915.21  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16391.21  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18660.68  
TOTAL AREA(ACRES) = 51915.21 PEAK FLOW RATE(CFS) = 18819.72  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 126.86  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	111.40	0.25	1.00	75
NATURAL FAIR COVER					
"GRASS"	C	42.10	0.25	1.00	79
URBAN FAIR COVER					
"TURF"	C	0.50	0.25	1.00	77
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	C	0.20	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	117.70	0.25	1.00	77
COMMERCIAL	C	4.20	0.25	0.10	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
SUBAREA AREA(ACRES) = 276.10  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.51;30M= 0.95;1H= 1.32;3H= 2.46;6H= 3.67;24H= 6.44  
S-GRAPH: VALLEY(DEV.)= 4.0%;VALLEY(UNDEV.)/DESERT= 18.6%



MOUNTAIN= 62.3%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.39  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52191.31  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16429.73  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18707.47  
TOTAL AREA(ACRES) = 52191.31 PEAK FLOW RATE(CFS) = 18819.72  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 126.86

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	C	93.00	0.25	0.20	69
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	C	529.20	0.25	0.60	69
NATURAL FAIR COVER					
"WOODLAND"	C	106.50	0.25	1.00	73
PUBLIC PARK	D	1.80	0.20	0.85	75
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	1.90	0.20	1.00	81
NATURAL POOR COVER					
"BARREN"	D	0.70	0.20	1.00	93

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.61

SUBAREA AREA(ACRES) = 733.10

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.50;30M= 0.95;1H= 1.31;3H= 2.45;6H= 3.66;24H= 6.41  
S-GRAPH: VALLEY(DEV.)= 4.8%;VALLEY(UNDEV.)/DESERT= 18.7%

MOUNTAIN= 61.4%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.40

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;

3HR = 0.77; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 52924.41

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16567.43

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18875.23

TOTAL AREA(ACRES) = 52924.41 PEAK FLOW RATE(CFS) = 18875.23

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 126.86

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"GRASS"	D	39.60	0.20	1.00	84
URBAN FAIR COVER					
"TURF"	D	3.30	0.20	1.00	82
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	11.70	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	55.00	0.20	1.00	83
COMMERCIAL	D	0.40	0.20	0.10	75
NATURAL GOOD COVER					
"MEADOWS"	D	2.00	0.20	1.00	78

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00

SUBAREA AREA(ACRES) = 112.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.50;30M= 0.95;1H= 1.31;3H= 2.45;6H= 3.66;24H= 6.41

S-GRAPH: VALLEY(DEV.)= 4.9%;VALLEY(UNDEV.)/DESERT= 18.7%

MOUNTAIN= 61.3%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.40

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;

3HR = 0.77; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53036.41

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16589.19

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18900.59

TOTAL AREA(ACRES) = 53036.41 PEAK FLOW RATE(CFS) = 18900.59

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1064.00 TO NODE 1065.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 126.86

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	D	68.90	0.20	0.20	75
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	D	109.80	0.20	0.60	75
NATURAL FAIR COVER					
"WOODLAND"	D	31.70	0.20	1.00	79
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20					
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.53					
SUBAREA AREA(ACRES) = 210.40					

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.50;30M= 0.95;1H= 1.31;3H= 2.45;6H= 3.65;24H= 6.40

S-GRAPH: VALLEY(DEV.)= 5.1%;VALLEY(UNDEV.)/DESERT= 18.8%

MOUNTAIN= 61.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.11; LAG(HR) = 1.69; Fm(INCH/HR) = 0.23; Ybar = 0.40

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;

3HR = 0.77; 6HR = 0.90; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53246.81

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0282; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0232;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16638.38  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18959.34  
TOTAL AREA(ACRES) = 53246.81 PEAK FLOW RATE(CFS) = 18959.34

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 53246.81 TC(MIN.) = 126.86  
AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.40  
PEAK FLOW RATE(CFS) = 18959.34

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LP66100E.DAT  
TIME/DATE OF STUDY: 08:03 02/26/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.240  
FOOTHILL 0.080  
MOUNTAIN 0.680  
VALLEY(UNDEVELOPED)/DESERT 0.000  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LP65100E.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18959.34 Tc(MIN.) = 126.86  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.40  
TOTAL AREA(ACRES) = 53246.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 14.0  
-----  
>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 18959.34 Tc(MIN.) = 126.86  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.40  
TOTAL AREA(ACRES) = 53246.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 240.00 DOWNSTREAM(FEET) = 213.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6295.00 CHANNEL SLOPE = 0.0043  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 18959.34  
FLOW VELOCITY(FEET/SEC.) = 14.49 FLOW DEPTH(FEET) = 12.01  
TRAVEL TIME(MIN.) = 7.24 Tc(MIN.) = 134.10  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 134.10  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.940  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	A	19.80	0.40	0.85	32
AGRICULTURAL POOR COVER					
"FALLOW"	A	2.20	0.40	1.00	77
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	13.30	0.40	0.50	32
NATURAL POOR COVER					
"BARREN"	A	56.00	0.40	1.00	78
NATURAL FAIR COVER					
"GRASS"	A	51.40	0.40	1.00	50
URBAN FAIR COVER					
"TURF"	A	20.20	0.40	1.00	44

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
SUBAREA AREA(ACRES) = 162.90  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.50;30M= 0.95;1H= 1.31;3H= 2.45;6H= 3.65;24H= 6.40

S-GRAPH: VALLEY(DEV.)= 5.1%;VALLEY(UNDEV.)/DESERT= 18.7%  
MOUNTAIN= 61.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.23; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.40  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53409.71  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16643.94  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18600.23  
TOTAL AREA(ACRES) = 53409.71 PEAK FLOW RATE(CFS) = 18959.34  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 134.10

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	120.00	0.40	1.00	49
NATURAL FAIR COVER					
"OPEN BRUSH"	A	4.00	0.40	1.00	46
COMMERCIAL	A	17.30	0.40	0.10	32
NATURAL GOOD COVER					
"MEADOWS"	A	0.40	0.40	1.00	30
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	A	7.10	0.40	0.20	32
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	1.30	0.40	1.00	40

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.86  
SUBAREA AREA(ACRES) = 150.10

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.50;30M= 0.95;1H= 1.31;3H= 2.45;6H= 3.65;24H= 6.39  
S-GRAPH: VALLEY(DEV.)= 5.2%;VALLEY(UNDEV.)/DESERT= 18.7%

MOUNTAIN= 61.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.23; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.40  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53559.81

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16646.21  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18605.21  
TOTAL AREA(ACRES) = 53559.81 PEAK FLOW RATE(CFS) = 18959.34

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

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MAINLINE Tc(MIN) = 134.10  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	A	101.40	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	119.30	0.30	1.00	63
AGRICULTURAL POOR COVER					
"FALLOW"	B	19.80	0.30	1.00	86
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	201.90	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	189.50	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	335.80	0.30	1.00	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
SUBAREA AREA(ACRES) = 967.70

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.50;30M= 0.94;1H= 1.31;3H= 2.44;6H= 3.63;24H= 6.36  
S-GRAPH: VALLEY(DEV.)= 5.5%;VALLEY(UNDEV.)/DESERT= 18.3%

MOUNTAIN= 61.2%;FOOTHILL= 14.9%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.23; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.40  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 54527.51

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16748.97  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18710.91  
TOTAL AREA(ACRES) = 54527.51 PEAK FLOW RATE(CFS) = 18959.34

NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 134.10

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN FAIR COVER					
"TURF"	B	139.20	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	113.30	0.30	1.00	66
COMMERCIAL	B	352.90	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	174.00	0.30	1.00	69
PUBLIC PARK	B	22.20	0.30	0.85	56
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	85.90	0.30	0.20	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.56  
SUBAREA AREA(ACRES) = 887.50

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.50;30M= 0.94;1H= 1.31;3H= 2.43;6H= 3.62;24H= 6.33

S-GRAPH: VALLEY(DEV.)= 5.8%;VALLEY(UNDEV.)/DESERT= 18.0%

MOUNTAIN= 61.3%;FOOTHILL= 14.8%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.23; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.40  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.32; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 55415.01  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 16910.61  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 18877.83  
TOTAL AREA(ACRES) = 55415.01 PEAK FLOW RATE(CFS) = 18959.34  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<

-----  
MAINLINE Tc(MIN) = 134.10

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	B	2.40	0.30	1.00	72
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	B	76.70	0.30	0.60	56
NATURAL FAIR COVER					
"WOODLAND"	B	223.60	0.30	1.00	60
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	C	252.20	0.25	1.00	75
AGRICULTURAL POOR COVER					
"FALLOW"	C	67.20	0.25	1.00	91
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	322.30	0.25	0.50	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.80  
SUBAREA AREA(ACRES) = 944.40

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.50;30M= 0.94;1H= 1.30;3H= 2.42;6H= 3.60;24H= 6.30  
S-GRAPH: VALLEY(DEV.)= 6.1%;VALLEY(UNDEV.)/DESERT= 17.7%  
MOUNTAIN= 61.4%;FOOTHILL= 14.7%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.23; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.40  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.32; 30M = 0.38; 1HR = 0.42;  
3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 56359.41  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 17047.10  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19018.66  
TOTAL AREA(ACRES) = 56359.41 PEAK FLOW RATE(CFS) = 19018.66

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<

-----  
MAINLINE Tc(MIN) = 134.10

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER					
"BARREN"	C	117.80	0.25	1.00	91
NATURAL FAIR COVER					
"GRASS"	C	615.70	0.25	1.00	79
URBAN FAIR COVER					
"TURF"	C	52.40	0.25	1.00	77
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	C	183.90	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	1315.50	0.25	1.00	77
COMMERCIAL	C	417.30	0.25	0.10	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.86

SUBAREA AREA(ACRES) = 2702.60  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.30;3H= 2.40;6H= 3.56;24H= 6.21

S-GRAPH: VALLEY(DEV.)= 6.9%;VALLEY(UNDEV.)/DESERT= 16.9%  
MOUNTAIN= 61.7%;FOOTHILL= 14.4%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.23; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.41

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.37; 1HR = 0.41;  
3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 59062.01  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 17528.00  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19480.55  
TOTAL AREA(ACRES) = 59062.01 PEAK FLOW RATE(CFS) = 19480.55

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<<

-----  
MAINLINE Tc(MIN) = 134.10

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	C	0.70	0.25	0.85	69
NATURAL GOOD COVER					
"MEADOWS"	C	4.00	0.25	1.00	71
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	C	460.80	0.25	0.20	69
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	C	26.10	0.25	1.00	81
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	C	228.40	0.25	0.60	69
NATURAL FAIR COVER					
"WOODLAND"	C	211.80	0.25	1.00	73

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.51

SUBAREA AREA(ACRES) = 931.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.29;3H= 2.39;6H= 3.55;24H= 6.19

S-GRAPH: VALLEY(DEV.)= 7.2%;VALLEY(UNDEV.)/DESERT= 16.7%  
MOUNTAIN= 61.8%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.23; LAG(HR) = 1.79; Fm(INCH/HR) = 0.23; Ybar = 0.40

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.37; 1HR = 0.41;  
3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 59993.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 17734.45  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19689.89  
TOTAL AREA(ACRES) = 59993.81 PEAK FLOW RATE(CFS) = 19689.89

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 134.10

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	112.90	0.20	1.00	81
PUBLIC PARK	D	44.50	0.20	0.85	75
AGRICULTURAL POOR COVER					
"FALLOW"	D	12.50	0.20	1.00	94
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	91.50	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	9.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	204.00	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.89

SUBAREA AREA(ACRES) = 475.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.29;3H= 2.39;6H= 3.54;24H= 6.17

S-GRAPH: VALLEY(DEV.)= 7.3%;VALLEY(UNDEV.)/DESERT= 16.5%

MOUNTAIN= 61.9%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.23; LAG(HR) = 1.79; Fm(INCH/HR) = 0.22; Ybar = 0.40

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;

3HR = 0.76; 6HR = 0.89; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 60468.81

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 17830.63

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19783.23

TOTAL AREA(ACRES) = 60468.81 PEAK FLOW RATE(CFS) = 19783.23

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
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>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 134.10

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL	AREA	Fp	Ap	SCS
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LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	0.40	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	5.80	0.20	1.00	82
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	95.90	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	171.90	0.20	1.00	83
COMMERCIAL	D	35.50	0.20	0.10	75
NATURAL GOOD COVER					
"MEADOWS"	D	1.60	0.20	1.00	78

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90

SUBAREA AREA(ACRES) = 311.10

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.29;3H= 2.39;6H= 3.54;24H= 6.17

S-GRAPH: VALLEY(DEV.)= 7.4%;VALLEY(UNDEV.)/DESERT= 16.5%

MOUNTAIN= 61.9%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.23; LAG(HR) = 1.79; Fm(INCH/HR) = 0.22; Ybar = 0.40

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;

3HR = 0.75; 6HR = 0.89; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 60779.91

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 17895.36

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19845.16

TOTAL AREA(ACRES) = 60779.91 PEAK FLOW RATE(CFS) = 19845.16

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

-----  
MAINLINE Tc(MIN) = 134.10

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	D	357.30	0.20	0.20	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	11.30	0.20	1.00	86
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	D	309.70	0.20	0.60	75
NATURAL FAIR COVER					
"WOODLAND"	D	41.70	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.43

SUBAREA AREA(ACRES) = 720.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.29;3H= 2.38;6H= 3.53;24H= 6.15

S-GRAPH: VALLEY(DEV.)= 7.6%;VALLEY(UNDEV.)/DESERT= 16.3%

MOUNTAIN= 62.0%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.23; LAG(HR) = 1.79; Fm(INCH/HR) = 0.22; Ybar = 0.40

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;

3HR = 0.75; 6HR = 0.89; 24HR= 0.94

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 61499.91

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0284; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0234;Lca/L=0.6,n=.0218

TIME OF PEAK FLOW(HR) = 17.75    RUNOFF VOLUME(AF) =    18076.90  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20027.53  
TOTAL AREA(ACRES) = 61499.91        PEAK FLOW RATE(CFS) =    20027.53

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES)        = 61499.91    TC(MIN.) =        134.10

AREA-AVERAGED Fm(INCH/HR) = 0.22    Ybar = 0.40

PEAK FLOW RATE(CFS)     = 20027.53

=====

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LP67100E.DAT  
TIME/DATE OF STUDY: 08:03 02/26/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
-----  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.160  
FOOTHILL 0.140  
MOUNTAIN 0.620  
VALLEY(UNDEVELOPED)/DESERT 0.080  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE	TABLE FILE NAME	LP66100E.DNA
MEMORY BANK # 1	DEFINED AS FOLLOWS:	
PEAK FLOW RATE(CFS)	=	20027.53 Tc(MIN.) = 134.10
AREA-AVERAGED Fm(INCH/HR)	=	0.22 Ybar = 0.40
TOTAL AREA(ACRES)	=	61499.91
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE	1066.00 = ***** FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 20027.53 Tc(MIN.) = 134.10  
AREA-AVERAGED Fm(INCH/HR) = 0.22 Ybar = 0.40  
TOTAL AREA(ACRES) = 61499.91  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 213.00 DOWNSTREAM(FEET) = 176.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6201.00 CHANNEL SLOPE = 0.0060  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 20027.53  
FLOW VELOCITY(FEET/SEC.) = 16.51 FLOW DEPTH(FEET) = 11.28  
TRAVEL TIME(MIN.) = 6.26 Tc(MIN.) = 140.36  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 140.36  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.915  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER					
"FALLOW"	A	0.20	0.40	1.00	77
NATURAL FAIR COVER					
"GRASS"	A	0.90	0.40	1.00	50
NATURAL FAIR COVER					
"OPEN BRUSH"	A	8.90	0.40	1.00	46
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	5.50	0.40	1.00	49
NATURAL FAIR COVER					
"WOODLAND"	A	17.90	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	23.90	0.30	1.00	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.36  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 57.30  
UNIT-HYDROGRAPH DATA:



RAINFALL(INCH): 5M= 0.49;30M= 0.94;1H= 1.29;3H= 2.38;6H= 3.53;24H= 6.15  
S-GRAPH: VALLEY(DEV.)= 7.6%;VALLEY(UNDEV.)/DESERT= 16.3%  
MOUNTAIN= 62.0%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.22; Ybar = 0.40  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 61557.22  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18076.47  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19878.29  
TOTAL AREA(ACRES) = 61557.22 PEAK FLOW RATE(CFS) = 20027.53  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
MAINLINE Tc(MIN) = 140.36  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
AGRICULTURAL POOR COVER  
"FALLOW" B 180.40 0.30 1.00 86  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" B 89.60 0.30 0.50 56  
NATURAL FAIR COVER  
"GRASS" B 327.50 0.30 1.00 69  
AGRICULTURAL FAIR COVER  
"ORCHARDS" B 6.00 0.30 1.00 65  
URBAN FAIR COVER  
"TURF" B 105.00 0.30 1.00 65  
NATURAL FAIR COVER  
"OPEN BRUSH" B 118.90 0.30 1.00 66  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
SUBAREA AREA(ACRES) = 827.40  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.49;30M= 0.93;1H= 1.29;3H= 2.38;6H= 3.51;24H= 6.12  
S-GRAPH: VALLEY(DEV.)= 7.7%;VALLEY(UNDEV.)/DESERT= 16.1%  
MOUNTAIN= 62.0%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.22; Ybar = 0.41  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.41;  
3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 62384.62  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18172.97  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 19970.45  
TOTAL AREA(ACRES) = 62384.62 PEAK FLOW RATE(CFS) = 20027.53  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
MAINLINE Tc(MIN) = 140.36  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
COMMERCIAL B 7.80 0.30 0.10 56  
AGRICULTURAL FAIR COVER  
"PASTURE, DRYLAND" B 418.80 0.30 1.00 69  
NATURAL GOOD COVER  
"MEADOWS" B 0.90 0.30 1.00 58  
NATURAL FAIR COVER  
"CHAPARRAL, NARROWLEAF" B 0.40 0.30 1.00 72  
RESIDENTIAL  
"3-4 DWELLINGS/ACRE" B 50.90 0.30 0.60 56  
NATURAL FAIR COVER  
"WOODLAND" B 51.70 0.30 1.00 60  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
SUBAREA AREA(ACRES) = 530.50  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.49;30M= 0.93;1H= 1.29;3H= 2.37;6H= 3.51;24H= 6.11  
S-GRAPH: VALLEY(DEV.)= 7.8%;VALLEY(UNDEV.)/DESERT= 16.1%  
MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.22; Ybar = 0.41  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.40;  
3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 62915.12  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18222.37  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20020.69  
TOTAL AREA(ACRES) = 62915.12 PEAK FLOW RATE(CFS) = 20027.53  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
MAINLINE Tc(MIN) = 140.36  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL, BROADLEAF" C 203.60 0.25 1.00 75  
AGRICULTURAL POOR COVER  
"FALLOW" C 124.30 0.25 1.00 91  
NATURAL POOR COVER  
"BARREN" C 7.60 0.25 1.00 91  
NATURAL FAIR COVER  
"GRASS" C 485.30 0.25 1.00 79  
AGRICULTURAL FAIR COVER  
"ORCHARDS" C 0.70 0.25 1.00 77  
URBAN FAIR COVER  
"TURF" C 4.90 0.25 1.00 77  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 826.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.49;30M= 0.93;1H= 1.29;3H= 2.37;6H= 3.50;24H= 6.09  
 S-GRAPH: VALLEY(DEV.)= 7.9%;VALLEY(UNDEV.)/DESERT= 16.0%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.22; Ybar = 0.41  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.40;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 63741.52  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18357.87  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20144.37  
 TOTAL AREA(ACRES) = 63741.52 PEAK FLOW RATE(CFS) = 20144.37

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 140.36  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	C	940.00	0.25	1.00	77
COMMERCIAL	C	10.80	0.25	0.10	69
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	C	128.10	0.25	1.00	79
NATURAL GOOD COVER					
"MEADOWS"	C	0.20	0.25	1.00	71
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	C	17.90	0.25	0.20	69
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	C	125.40	0.25	0.60	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
 SUBAREA AREA(ACRES) = 1222.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.49;30M= 0.93;1H= 1.28;3H= 2.36;6H= 3.48;24H= 6.06  
 S-GRAPH: VALLEY(DEV.)= 8.1%;VALLEY(UNDEV.)/DESERT= 15.8%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.22; Ybar = 0.41  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 64963.91  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18541.79  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20321.74  
 TOTAL AREA(ACRES) = 64963.91 PEAK FLOW RATE(CFS) = 20321.74

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 140.36  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	C	94.10	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	D	159.90	0.20	1.00	81
AGRICULTURAL POOR COVER					
"FALLOW"	D	77.90	0.20	1.00	94
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	104.60	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	0.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	635.30	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
 SUBAREA AREA(ACRES) = 1072.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.35;6H= 3.47;24H= 6.03  
 S-GRAPH: VALLEY(DEV.)= 8.2%;VALLEY(UNDEV.)/DESERT= 15.7%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.22; Ybar = 0.41  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66036.31  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218  
 TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18746.98  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20516.68  
 TOTAL AREA(ACRES) = 66036.31 PEAK FLOW RATE(CFS) = 20516.68

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 140.36  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	0.90	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	8.20	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	334.50	0.20	1.00	83
COMMERCIAL	D	11.70	0.20	0.10	75
PUBLIC PARK	D	0.10	0.20	0.85	75
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	D	3.80	0.20	0.20	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.96  
 SUBAREA AREA(ACRES) = 359.20

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.35;6H= 3.47;24H= 6.02  
 S-GRAPH: VALLEY(DEV.)= 8.2%;VALLEY(UNDEV.)/DESERT= 15.7%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.22; Ybar = 0.41  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66395.52  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18815.22  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20581.50  
TOTAL AREA(ACRES) = 66395.52 PEAK FLOW RATE(CFS) = 20581.50

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*

FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 140.36

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	7.80	0.20	1.00	86
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	61.40	0.20	1.00	84
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	D	156.10	0.20	0.60	75
NATURAL FAIR COVER					
"WOODLAND"	D	63.80	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.78

SUBAREA AREA(ACRES) = 289.10

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.35;6H= 3.46;24H= 6.02

S-GRAPH: VALLEY(DEV.)= 8.3%;VALLEY(UNDEV.)/DESERT= 15.6%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.34; LAG(HR) = 1.87; Fm(INCH/HR) = 0.22; Ybar = 0.41

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;

3HR = 0.74; 6HR = 0.89; 24HR= 0.93

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66684.62

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0254; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0218

TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18871.58

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20637.31

TOTAL AREA(ACRES) = 66684.62 PEAK FLOW RATE(CFS) = 20637.31

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 66684.62 TC(MIN.) = 140.36

AREA-AVERAGED Fm(INCH/HR)= 0.22 Ybar = 0.41

PEAK FLOW RATE(CFS) = 20637.31

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

Huitt - Zollars, Inc.  
430 Exchange, Suite 200  
Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LP68100E.DAT  
TIME/DATE OF STUDY: 08:03 02/26/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 7.600  
2) 10.000; 4.500  
3) 15.000; 3.500  
4) 20.000; 2.750  
5) 30.000; 2.100  
6) 60.000; 1.520  
7) 120.000; 1.200

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.250  
FOOTHILL 0.140  
MOUNTAIN 0.180  
VALLEY(UNDEVELOPED)/DESERT 0.430  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME:	LP67100E.DNA
MEMORY BANK # 1 DEFINED AS FOLLOWS:	
PEAK FLOW RATE(CFS) =	20637.31 Tc(MIN.) = 140.36
AREA-AVERAGED Fm(INCH/HR) =	0.22 Ybar = 0.41
TOTAL AREA(ACRES) =	66684.62
LONGEST FLOWPATH FROM NODE	1000.00 TO NODE 1067.00 = ***** FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 20637.31 Tc(MIN.) = 140.36  
AREA-AVERAGED Fm(INCH/HR) = 0.22 Ybar = 0.41  
TOTAL AREA(ACRES) = 66684.62  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 176.00 DOWNSTREAM(FEET) = 133.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6324.00 CHANNEL SLOPE = 0.0068  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 20637.31  
FLOW VELOCITY(FEET/SEC.) = 17.42 FLOW DEPTH(FEET) = 11.06  
TRAVEL TIME(MIN.) = 6.05 Tc(MIN.) = 146.41  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 146.41  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.894  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	A	1.30	0.40	1.00	40
NATURAL GOOD COVER					
"MEADOWS"	A	0.30	0.40	1.00	30
NATURAL FAIR COVER					
"GRASS"	A	1.80	0.40	1.00	50
AGRICULTURAL FAIR COVER					
"ORCHARDS"	A	0.90	0.40	1.00	44
NATURAL FAIR COVER					
"OPEN BRUSH"	A	3.10	0.40	1.00	46
COMMERCIAL	A	23.30	0.40	0.10	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.32  
SUBAREA AREA(ACRES) = 30.70  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.35;6H= 3.46;24H= 6.02

S-GRAPH: VALLEY(DEV.)= 8.3%;VALLEY(UNDEV.)/DESERT= 15.6%  
MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.22; Ybar = 0.41  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR = 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66715.32  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18877.84  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20439.62  
TOTAL AREA(ACRES) = 66715.32 PEAK FLOW RATE(CFS) = 20637.31  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 146.41  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	1.60	0.40	1.00	49
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	A	6.70	0.40	0.20	32
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	A	33.60	0.40	0.60	32
NATURAL FAIR COVER					
"WOODLAND"	A	19.30	0.40	1.00	36
AGRICULTURAL POOR COVER					
"FALLOW"	B	4.10	0.30	1.00	86
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	16.50	0.30	0.50	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.38  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.67  
SUBAREA AREA(ACRES) = 81.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.35;6H= 3.46;24H= 6.02  
S-GRAPH: VALLEY(DEV.)= 8.3%;VALLEY(UNDEV.)/DESERT= 15.7%  
MOUNTAIN= 61.9%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.22; Ybar = 0.41  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR = 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66797.12  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18884.25  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20448.19  
TOTAL AREA(ACRES) = 66797.12 PEAK FLOW RATE(CFS) = 20637.31  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 146.41  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER					
"BARREN"	B	2.00	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	7.10	0.30	1.00	69
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	0.40	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	0.70	0.30	1.00	66
COMMERCIAL	B	42.80	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	10.70	0.30	1.00	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.40  
SUBAREA AREA(ACRES) = 63.70

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.35;6H= 3.46;24H= 6.01  
S-GRAPH: VALLEY(DEV.)= 8.3%;VALLEY(UNDEV.)/DESERT= 15.7%  
MOUNTAIN= 61.9%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.22; Ybar = 0.41

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR = 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66860.82  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18898.71  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20463.36  
TOTAL AREA(ACRES) = 66860.82 PEAK FLOW RATE(CFS) = 20637.31  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 146.41  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	77.60	0.30	0.20	56
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	B	14.90	0.30	0.60	56
NATURAL FAIR COVER					
"WOODLAND"	B	6.90	0.30	1.00	60
NATURAL FAIR COVER					
"GRASS"	C	218.60	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	70.80	0.25	1.00	77
COMMERCIAL	C	12.90	0.25	0.10	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.80  
SUBAREA AREA(ACRES) = 401.70  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.34;6H= 3.46;24H= 6.00

S-GRAPH: VALLEY(DEV.)= 8.4%;VALLEY(UNDEV.)/DESERT= 15.9%  
MOUNTAIN= 61.6%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.22; Ybar = 0.41  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 67262.52  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 18968.00  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20535.25  
TOTAL AREA(ACRES) = 67262.52 PEAK FLOW RATE(CFS) = 20637.31  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 146.41  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	C	0.20	0.25	0.85	69
RESIDENTIAL "3-4 DWELLINGS/ACRE"	C	0.90	0.25	0.60	69
NATURAL FAIR COVER "WOODLAND"	C	19.50	0.25	1.00	73
AGRICULTURAL POOR COVER "FALLOW"	D	35.60	0.20	1.00	94
RESIDENTIAL "5-7 DWELLINGS/ACRE"	D	140.20	0.20	0.50	75
NATURAL POOR COVER "BARREN"	D	0.60	0.20	1.00	93

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.64  
SUBAREA AREA(ACRES) = 197.00

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.34;6H= 3.45;24H= 6.00  
S-GRAPH: VALLEY(DEV.)= 8.5%;VALLEY(UNDEV.)/DESERT= 15.9%  
MOUNTAIN= 61.5%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.22; Ybar = 0.41  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 67459.52  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 19011.91  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20580.66  
TOTAL AREA(ACRES) = 67459.52 PEAK FLOW RATE(CFS) = 20637.31  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 146.41  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "GRASS"	D	332.20	0.20	1.00	84
AGRICULTURAL FAIR COVER "ORCHARDS"	D	1.10	0.20	1.00	82
URBAN FAIR COVER "TURF"	D	1.20	0.20	1.00	82
NATURAL FAIR COVER "OPEN BRUSH"	D	172.80	0.20	1.00	83
COMMERCIAL AGRICULTURAL FAIR COVER "PASTURE,DRYLAND"	D	60.20	0.20	0.10	75
	D	1.80	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
SUBAREA AREA(ACRES) = 569.30

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.34;6H= 3.45;24H= 5.99  
S-GRAPH: VALLEY(DEV.)= 8.6%;VALLEY(UNDEV.)/DESERT= 16.2%  
MOUNTAIN= 61.1%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.22; Ybar = 0.41  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 68028.82  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 19126.12  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20695.98  
TOTAL AREA(ACRES) = 68028.82 PEAK FLOW RATE(CFS) = 20695.98

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 146.41  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.200  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "11+ DWELLINGS/ACRE"	D	143.90	0.20	0.20	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	4.90	0.20	1.00	81
RESIDENTIAL "3-4 DWELLINGS/ACRE"	D	6.00	0.20	0.60	75
NATURAL FAIR COVER "WOODLAND"	D	61.30	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.46  
SUBAREA AREA(ACRES) = 216.10

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.48;30M= 0.93;1H= 1.28;3H= 2.34;6H= 3.45;24H= 5.98  
S-GRAPH: VALLEY(DEV.)= 8.7%;VALLEY(UNDEV.)/DESERT= 16.2%  
MOUNTAIN= 61.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.44; LAG(HR) = 1.95; Fm(INCH/HR) = 0.22; Ybar = 0.41  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;

3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 68244.92  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0283; Lca/L=0.4,n=.0253; Lca/L=0.5,n=.0233;Lca/L=0.6,n=.0217  
TIME OF PEAK FLOW(HR) = 18.00 RUNOFF VOLUME(AF) = 19178.91  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 20751.00  
TOTAL AREA(ACRES) = 68244.92 PEAK FLOW RATE(CFS) = 20751.00

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.40; 30M = 0.87; 1HR = 1.15; 3HR = 1.94; 6HR = 2.71; 24HR = 4.49

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 68244.92 TC(MIN.) = 146.41  
AREA-AVERAGED Fm(INCH/HR)= 0.22 Ybar = 0.41  
PEAK FLOW RATE(CFS) = 20751.00

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

**PRELIMINARY DRAFT – FOR INTERNAL USE ONLY**

**TECHNICAL APPENDIX I-C  
HYDROLOGIC ANALYSIS  
PROPOSED CONDITION  
100-YEAR HIGH CONFIDENCE**



\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LP63100H.DAT  
TIME/DATE OF STUDY: 08:17 02/26/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
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

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

- 1) 5.000; 10.000
- 2) 10.000; 6.000
- 3) 15.000; 4.500
- 4) 20.000; 3.600
- 5) 30.000; 2.750
- 6) 60.000; 1.950
- 7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.180  
FOOTHILL 0.150  
MOUNTAIN 0.640  
VALLEY(UNDEVELOPED)/DESERT 0.030  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LU62100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 26077.13 Tc(MIN.) = 106.69  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.32  
TOTAL AREA(ACRES) = 46437.31  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 26077.13 Tc(MIN.) = 106.69  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.32  
TOTAL AREA(ACRES) = 46437.31  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1062.00 = 96841.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1062.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 345.00 DOWNSTREAM(FEET) = 319.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 2852.00 CHANNEL SLOPE = 0.0091  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 26077.13  
FLOW VELOCITY(FEET/SEC.) = 24.77 FLOW DEPTH(FEET) = 12.41  
TRAVEL TIME(MIN.) = 1.92 Tc(MIN.) = 108.61  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 108.61  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.060  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 88.70 0.40 1.00 40  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" A 4.40 0.40 0.50 32  
NATURAL FAIR COVER  
"GRASS" A 6.50 0.40 1.00 50  
NATURAL FAIR COVER  
"OPEN BRUSH" A 98.10 0.40 1.00 46  
COMMERCIAL  
RESIDENTIAL  
"3-4 DWELLINGS/ACRE" A 12.90 0.40 0.60 32  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.96  
SUBAREA AREA(ACRES) = 211.90  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.65;30M= 1.22;1H= 1.70;3H= 3.20;6H= 4.78;24H= 8.47

S-GRAPH: VALLEY(DEV.)= 1.1%;VALLEY(UNDEV.)/DESERT= 19.8%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.81; LAG(HR) = 1.45; Fm(INCH/HR) = 0.23; Ybar = 0.33  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.91; 24HR= 0.95  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 46649.21  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0266; Lca/L=0.4,n=.0238; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204  
TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 21698.26  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26012.19  
TOTAL AREA(ACRES) = 46649.21 PEAK FLOW RATE(CFS) = 26077.13  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.55; 30M = 1.12; 1HR = 1.51; 3HR = 2.63; 6HR = 3.72; 24HR = 6.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 108.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.626  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"WOODLAND" A 48.40 0.40 1.00 36  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 7.10 0.30 1.00 63  
NATURAL FAIR COVER  
"GRASS" B 5.60 0.30 1.00 69  
NATURAL FAIR COVER  
"OPEN BRUSH" B 11.60 0.30 1.00 66  
COMMERCIAL B 0.20 0.30 0.10 56  
RESIDENTIAL  
"11+ DWELLINGS/ACRE" B 6.90 0.30 0.20 56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.37  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
SUBAREA AREA(ACRES) = 79.80

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.65;30M= 1.22;1H= 1.70;3H= 3.20;6H= 4.78;24H= 8.46  
S-GRAPH: VALLEY(DEV.)= 1.1%;VALLEY(UNDEV.)/DESERT= 19.7%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.81; LAG(HR) = 1.45; Fm(INCH/HR) = 0.23; Ybar = 0.33  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.36; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.91; 24HR= 0.95  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 46729.02  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0266; Lca/L=0.4,n=.0238; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204  
TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 21704.66  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26024.84  
TOTAL AREA(ACRES) = 46729.02 PEAK FLOW RATE(CFS) = 26077.13  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.55; 30M = 1.12; 1HR = 1.51; 3HR = 2.63; 6HR = 3.72; 24HR = 6.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 108.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.626  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
RESIDENTIAL  
"3-4 DWELLINGS/ACRE" B 4.20 0.30 0.60 56  
NATURAL FAIR COVER  
"WOODLAND" B 19.00 0.30 1.00 60  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 656.10 0.25 1.00 75  
NATURAL POOR COVER  
"BARREN" C 1.80 0.25 1.00 91  
NATURAL FAIR COVER  
"GRASS" C 156.50 0.25 1.00 79  
NATURAL FAIR COVER  
"OPEN BRUSH" C 1039.10 0.25 1.00 77

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 1876.70

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.65;30M= 1.21;1H= 1.69;3H= 3.18;6H= 4.74;24H= 8.38

S-GRAPH: VALLEY(DEV.)= 1.8%;VALLEY(UNDEV.)/DESERT= 19.1%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.81; LAG(HR) = 1.45; Fm(INCH/HR) = 0.23; Ybar = 0.33  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.35; 30M = 0.40; 1HR = 0.44;  
3HR = 0.79; 6HR = 0.91; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 48605.71  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0266; Lca/L=0.4,n=.0238; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204  
TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22204.01  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26550.24  
TOTAL AREA(ACRES) = 48605.71 PEAK FLOW RATE(CFS) = 26550.24

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.55; 30M = 1.12; 1HR = 1.51; 3HR = 2.63; 6HR = 3.72; 24HR = 6.35

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 108.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.626  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
RESIDENTIAL  
"11+ DWELLINGS/ACRE" C 80.90 0.25 0.20 69  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 54.20 0.25 1.00 81  
RESIDENTIAL  
"3-4 DWELLINGS/ACRE" C 28.70 0.25 0.60 69  
NATURAL FAIR COVER  
"WOODLAND" C 189.00 0.25 1.00 73  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 420.90 0.20 1.00 81  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" D 0.60 0.20 0.50 75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
SUBAREA AREA(ACRES) = 774.30

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.69;3H= 3.17;6H= 4.72;24H= 8.35

S-GRAPH: VALLEY(DEV.)= 2.0%;VALLEY(UNDEV.)/DESERT= 18.8%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.81; LAG(HR) = 1.45; Fm(INCH/HR) = 0.23; Ybar = 0.33

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.35; 30M = 0.40; 1HR = 0.44;  
 3HR = 0.79; 6HR = 0.90; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 49380.01  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0266; Lca/L=0.4,n=.0238; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22435.34  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26793.63  
 TOTAL AREA(ACRES) = 49380.01 PEAK FLOW RATE(CFS) = 26793.63

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.55; 30M = 1.12; 1HR = 1.51; 3HR = 2.63; 6HR = 3.72; 24HR = 6.35

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 108.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.626

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER "BARREN"	D	0.10	0.20	1.00	93
NATURAL FAIR COVER "GRASS"	D	48.30	0.20	1.00	84
NATURAL FAIR COVER "OPEN BRUSH"	D	261.40	0.20	1.00	83
RESIDENTIAL "1+ DWELLINGS/ACRE"	D	1.90	0.20	0.20	75
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	139.40	0.20	1.00	86
RESIDENTIAL "3-4 DWELLINGS/ACRE"	D	16.70	0.20	0.60	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.98

SUBAREA AREA(ACRES) = 467.80

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.17;6H= 4.71;24H= 8.33

S-GRAPH: VALLEY(DEV.)= 2.2%;VALLEY(UNDEV.)/DESERT= 18.7%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.81; LAG(HR) = 1.45; Fm(INCH/HR) = 0.23; Ybar = 0.33

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;

3HR = 0.78; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 49847.81

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0266; Lca/L=0.4,n=.0238; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204

TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22587.61

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26945.47

TOTAL AREA(ACRES) = 49847.81 PEAK FLOW RATE(CFS) = 26945.47

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.55; 30M = 1.12; 1HR = 1.51; 3HR = 2.63; 6HR = 3.72; 24HR = 6.35

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1062.00 TO NODE 1063.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

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MAINLINE Tc(MIN) = 108.61

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.626

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
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NATURAL FAIR COVER  
 "WOODLAND" D 40.00 0.20 1.00 79  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
 SUBAREA AREA(ACRES) = 40.00

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.16;6H= 4.71;24H= 8.33

S-GRAPH: VALLEY(DEV.)= 2.2%;VALLEY(UNDEV.)/DESERT= 18.7%

MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.81; LAG(HR) = 1.45; Fm(INCH/HR) = 0.23; Ybar = 0.33

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;

3HR = 0.78; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 49887.81

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0266; Lca/L=0.4,n=.0238; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0204

TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22599.14

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26957.67

TOTAL AREA(ACRES) = 49887.81 PEAK FLOW RATE(CFS) = 26957.67

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.55; 30M = 1.12; 1HR = 1.51; 3HR = 2.63; 6HR = 3.72; 24HR = 6.35

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 49887.81 TC(MIN.) = 108.61

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.33

PEAK FLOW RATE(CFS) = 26957.67

=====

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LP64100H.DAT  
TIME/DATE OF STUDY: 08:17 02/26/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.390  
FOOTHILL 0.150  
MOUNTAIN 0.330  
VALLEY(UNDEVELOPED)/DESERT 0.130  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LP63100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 26957.67 Tc(MIN.) = 108.61  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 49887.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 26957.67 Tc(MIN.) = 108.61  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 49887.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1063.00 = 99693.00 FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1063.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 319.00 DOWNSTREAM(FEET) = 275.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 5418.00 CHANNEL SLOPE = 0.0081  
CHANNEL BASE(FEET) = 60.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.025 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 26957.67  
FLOW VELOCITY(FEET/SEC.) = 24.01 FLOW DEPTH(FEET) = 13.04  
TRAVEL TIME(MIN.) = 3.76 Tc(MIN.) = 112.37  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 112.37  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.040  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" A 51.80 0.40 1.00 40  
NATURAL FAIR COVER  
"GRASS" A 0.20 0.40 1.00 50  
AGRICULTURAL FAIR COVER  
"ORCHARDS" A 0.20 0.40 1.00 44  
COMMERCIAL A 0.20 0.40 0.10 32  
RESIDENTIAL  
"11+ DWELLINGS/ACRE" A 4.80 0.40 0.20 32  
NATURAL FAIR COVER  
"WOODLAND" A 1.60 0.40 1.00 36  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
SUBAREA AREA(ACRES) = 58.80  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.16;6H= 4.71;24H= 8.33

S-GRAPH: VALLEY(DEV.)= 2.2%;VALLEY(UNDEV.)/DESERT= 18.7%  
MOUNTAIN= 64.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.87; LAG(HR) = 1.50; Fm(INCH/HR) = 0.23; Ybar = 0.33  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 49946.61  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202  
TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22597.70  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26668.45  
TOTAL AREA(ACRES) = 49946.61 PEAK FLOW RATE(CFS) = 26957.67  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 112.37  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.601  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" B 99.60 0.30 1.00 63  
NATURAL FAIR COVER  
"GRASS" B 14.70 0.30 1.00 69  
NATURAL FAIR COVER  
"OPEN BRUSH" B 20.00 0.30 1.00 66  
COMMERCIAL B 33.00 0.30 0.10 56  
RESIDENTIAL  
"11+ DWELLINGS/ACRE" B 15.50 0.30 0.20 56  
NATURAL FAIR COVER  
"WOODLAND" B 7.40 0.30 1.00 60

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.78  
SUBAREA AREA(ACRES) = 190.20

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.16;6H= 4.71;24H= 8.32  
S-GRAPH: VALLEY(DEV.)= 2.4%;VALLEY(UNDEV.)/DESERT= 18.7%  
MOUNTAIN= 63.9%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.87; LAG(HR) = 1.50; Fm(INCH/HR) = 0.23; Ybar = 0.33  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 50136.80  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202  
TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22631.51  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26713.37  
TOTAL AREA(ACRES) = 50136.80 PEAK FLOW RATE(CFS) = 26957.67  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 112.37

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.601  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" C 242.70 0.25 1.00 75  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" C 1.70 0.25 0.50 69  
NATURAL FAIR COVER  
"GRASS" C 27.20 0.25 1.00 79  
URBAN FAIR COVER  
"TURF" C 12.10 0.25 1.00 77  
NATURAL FAIR COVER  
"OPEN BRUSH" C 172.20 0.25 1.00 77  
COMMERCIAL C 38.30 0.25 0.10 69  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.93  
SUBAREA AREA(ACRES) = 494.20

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.15;6H= 4.69;24H= 8.29

S-GRAPH: VALLEY(DEV.)= 2.7%;VALLEY(UNDEV.)/DESERT= 18.6%  
MOUNTAIN= 63.6%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.87; LAG(HR) = 1.50; Fm(INCH/HR) = 0.23; Ybar = 0.33  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 50631.01  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202  
TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22740.43  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26839.24  
TOTAL AREA(ACRES) = 50631.01 PEAK FLOW RATE(CFS) = 26957.67  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 112.37  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.601  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
RESIDENTIAL  
"11+ DWELLINGS/ACRE" C 180.60 0.25 0.20 69  
NATURAL FAIR COVER  
"CHAPARRAL,NARROWLEAF" C 21.30 0.25 1.00 81  
NATURAL FAIR COVER  
"WOODLAND" C 48.40 0.25 1.00 73  
NATURAL FAIR COVER  
"CHAPARRAL,BROADLEAF" D 160.00 0.20 1.00 81  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" D 0.80 0.20 0.50 75  
NATURAL FAIR COVER  
"GRASS" D 28.00 0.20 1.00 84  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.67  
SUBAREA AREA(ACRES) = 439.10

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.15;6H= 4.68;24H= 8.27  
S-GRAPH: VALLEY(DEV.)= 3.0%;VALLEY(UNDEV.)/DESERT= 18.6%  
MOUNTAIN= 63.3%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 1.87; LAG(HR) = 1.50; Fm(INCH/HR) = 0.23; Ybar = 0.33

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;  
 3HR = 0.78; 6HR = 0.90; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 51070.11  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202  
 TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22867.31  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26980.83  
 TOTAL AREA(ACRES) = 51070.11 PEAK FLOW RATE(CFS) = 26980.83

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 112.37

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.601

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN FAIR COVER "TURF"	D	0.40	0.20	1.00	82
NATURAL FAIR COVER "OPEN BRUSH"	D	171.40	0.20	1.00	83
COMMERCIAL	D	51.30	0.20	0.10	75
PUBLIC PARK	D	7.90	0.20	0.85	75
RESIDENTIAL "11+ DWELLINGS/ACRE"	D	154.70	0.20	0.20	75
NATURAL FAIR COVER "CHAPARRAL,NARROWLEAF"	D	24.20	0.20	1.00	86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.58

SUBAREA AREA(ACRES) = 409.90

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.14;6H= 4.67;24H= 8.25

S-GRAPH: VALLEY(DEV.)= 3.3%;VALLEY(UNDEV.)/DESERT= 18.5%

MOUNTAIN= 63.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.87; LAG(HR) = 1.50; Fm(INCH/HR) = 0.23; Ybar = 0.33

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;

3HR = 0.78; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 51480.01

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202

TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 22998.54

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 27123.48

TOTAL AREA(ACRES) = 51480.01 PEAK FLOW RATE(CFS) = 27123.48

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1063.00 TO NODE 1064.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 112.37

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.601

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "3-4 DWELLINGS/ACRE"	D	1.30	0.20	0.60	75

NATURAL FAIR COVER  
 "WOODLAND" D 53.60 0.20 1.00 79  
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.99  
 SUBAREA AREA(ACRES) = 54.90

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.64;30M= 1.21;1H= 1.68;3H= 3.14;6H= 4.67;24H= 8.24

S-GRAPH: VALLEY(DEV.)= 3.4%;VALLEY(UNDEV.)/DESERT= 18.5%

MOUNTAIN= 63.0%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 1.87; LAG(HR) = 1.50; Fm(INCH/HR) = 0.23; Ybar = 0.33

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.34; 30M = 0.39; 1HR = 0.43;

3HR = 0.78; 6HR = 0.90; 24HR = 0.94

UNIT-INTERVAL(MIN) = 10.00 TOTAL AREA(ACRES) = 51534.91

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1064.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202

TIME OF PEAK FLOW(HR) = 17.50 RUNOFF VOLUME(AF) = 23011.52

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 27138.42

TOTAL AREA(ACRES) = 51534.91 PEAK FLOW RATE(CFS) = 27138.42

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 51534.91 TC(MIN.) = 112.37

AREA-AVERAGED Fm(INCH/HR)= 0.23 Ybar = 0.33

PEAK FLOW RATE(CFS) = 27138.42

=====

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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Irvine, CA. 92602-1309  
714 - 734 - 5100

-----  
FILE NAME: LP66100H.DAT  
TIME/DATE OF STUDY: 08:17 02/26/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7  
1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

NO.	WIDTH (FT)	CROSSFALL (FT)	IN- / SIDE	OUT- / SIDE/ WAY	HEIGHT (FT)	WIDTH (FT)	LIP (FT)	HIKE (FT)	FACTOR (n)
1	30.0	20.0	0.018/0.018/0.020		0.67	2.00	0.0312	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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.240  
FOOTHILL 0.080  
MOUNTAIN 0.680  
VALLEY(UNDEVELOPED)/DESERT 0.000  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LP65100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 27138.42 Tc(MIN.) = 116.77  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 53246.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 27138.42 Tc(MIN.) = 116.77  
AREA-AVERAGED Fm(INCH/HR) = 0.23 Ybar = 0.33  
TOTAL AREA(ACRES) = 53246.81  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1065.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1065.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 240.00 DOWNSTREAM(FEET) = 213.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6295.00 CHANNEL SLOPE = 0.0043  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 27138.42  
FLOW VELOCITY(FEET/SEC.) = 16.18 FLOW DEPTH(FEET) = 14.67  
TRAVEL TIME(MIN.) = 6.48 Tc(MIN.) = 123.25  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 123.25  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.986  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS GROUP	SOIL (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	A	19.80	0.40	0.85	32
AGRICULTURAL POOR COVER					
"FALLOW"	A	2.20	0.40	1.00	77
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	A	13.30	0.40	0.50	32
NATURAL POOR COVER					
"BARREN"	A	56.00	0.40	1.00	78
NATURAL FAIR COVER					
"GRASS"	A	51.40	0.40	1.00	50
URBAN FAIR COVER					
"TURF"	A	20.20	0.40	1.00	44

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
SUBAREA AREA(ACRES) = 162.90  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.63;30M= 1.20;1H= 1.67;3H= 3.12;6H= 4.62;24H= 8.15

S-GRAPH: VALLEY(DEV.)= 5.1%;VALLEY(UNDEV.)/DESERT= 18.7%  
 MOUNTAIN= 61.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.33  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53409.71  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23354.72  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26704.30  
 TOTAL AREA(ACRES) = 53409.71 PEAK FLOW RATE(CFS) = 27138.42  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 123.25  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	120.00	0.40	1.00	49
NATURAL FAIR COVER					
"OPEN BRUSH"	A	4.00	0.40	1.00	46
COMMERCIAL	A	17.30	0.40	0.10	32
NATURAL GOOD COVER					
"MEADOWS"	A	0.40	0.40	1.00	30
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	A	7.10	0.40	0.20	32
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	A	1.30	0.40	1.00	40

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.86  
 SUBAREA AREA(ACRES) = 150.10

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.63;30M= 1.20;1H= 1.67;3H= 3.11;6H= 4.62;24H= 8.14  
 S-GRAPH: VALLEY(DEV.)= 5.2%;VALLEY(UNDEV.)/DESERT= 18.7%  
 MOUNTAIN= 61.1%;FOOTHILL= 15.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 53559.81  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23363.46  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26719.93  
 TOTAL AREA(ACRES) = 53559.81 PEAK FLOW RATE(CFS) = 27138.42  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 123.25  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	A	101.40	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	119.30	0.30	1.00	63
AGRICULTURAL POOR COVER					
"FALLOW"	B	19.80	0.30	1.00	86
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	201.90	0.30	0.50	56
NATURAL POOR COVER					
"BARREN"	B	189.50	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	335.80	0.30	1.00	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.31  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
 SUBAREA AREA(ACRES) = 967.70

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.63;30M= 1.20;1H= 1.66;3H= 3.10;6H= 4.60;24H= 8.10  
 S-GRAPH: VALLEY(DEV.)= 5.5%;VALLEY(UNDEV.)/DESERT= 18.3%  
 MOUNTAIN= 61.2%;FOOTHILL= 14.9%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.33; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR = 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 54527.51  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23524.73  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 26894.48  
 TOTAL AREA(ACRES) = 54527.51 PEAK FLOW RATE(CFS) = 27138.42  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 123.25  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
URBAN FAIR COVER					
"TURF"	B	139.20	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	113.30	0.30	1.00	66
COMMERCIAL	B	352.90	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	174.00	0.30	1.00	69
PUBLIC PARK	B	22.20	0.30	0.85	56
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	85.90	0.30	0.20	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.56  
 SUBAREA AREA(ACRES) = 887.50

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.63;30M= 1.20;1H= 1.66;3H= 3.09;6H= 4.58;24H= 8.06  
 S-GRAPH: VALLEY(DEV.)= 5.8%;VALLEY(UNDEV.)/DESERT= 18.0%



MOUNTAIN= 61.3%;FOOTHILL= 14.8%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.32; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 55415.01  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23748.61  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 27132.73  
 TOTAL AREA(ACRES) = 55415.01 PEAK FLOW RATE(CFS) = 27138.42  
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 123.25

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

NATURAL FAIR COVER						
"CHAPARRAL,NARROWLEAF"	B	2.40	0.30	1.00	72	
RESIDENTIAL						
"3-4 DWELLINGS/ACRE"	B	76.70	0.30	0.60	56	
NATURAL FAIR COVER						
"WOODLAND"	B	223.60	0.30	1.00	60	
NATURAL FAIR COVER						
"CHAPARRAL,BROADLEAF"	C	252.20	0.25	1.00	75	
AGRICULTURAL POOR COVER						
"FALLOW"	C	67.20	0.25	1.00	91	
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	322.30	0.25	0.50	69	

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.80  
 SUBAREA AREA(ACRES) = 944.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.63;30M= 1.20;1H= 1.66;3H= 3.08;6H= 4.56;24H= 8.02  
 S-GRAPH: VALLEY(DEV.)= 6.1%;VALLEY(UNDEV.)/DESERT= 17.7%  
 MOUNTAIN= 61.4%;FOOTHILL= 14.7%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.32; 30M = 0.38; 1HR = 0.42;  
 3HR = 0.77; 6HR = 0.90; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 56359.41  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 23948.69  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 27346.48  
 TOTAL AREA(ACRES) = 56359.41 PEAK FLOW RATE(CFS) = 27346.48

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 123.25

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

NATURAL POOR COVER						
"BARREN"	C	117.80	0.25	1.00	91	
NATURAL FAIR COVER						
"GRASS"	C	615.70	0.25	1.00	79	
URBAN FAIR COVER						
"TURF"	C	52.40	0.25	1.00	77	
AGRICULTURAL FAIR COVER						
"PASTURE,DRYLAND"	C	183.90	0.25	1.00	79	
NATURAL FAIR COVER						
"OPEN BRUSH"	C	1315.50	0.25	1.00	77	
COMMERCIAL	C	417.30	0.25	0.10	69	

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.86  
 SUBAREA AREA(ACRES) = 2702.60

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.65;3H= 3.05;6H= 4.50;24H= 7.91  
 S-GRAPH: VALLEY(DEV.)= 6.9%;VALLEY(UNDEV.)/DESERT= 16.9%

MOUNTAIN= 61.7%;FOOTHILL= 14.4%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.37; 1HR = 0.41;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 59062.01  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 24628.19  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28009.83  
 TOTAL AREA(ACRES) = 59062.01 PEAK FLOW RATE(CFS) = 28009.83

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 123.25

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  
 DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
 LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN

PUBLIC PARK	C	0.70	0.25	0.85	69	
NATURAL GOOD COVER						
"MEADOWS"	C	4.00	0.25	1.00	71	
RESIDENTIAL						
"11+ DWELLINGS/ACRE"	C	460.80	0.25	0.20	69	
NATURAL FAIR COVER						
"CHAPARRAL,NARROWLEAF"	C	26.10	0.25	1.00	81	
RESIDENTIAL						
"3-4 DWELLINGS/ACRE"	C	228.40	0.25	0.60	69	
NATURAL FAIR COVER						
"WOODLAND"	C	211.80	0.25	1.00	73	

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.51  
 SUBAREA AREA(ACRES) = 931.80

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.04;6H= 4.49;24H= 7.87  
 S-GRAPH: VALLEY(DEV.)= 7.2%;VALLEY(UNDEV.)/DESERT= 16.7%

MOUNTAIN= 61.8%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.23; Ybar = 0.34

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.37; 1HR = 0.41;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 59993.81  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 24905.06  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28296.49  
 TOTAL AREA(ACRES) = 59993.81 PEAK FLOW RATE(CFS) = 28296.49

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 123.25  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	112.90	0.20	1.00	81
PUBLIC PARK	D	44.50	0.20	0.85	75
AGRICULTURAL POOR COVER					
"FALLOW"	D	12.50	0.20	1.00	94
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	91.50	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	9.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	204.00	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.89  
 SUBAREA AREA(ACRES) = 475.00

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.04;6H= 4.48;24H= 7.86  
 S-GRAPH: VALLEY(DEV.)= 7.3%;VALLEY(UNDEV.)/DESERT= 16.5%  
 MOUNTAIN= 61.9%;FOOTHILL= 14.3%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.22; Ybar = 0.34  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.76; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 60468.81  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 25037.67  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28427.38  
 TOTAL AREA(ACRES) = 60468.81 PEAK FLOW RATE(CFS) = 28427.38

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 123.25  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,BROADLEAF"	D	112.90	0.20	1.00	81
PUBLIC PARK	D	44.50	0.20	0.85	75
AGRICULTURAL POOR COVER					
"FALLOW"	D	12.50	0.20	1.00	94
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	91.50	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	9.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	204.00	0.20	1.00	84

LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	0.40	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	5.80	0.20	1.00	82
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	95.90	0.20	1.00	84
NATURAL FAIR COVER					
"OPEN BRUSH"	D	171.90	0.20	1.00	83
COMMERCIAL	D	35.50	0.20	0.10	75
NATURAL GOOD COVER					
"MEADOWS"	D	1.60	0.20	1.00	78

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
 SUBAREA AREA(ACRES) = 311.10

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.03;6H= 4.47;24H= 7.85  
 S-GRAPH: VALLEY(DEV.)= 7.4%;VALLEY(UNDEV.)/DESERT= 16.5%  
 MOUNTAIN= 61.9%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.22; Ybar = 0.34

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 60779.91  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 25126.50  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28513.64  
 TOTAL AREA(ACRES) = 60779.91 PEAK FLOW RATE(CFS) = 28513.64

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1065.00 TO NODE 1066.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 123.25  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	D	357.30	0.20	0.20	75
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	11.30	0.20	1.00	86
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	D	309.70	0.20	0.60	75
NATURAL FAIR COVER					
"WOODLAND"	D	41.70	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.43  
 SUBAREA AREA(ACRES) = 720.00

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.03;6H= 4.46;24H= 7.82  
 S-GRAPH: VALLEY(DEV.)= 7.6%;VALLEY(UNDEV.)/DESERT= 16.3%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.05; LAG(HR) = 1.64; Fm(INCH/HR) = 0.22; Ybar = 0.34

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 61499.91  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0261; Lca/L=0.4,n=.0234; Lca/L=0.5,n=.0215;Lca/L=0.6,n=.0200

TIME OF PEAK FLOW(HR) = 17.75    RUNOFF VOLUME(AF) =    25364.76  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28756.93  
TOTAL AREA(ACRES) = 61499.91        PEAK FLOW RATE(CFS) =    28756.93

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES)        = 61499.91    TC(MIN.) =        123.25  
AREA-AVERAGED Fm(INCH/HR)= 0.22    Ybar = 0.34  
PEAK FLOW RATE(CFS)     = 28756.93

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
(c) Copyright 1983-2003 Advanced Engineering Software (aes)  
Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LP67100H.DAT  
TIME/DATE OF STUDY: 08:17 02/26/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----\*TIME-OF-CONCENTRATION MODEL\*-----  
  
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

\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1) 5.000; 10.000  
2) 10.000; 6.000  
3) 15.000; 4.500  
4) 20.000; 3.600  
5) 30.000; 2.750  
6) 60.000; 1.950  
7) 120.000; 1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc  
S-GRAPH TYPE PERCENTAGE(DECIMAL)  
VALLEY(DEVELOPED) 0.160  
FOOTHILL 0.140  
MOUNTAIN 0.620  
VALLEY(UNDEVELOPED)/DESERT 0.080  
DESERT(UNDEVELOPED) 0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LP66100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 28756.93 Tc(MIN.) = 123.25  
AREA-AVERAGED Fm(INCH/HR) = 0.22 Ybar = 0.34  
TOTAL AREA(ACRES) = 61499.91  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 28756.93 Tc(MIN.) = 123.25  
AREA-AVERAGED Fm(INCH/HR) = 0.22 Ybar = 0.34  
TOTAL AREA(ACRES) = 61499.91  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1066.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1066.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 213.00 DOWNSTREAM(FEET) = 176.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6201.00 CHANNEL SLOPE = 0.0060  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 28756.93  
FLOW VELOCITY(FEET/SEC.) = 18.47 FLOW DEPTH(FEET) = 13.82  
TRAVEL TIME(MIN.) = 5.60 Tc(MIN.) = 128.85  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 128.85  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.961  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL POOR COVER					
"FALLOW"	A	0.20	0.40	1.00	77
NATURAL FAIR COVER					
"GRASS"	A	0.90	0.40	1.00	50
NATURAL FAIR COVER					
"OPEN BRUSH"	A	8.90	0.40	1.00	46
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	5.50	0.40	1.00	49
NATURAL FAIR COVER					
"WOODLAND"	A	17.90	0.40	1.00	36
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	B	23.90	0.30	1.00	63

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.36  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 57.30  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.03;6H= 4.46;24H= 7.82  
S-GRAPH: VALLEY(DEV.)= 7.6%;VALLEY(UNDEV.)/DESERT= 16.3%  
MOUNTAIN= 62.0%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.22; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.31; 30M = 0.36; 1HR = 0.41;  
3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 61557.22  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 25366.47  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28377.06  
TOTAL AREA(ACRES) = 61557.22 PEAK FLOW RATE(CFS) = 28756.93  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
MAINLINE Tc(MIN) = 128.85  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
AGRICULTURAL POOR COVER  
"FALLOW" B 180.40 0.30 1.00 86  
RESIDENTIAL  
"5-7 DWELLINGS/ACRE" B 89.60 0.30 0.50 56  
NATURAL FAIR COVER  
"GRASS" B 327.50 0.30 1.00 69  
AGRICULTURAL FAIR COVER  
"ORCHARDS" B 6.00 0.30 1.00 65  
URBAN FAIR COVER  
"TURF" B 105.00 0.30 1.00 65  
NATURAL FAIR COVER  
"OPEN BRUSH" B 118.90 0.30 1.00 66  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
SUBAREA AREA(ACRES) = 827.40  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.02;6H= 4.44;24H= 7.79  
S-GRAPH: VALLEY(DEV.)= 7.7%;VALLEY(UNDEV.)/DESERT= 16.1%  
MOUNTAIN= 62.0%;FOOTHILL= 14.2%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.22; Ybar = 0.34  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.41;  
3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 62384.62  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 25517.30  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28524.33  
TOTAL AREA(ACRES) = 62384.62 PEAK FLOW RATE(CFS) = 28756.93  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
\*\*\*\*\*  
MAINLINE Tc(MIN) = 128.85  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
COMMERCIAL B 7.80 0.30 0.10 56  
AGRICULTURAL FAIR COVER  
"PASTURE, DRYLAND" B 418.80 0.30 1.00 69  
NATURAL GOOD COVER  
"MEADOWS" B 0.90 0.30 1.00 58  
NATURAL FAIR COVER  
"CHAPARRAL, NARROWLEAF" B 0.40 0.30 1.00 72  
RESIDENTIAL  
"3-4 DWELLINGS/ACRE" B 50.90 0.30 0.60 56  
NATURAL FAIR COVER  
"WOODLAND" B 51.70 0.30 1.00 60  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
SUBAREA AREA(ACRES) = 530.50  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.62;30M= 1.19;1H= 1.64;3H= 3.01;6H= 4.43;24H= 7.77  
S-GRAPH: VALLEY(DEV.)= 7.8%;VALLEY(UNDEV.)/DESERT= 16.1%  
MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.22; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.40;  
3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 62915.12  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 25600.04  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28610.40  
TOTAL AREA(ACRES) = 62915.12 PEAK FLOW RATE(CFS) = 28756.93  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
MAINLINE Tc(MIN) = 128.85  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):  
DEVELOPMENT TYPE/ SCS SOIL AREA Fp Ap SCS  
LAND USE GROUP (ACRES) (INCH/HR) (DECIMAL) CN  
NATURAL FAIR COVER  
"CHAPARRAL, BROADLEAF" C 203.60 0.25 1.00 75  
AGRICULTURAL POOR COVER  
"FALLOW" C 124.30 0.25 1.00 91  
NATURAL POOR COVER  
"BARREN" C 7.60 0.25 1.00 91  
NATURAL FAIR COVER  
"GRASS" C 485.30 0.25 1.00 79  
AGRICULTURAL FAIR COVER  
"ORCHARDS" C 0.70 0.25 1.00 77  
URBAN FAIR COVER  
"TURF" C 4.90 0.25 1.00 77  
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 1.00  
SUBAREA AREA(ACRES) = 826.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.62;30M= 1.18;1H= 1.63;3H= 3.00;6H= 4.42;24H= 7.74  
 S-GRAPH: VALLEY(DEV.)= 7.9%;VALLEY(UNDEV.)/DESERT= 16.0%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.22; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.36; 1HR = 0.40;  
 3HR = 0.75; 6HR = 0.89; 24HR= 0.94  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 63741.52  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 25795.92  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 28789.62  
 TOTAL AREA(ACRES) = 63741.52 PEAK FLOW RATE(CFS) = 28789.62

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 128.85  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"OPEN BRUSH"	C	940.00	0.25	1.00	77
COMMERCIAL	C	10.80	0.25	0.10	69
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	C	128.10	0.25	1.00	79
NATURAL GOOD COVER					
"MEADOWS"	C	0.20	0.25	1.00	71
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	C	17.90	0.25	0.20	69
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	C	125.40	0.25	0.60	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.94  
 SUBAREA AREA(ACRES) = 1222.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.63;3H= 2.99;6H= 4.40;24H= 7.70  
 S-GRAPH: VALLEY(DEV.)= 8.1%;VALLEY(UNDEV.)/DESERT= 15.8%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.22; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.30; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 64963.91  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26065.79  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 29049.74  
 TOTAL AREA(ACRES) = 64963.91 PEAK FLOW RATE(CFS) = 29049.74

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 128.85  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"WOODLAND"	C	94.10	0.25	1.00	73
NATURAL FAIR COVER					
"CHAPARRAL, BROADLEAF"	D	159.90	0.20	1.00	81
AGRICULTURAL POOR COVER					
"FALLOW"	D	77.90	0.20	1.00	94
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	104.60	0.20	0.50	75
NATURAL POOR COVER					
"BARREN"	D	0.60	0.20	1.00	93
NATURAL FAIR COVER					
"GRASS"	D	635.30	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.95  
 SUBAREA AREA(ACRES) = 1072.40

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.63;3H= 2.98;6H= 4.38;24H= 7.67  
 S-GRAPH: VALLEY(DEV.)= 8.2%;VALLEY(UNDEV.)/DESERT= 15.7%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
 Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.22; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66036.31  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26351.26  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 29322.41  
 TOTAL AREA(ACRES) = 66036.31 PEAK FLOW RATE(CFS) = 29322.41

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
 FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81  
 -----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

\*\*\*\*\*  
 MAINLINE Tc(MIN) = 128.85  
 \*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
 \* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
 SUBAREA LOSS RATE DATA(AMC II):  

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"ORCHARDS"	D	0.90	0.20	1.00	82
URBAN FAIR COVER					
"TURF"	D	8.20	0.20	1.00	82
NATURAL FAIR COVER					
"OPEN BRUSH"	D	334.50	0.20	1.00	83
COMMERCIAL	D	11.70	0.20	0.10	75
PUBLIC PARK	D	0.10	0.20	0.85	75
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	D	3.80	0.20	0.20	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.96  
 SUBAREA AREA(ACRES) = 359.20

UNIT-HYDROGRAPH DATA:  
 RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.63;3H= 2.98;6H= 4.38;24H= 7.66  
 S-GRAPH: VALLEY(DEV.)= 8.2%;VALLEY(UNDEV.)/DESERT= 15.7%  
 MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.22; Ybar = 0.35  
 USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
 DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
 3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
 UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66395.52  
 LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.  
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
 Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200  
 TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26446.74  
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 29414.22  
 TOTAL AREA(ACRES) = 66395.52 PEAK FLOW RATE(CFS) = 29414.22

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
 5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*

FLOW PROCESS FROM NODE 1066.00 TO NODE 1067.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

=====

MAINLINE Tc(MIN) = 128.85

\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE

\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550

SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER					
"CHAPARRAL,NARROWLEAF"	D	7.80	0.20	1.00	86
AGRICULTURAL FAIR COVER					
"PASTURE,DRYLAND"	D	61.40	0.20	1.00	84
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	D	156.10	0.20	0.60	75
NATURAL FAIR COVER					
"WOODLAND"	D	63.80	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.78

SUBAREA AREA(ACRES) = 289.10

UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.63;3H= 2.98;6H= 4.37;24H= 7.65

S-GRAPH: VALLEY(DEV.)= 8.3%;VALLEY(UNDEV.)/DESERT= 15.6%

MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.15; LAG(HR) = 1.72; Fm(INCH/HR) = 0.22; Ybar = 0.35

USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;

3HR = 0.74; 6HR = 0.89; 24HR= 0.93

UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66684.62

LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

EQUIVALENT BASIN FACTOR APPROXIMATIONS:

Lca/L=0.3,n=.0260; Lca/L=0.4,n=.0233; Lca/L=0.5,n=.0214;Lca/L=0.6,n=.0200

TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26524.58

UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 29491.61

TOTAL AREA(ACRES) = 66684.62 PEAK FLOW RATE(CFS) = 29491.61

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):

5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

=====

END OF STUDY SUMMARY:

TOTAL AREA(ACRES) = 66684.62 TC(MIN.) = 128.85

AREA-AVERAGED Fm(INCH/HR)= 0.22 Ybar = 0.35

PEAK FLOW RATE(CFS) = 29491.61

=====

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

\*\*\*\*\*  
RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE  
(Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)  
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Ver. 8.0 Release Date: 01/01/2003 License ID 1202

Analysis prepared by:

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714 - 734 - 5100

-----  
FILE NAME: LP68100H.DAT  
TIME/DATE OF STUDY: 08:17 02/26/2004  
-----

=====

USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:  
=====

-----  
--\*TIME-OF-CONCENTRATION MODEL\*--  
=====

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  
\*USER-DEFINED TABLED RAINFALL USED\*  
NUMBER OF [TIME,INTENSITY] DATA PAIRS = 7

1)	5.000;	10.000
2)	10.000;	6.000
3)	15.000;	4.500
4)	20.000;	3.600
5)	30.000;	2.750
6)	60.000;	1.950
7)	120.000;	1.550

\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD\*

\*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) (n)  
=====

1	30.0	20.0	0.018/0.018/0.020	0.67	2.00	0.0312	0.167	0.0150
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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.\*  
\*USER-SPECIFIED MINIMUM TOPOGRAPHIC SLOPE ADJUSTMENT NOT SELECTED

UNIT-HYDROGRAPH MODEL SELECTIONS/PARAMETERS:  
WATERSHED LAG = 0.80 \* Tc

S-GRAPH TYPE	PERCENTAGE(DECIMAL)
VALLEY(DEVELOPED)	0.250
FOOTHILL	0.140
MOUNTAIN	0.180
VALLEY(UNDEVELOPED)/DESERT	0.430
DESERT(UNDEVELOPED)	0.000

PRECIPITATION DATA ENTERED ON SUBAREA BASIS.  
SIERRA MADRE DEPTH-AREA FACTORS USED.  
\*ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR UNIT HYDROGRAPH METHOD\*

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 15.1  
-----

>>>>DEFINE MEMORY BANK # 1 <<<<<  
=====

PEAK FLOWRATE TABLE FILE NAME: LP67100H.DNA  
MEMORY BANK # 1 DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 29491.61 Tc(MIN.) = 128.85  
AREA-AVERAGED Fm(INCH/HR) = 0.22 Ybar = 0.35  
TOTAL AREA(ACRES) = 66684.62  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 14.0  
-----

>>>>MEMORY BANK # 1 COPIED ONTO MAIN-STREAM MEMORY<<<<<  
=====

MAIN-STREAM MEMORY DEFINED AS FOLLOWS:  
PEAK FLOW RATE(CFS) = 29491.61 Tc(MIN.) = 128.85  
AREA-AVERAGED Fm(INCH/HR) = 0.22 Ybar = 0.35  
TOTAL AREA(ACRES) = 66684.62  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1067.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1067.00 IS CODE = 12  
-----

>>>>CLEAR MEMORY BANK # 1 <<<<<  
=====

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 51  
-----

>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<  
>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<  
=====

ELEVATION DATA: UPSTREAM(FEET) = 176.00 DOWNSTREAM(FEET) = 133.00  
CHANNEL LENGTH THRU SUBAREA(FEET) = 6324.00 CHANNEL SLOPE = 0.0068  
CHANNEL BASE(FEET) = 85.00 "Z" FACTOR = 2.000  
MANNING'S FACTOR = 0.030 MAXIMUM DEPTH(FEET) = 15.00  
CHANNEL FLOW THRU SUBAREA(CFS) = 29491.61  
FLOW VELOCITY(FEET/SEC.) = 19.48 FLOW DEPTH(FEET) = 13.52  
TRAVEL TIME(MIN.) = 5.41 Tc(MIN.) = 134.26  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81  
-----

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<  
=====

MAINLINE Tc(MIN) = 134.26  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 0.939  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	A	1.30	0.40	1.00	40
NATURAL GOOD COVER "MEADOWS"	A	0.30	0.40	1.00	30
NATURAL FAIR COVER "GRASS"	A	1.80	0.40	1.00	50
AGRICULTURAL FAIR COVER "ORCHARDS"	A	0.90	0.40	1.00	44
NATURAL FAIR COVER "OPEN BRUSH"	A	3.10	0.40	1.00	46
COMMERCIAL	A	23.30	0.40	0.10	32

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.40  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.32  
SUBAREA AREA(ACRES) = 30.70  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.63;3H= 2.98;6H= 4.37;24H= 7.65



S-GRAPH: VALLEY(DEV.)= 8.3%;VALLEY(UNDEV.)/DESERT= 15.6%  
MOUNTAIN= 62.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.22; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66715.32  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26532.75  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 29104.44  
TOTAL AREA(ACRES) = 66715.32 PEAK FLOW RATE(CFS) = 29491.61  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 134.26  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	A	1.60	0.40	1.00	49
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	A	6.70	0.40	0.20	32
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	A	33.60	0.40	0.60	32
NATURAL FAIR COVER					
"WOODLAND"	A	19.30	0.40	1.00	36
AGRICULTURAL POOR COVER					
"FALLOW"	B	4.10	0.30	1.00	86
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	16.50	0.30	0.50	56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.38  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.67  
SUBAREA AREA(ACRES) = 81.80  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.63;3H= 2.98;6H= 4.37;24H= 7.65  
S-GRAPH: VALLEY(DEV.)= 8.3%;VALLEY(UNDEV.)/DESERT= 15.7%  
MOUNTAIN= 61.9%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.22; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66797.12  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26542.31  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 29117.42  
TOTAL AREA(ACRES) = 66797.12 PEAK FLOW RATE(CFS) = 29491.61  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 134.26  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL POOR COVER					
"BARREN"	B	2.00	0.30	1.00	86
NATURAL FAIR COVER					
"GRASS"	B	7.10	0.30	1.00	69
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	0.40	0.30	1.00	65
NATURAL FAIR COVER					
"OPEN BRUSH"	B	0.70	0.30	1.00	66
COMMERCIAL	B	42.80	0.30	0.10	56
AGRICULTURAL FAIR COVER					
"PASTURE, DRYLAND"	B	10.70	0.30	1.00	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.40  
SUBAREA AREA(ACRES) = 63.70  
UNIT-HYDROGRAPH DATA:

RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.62;3H= 2.98;6H= 4.37;24H= 7.64  
S-GRAPH: VALLEY(DEV.)= 8.3%;VALLEY(UNDEV.)/DESERT= 15.7%  
MOUNTAIN= 61.9%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.22; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 66860.82  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26561.42  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 29137.49  
TOTAL AREA(ACRES) = 66860.82 PEAK FLOW RATE(CFS) = 29491.61  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 134.26  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"11+ DWELLINGS/ACRE"	B	77.60	0.30	0.20	56
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	B	14.90	0.30	0.60	56
NATURAL FAIR COVER					
"WOODLAND"	B	6.90	0.30	1.00	60
NATURAL FAIR COVER					
"GRASS"	C	218.60	0.25	1.00	79
NATURAL FAIR COVER					
"OPEN BRUSH"	C	70.80	0.25	1.00	77
COMMERCIAL	C	12.90	0.25	0.10	69

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.80  
SUBAREA AREA(ACRES) = 401.70  
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.62;3H= 2.97;6H= 4.36;24H= 7.63

S-GRAPH: VALLEY(DEV.)= 8.4%;VALLEY(UNDEV.)/DESERT= 15.9%  
MOUNTAIN= 61.6%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.22; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.40;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 67262.52  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26659.57  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 29239.52  
TOTAL AREA(ACRES) = 67262.52 PEAK FLOW RATE(CFS) = 29491.61  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 134.26  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
PUBLIC PARK	C	0.20	0.25	0.85	69
RESIDENTIAL "3-4 DWELLINGS/ACRE"	C	0.90	0.25	0.60	69
NATURAL FAIR COVER "WOODLAND"	C	19.50	0.25	1.00	73
AGRICULTURAL POOR COVER "FALLOW"	D	35.60	0.20	1.00	94
RESIDENTIAL "5-7 DWELLINGS/ACRE"	D	140.20	0.20	0.50	75
NATURAL POOR COVER "BARREN"	D	0.60	0.20	1.00	93

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.21  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.64  
SUBAREA AREA(ACRES) = 197.00

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.62;3H= 2.97;6H= 4.36;24H= 7.63  
S-GRAPH: VALLEY(DEV.)= 8.5%;VALLEY(UNDEV.)/DESERT= 15.9%  
MOUNTAIN= 61.5%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%  
Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.22; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 67459.52  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26718.33  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 29300.24  
TOTAL AREA(ACRES) = 67459.52 PEAK FLOW RATE(CFS) = 29491.61  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 134.26  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
NATURAL FAIR COVER "GRASS"	D	332.20	0.20	1.00	84
AGRICULTURAL FAIR COVER "ORCHARDS"	D	1.10	0.20	1.00	82
URBAN FAIR COVER "TURF"	D	1.20	0.20	1.00	82
NATURAL FAIR COVER "OPEN BRUSH"	D	172.80	0.20	1.00	83
COMMERCIAL AGRICULTURAL FAIR COVER "PASTURE,DRYLAND"	D	60.20	0.20	0.10	75
D		1.80	0.20	1.00	84

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.90  
SUBAREA AREA(ACRES) = 569.30

UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.62;3H= 2.97;6H= 4.35;24H= 7.61  
S-GRAPH: VALLEY(DEV.)= 8.6%;VALLEY(UNDEV.)/DESERT= 16.2%  
MOUNTAIN= 61.1%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.22; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.  
DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;  
3HR = 0.74; 6HR = 0.89; 24HR= 0.93  
UNIT-INTERVAL(MIN) = 15.00 TOTAL AREA(ACRES) = 68028.82  
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = \*\*\*\*\* FEET.  
EQUIVALENT BASIN FACTOR APPROXIMATIONS:  
Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199  
TIME OF PEAK FLOW(HR) = 17.75 RUNOFF VOLUME(AF) = 26876.03  
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 29459.72  
TOTAL AREA(ACRES) = 68028.82 PEAK FLOW RATE(CFS) = 29491.61  
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):  
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63

\*\*\*\*\*  
FLOW PROCESS FROM NODE 1067.00 TO NODE 1068.00 IS CODE = 81

>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

MAINLINE Tc(MIN) = 134.26  
\*ERROR-TIME OF CONCENTRATION EXCEEDS RAINFALL TABLE  
\* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 1.550  
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL "11+ DWELLINGS/ACRE"	D	143.90	0.20	0.20	75
NATURAL FAIR COVER "CHAPARRAL,BROADLEAF"	D	4.90	0.20	1.00	81
RESIDENTIAL "3-4 DWELLINGS/ACRE"	D	6.00	0.20	0.60	75
NATURAL FAIR COVER "WOODLAND"	D	61.30	0.20	1.00	79

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20  
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.46  
SUBAREA AREA(ACRES) = 216.10

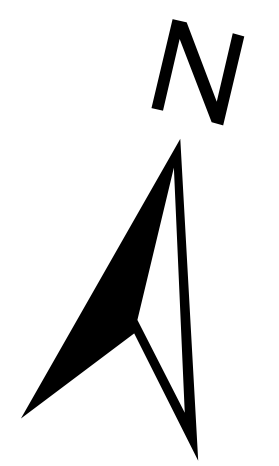
UNIT-HYDROGRAPH DATA:  
RAINFALL(INCH): 5M= 0.61;30M= 1.18;1H= 1.62;3H= 2.97;6H= 4.35;24H= 7.60  
S-GRAPH: VALLEY(DEV.)= 8.7%;VALLEY(UNDEV.)/DESERT= 16.2%  
MOUNTAIN= 61.0%;FOOTHILL= 14.1%;DESERT(UNDEV.)= 0.0%

Tc(HR) = 2.24; LAG(HR) = 1.79; Fm(INCH/HR) = 0.22; Ybar = 0.35  
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC II CONDITION.

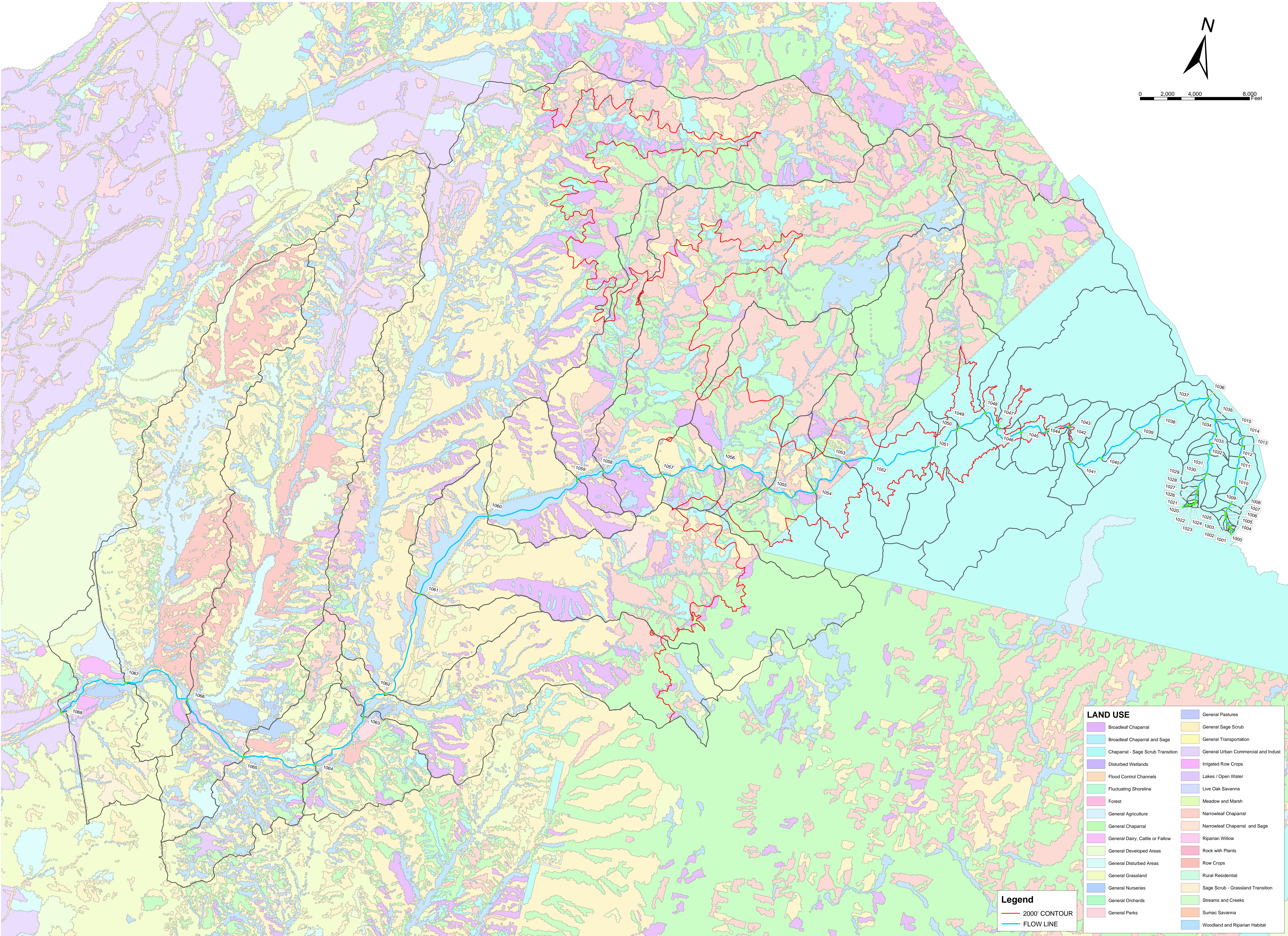
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DEPTH-AREA FACTORS: 5M = 0.29; 30M = 0.35; 1HR = 0.39;
3HR = 0.74; 6HR = 0.89; 24HR= 0.93
UNIT-INTERVAL(MIN) = 15.00  TOTAL AREA(ACRES) = 68244.92
LONGEST FLOWPATH FROM NODE 1000.00 TO NODE 1068.00 = ***** FEET.
EQUIVALENT BASIN FACTOR APPROXIMATIONS:
Lca/L=0.3,n=.0259; Lca/L=0.4,n=.0232; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0199
TIME OF PEAK FLOW(HR) = 17.75  RUNOFF VOLUME(AF) = 26945.42
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) = 29531.73
TOTAL AREA(ACRES) = 68244.92  PEAK FLOW RATE(CFS) = 29531.73

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.52; 30M = 1.09; 1HR = 1.45; 3HR = 2.43; 6HR = 3.36; 24HR = 5.63
=====
END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 68244.92  TC(MIN.) = 134.26
AREA-AVERAGED Fm(INCH/HR)= 0.22  Ybar = 0.35
PEAK FLOW RATE(CFS) = 29531.73
=====
END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
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0 2,000 4,000 8,000 Feet

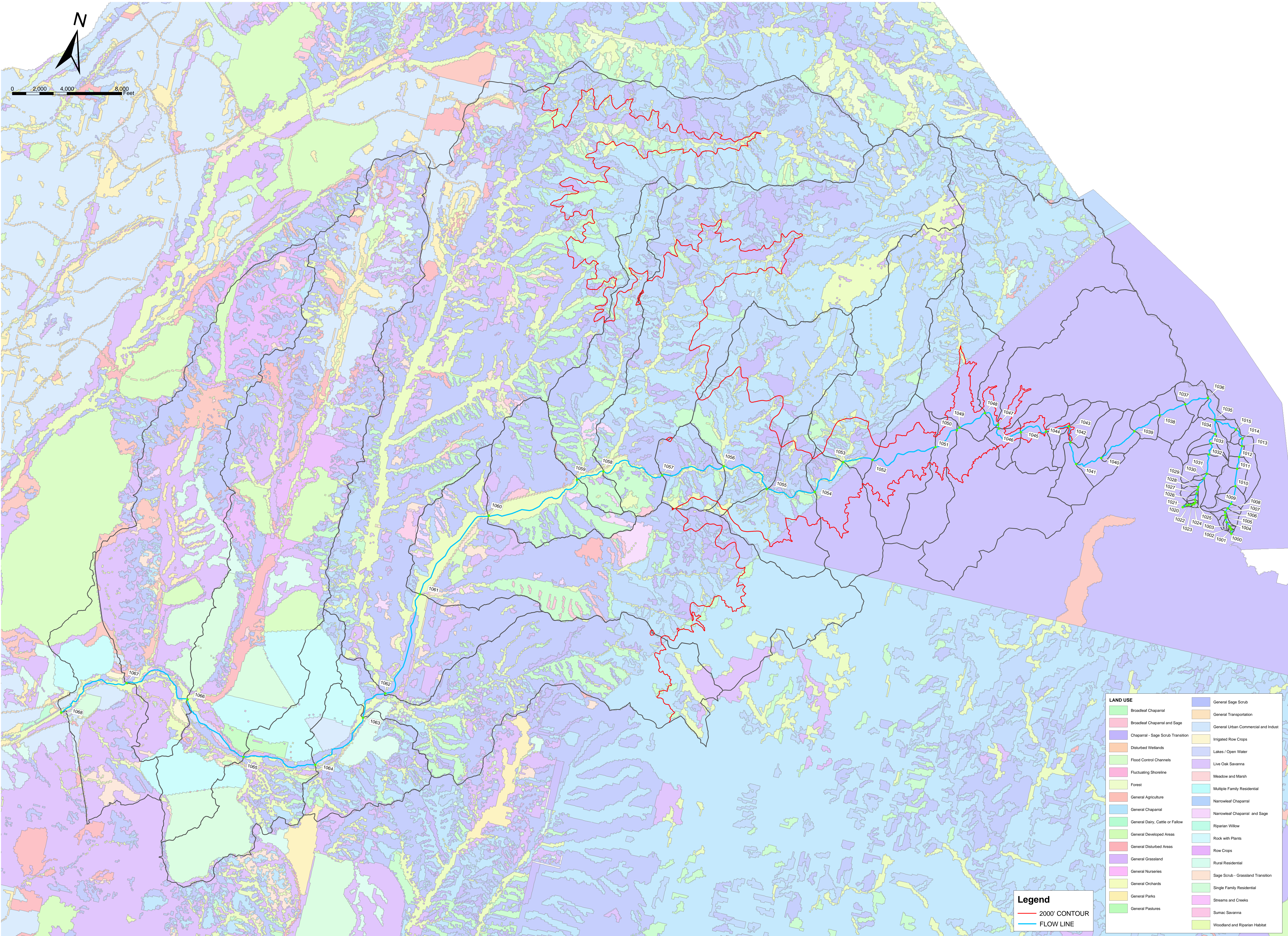
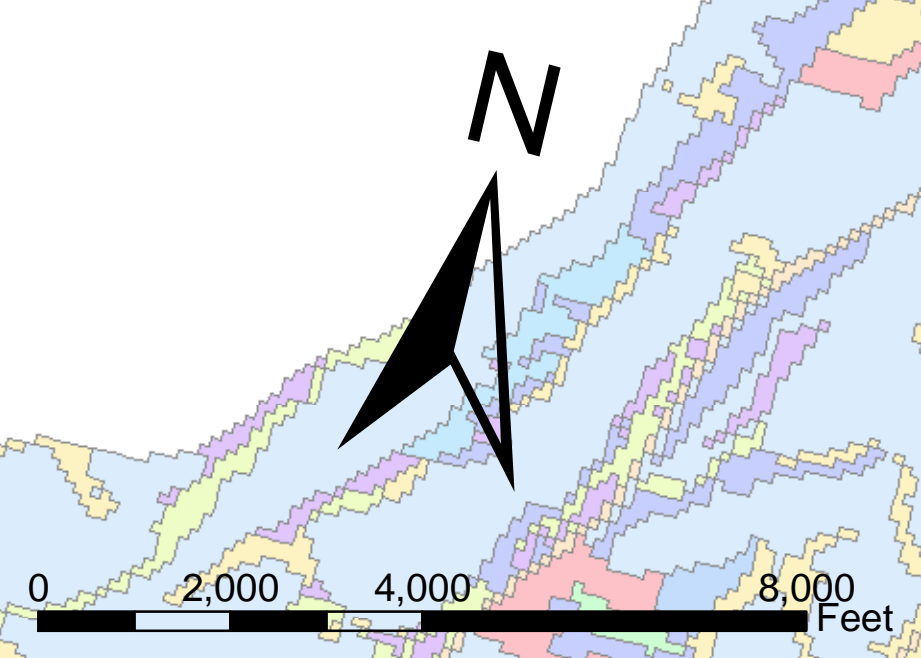


LAND USE	
	Broadleaf Chaparral
	Broadleaf Chaparral and Sage
	Chaparral - Sage Scrub Transition
	Disturbed Wetlands
	Flood Control Channels
	Fluctuating Shoreline
	Forest
	General Agriculture
	General Chaparral
	General Dairy, Cattle or Fallow
	General Developed Areas
	General Disturbed Areas
	General Grassland
	General Nurseries
	General Orchards
	General Parks
	General Pastures
	General Sage Scrub
	General Transportation
	General Urban Commercial and Indust
	Irrigated Row Crops
	Lakes / Open Water
	Live Oak Savanna
	Meadow and Marsh
	Narrowleaf Chaparral
	Narrowleaf Chaparral and Sage
	Riparian Willow
	Rock with Plants
	Row Crops
	Rural Residential
	Sage Scrub - Grassland Transition
	Streams and Creeks
	Sumac Savanna
	Woodland and Riparian Habitat

**Legend**  
— 2000' CONTOUR  
— FLOW LINE

**HYDROLOGIC MAP FOR EXISTING CONDITIONS  
SAN JUAN CREEK CHANNEL**



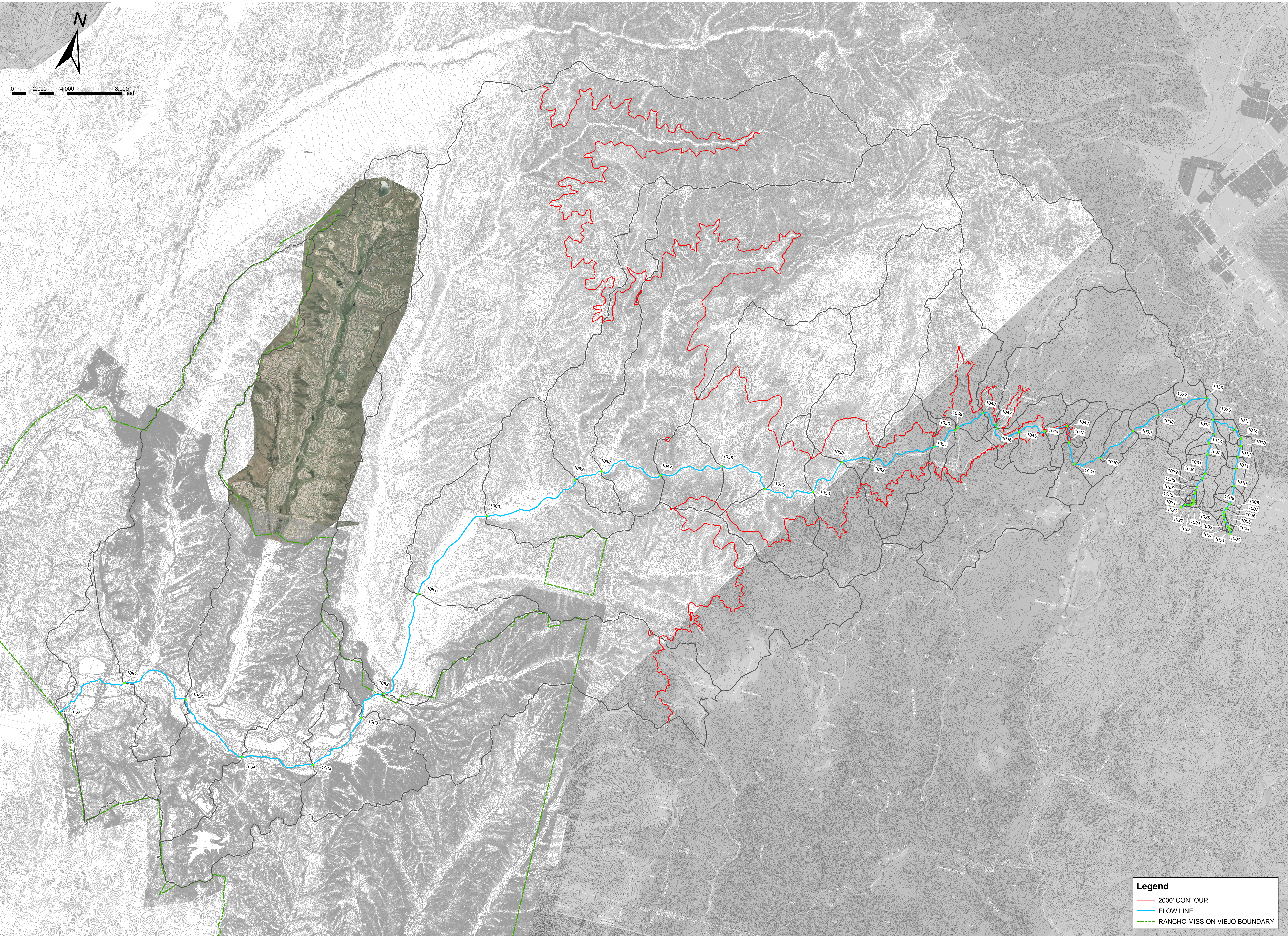
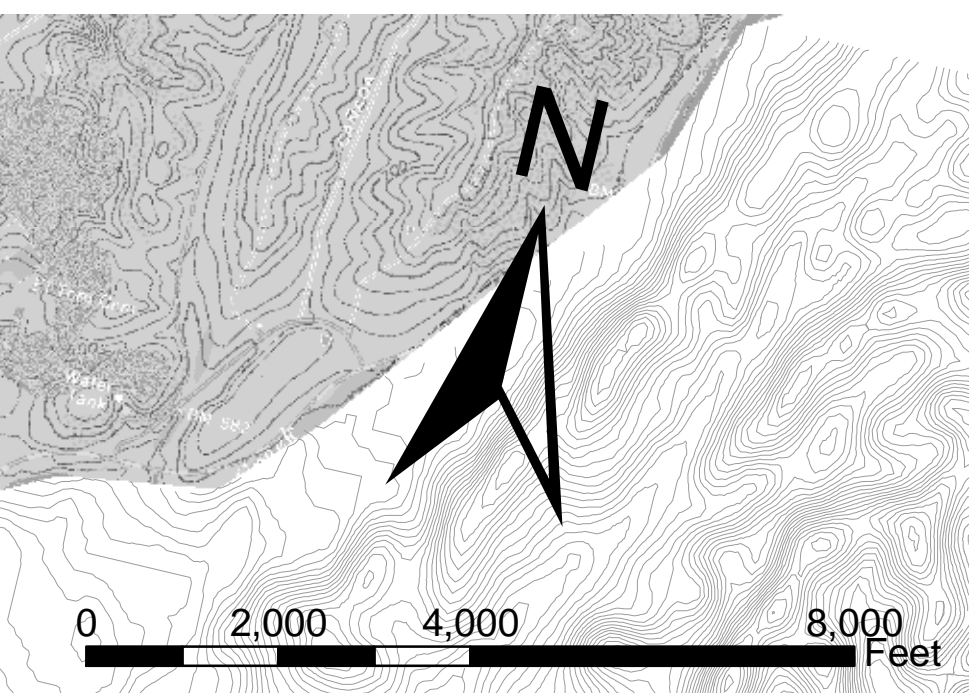


LAND USE	
	Broadleaf Chaparral
	Broadleaf Chaparral and Sage
	Chaparral - Sage Scrub Transition
	Disturbed Wetlands
	Flood Control Channels
	Fluctuating Shoreline
	Forest
	General Agriculture
	General Chaparral
	General Dairy, Cattle or Fallow
	General Developed Areas
	General Disturbed Areas
	General Grassland
	General Nurseries
	General Orchards
	General Parks
	General Pastures
	General Sage Scrub
	General Transportation
	General Urban Commercial and Indust
	Irrigated Row Crops
	Lakes / Open Water
	Live Oak Savanna
	Meadow and Marsh
	Multiple Family Residential
	Narrowleaf Chaparral
	Narrowleaf Chaparral and Sage
	Riparian Willow
	Rock with Plants
	Row Crops
	Rural Residential
	Sage Scrub - Grassland Transition
	Single Family Residential
	Streams and Creeks
	Sumac Savanna
	Woodland and Riparian Habitat

**Legend**  
 2000' CONTOUR  
 FLOW LINE

**HYDROLOGIC MAP FOR PROPOSED CONDITIONS  
 SAN JUAN CREEK CHANNEL**

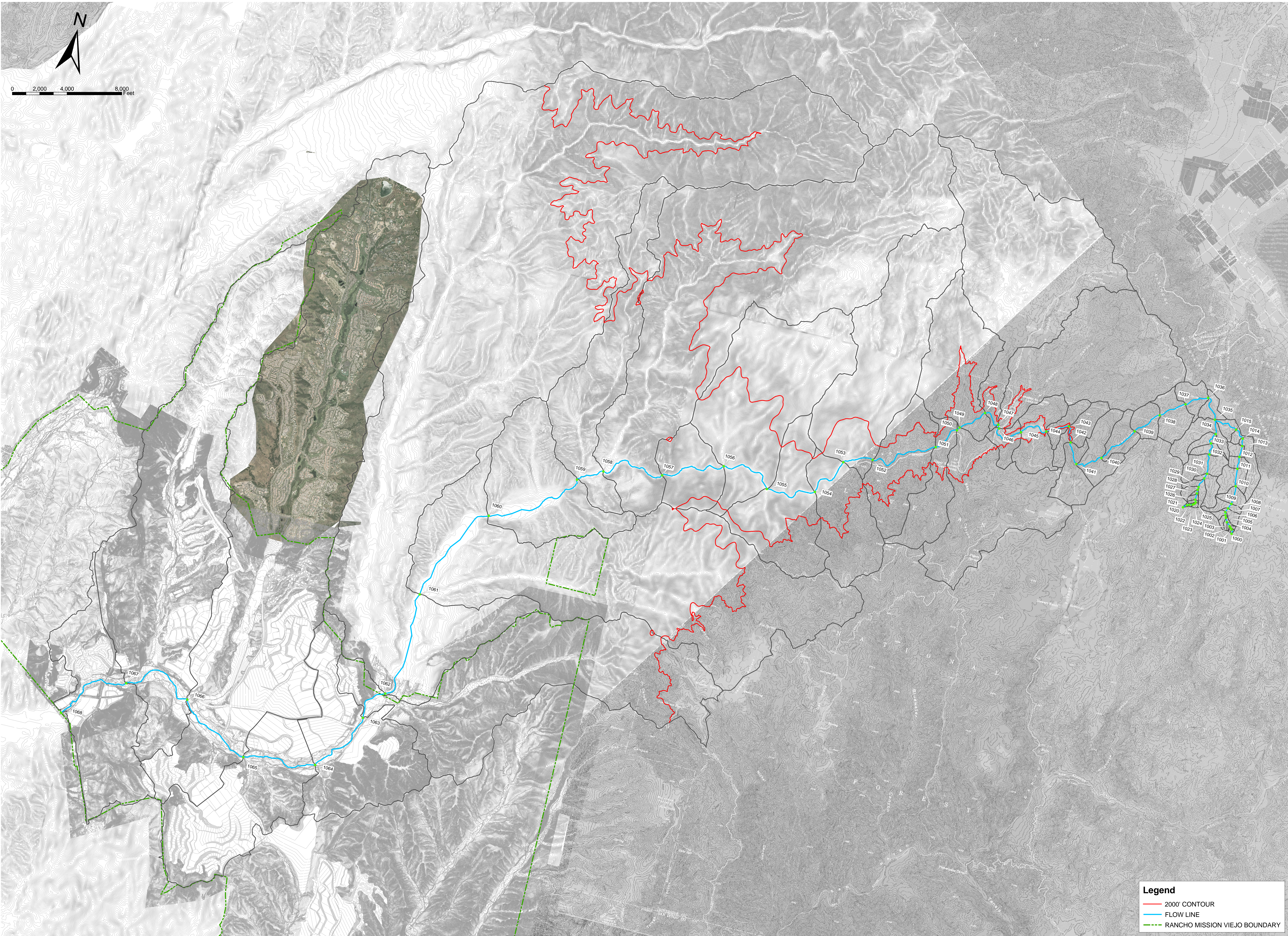
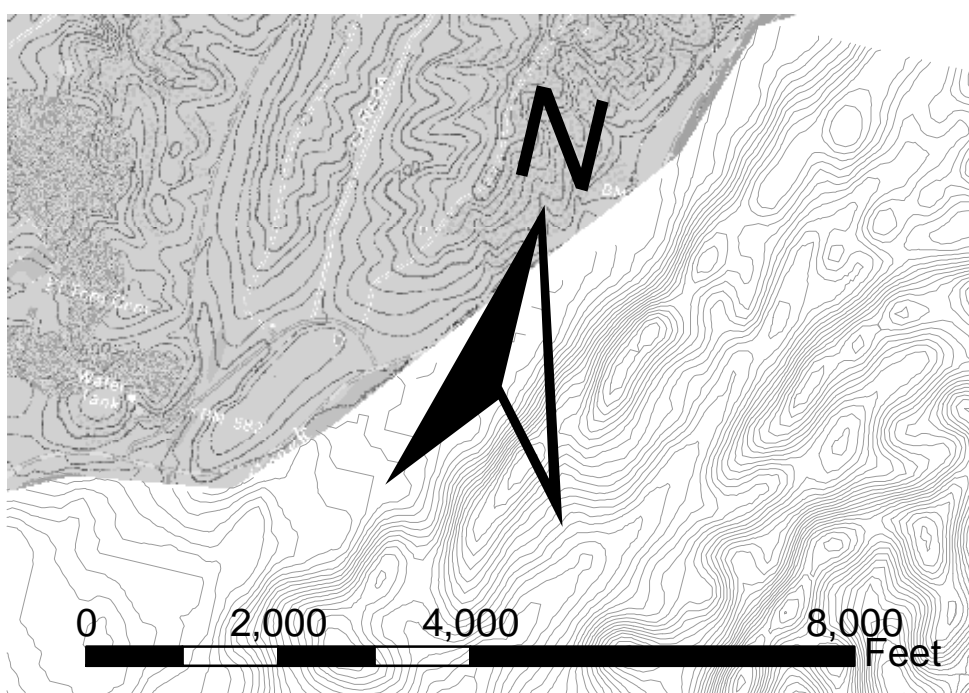




**Legend**

- 2000' CONTOUR
- FLOW LINE
- - - RANCHO MISSION VIEJO BOUNDARY

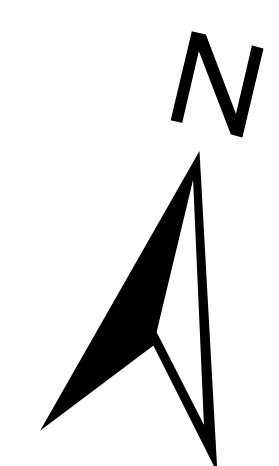




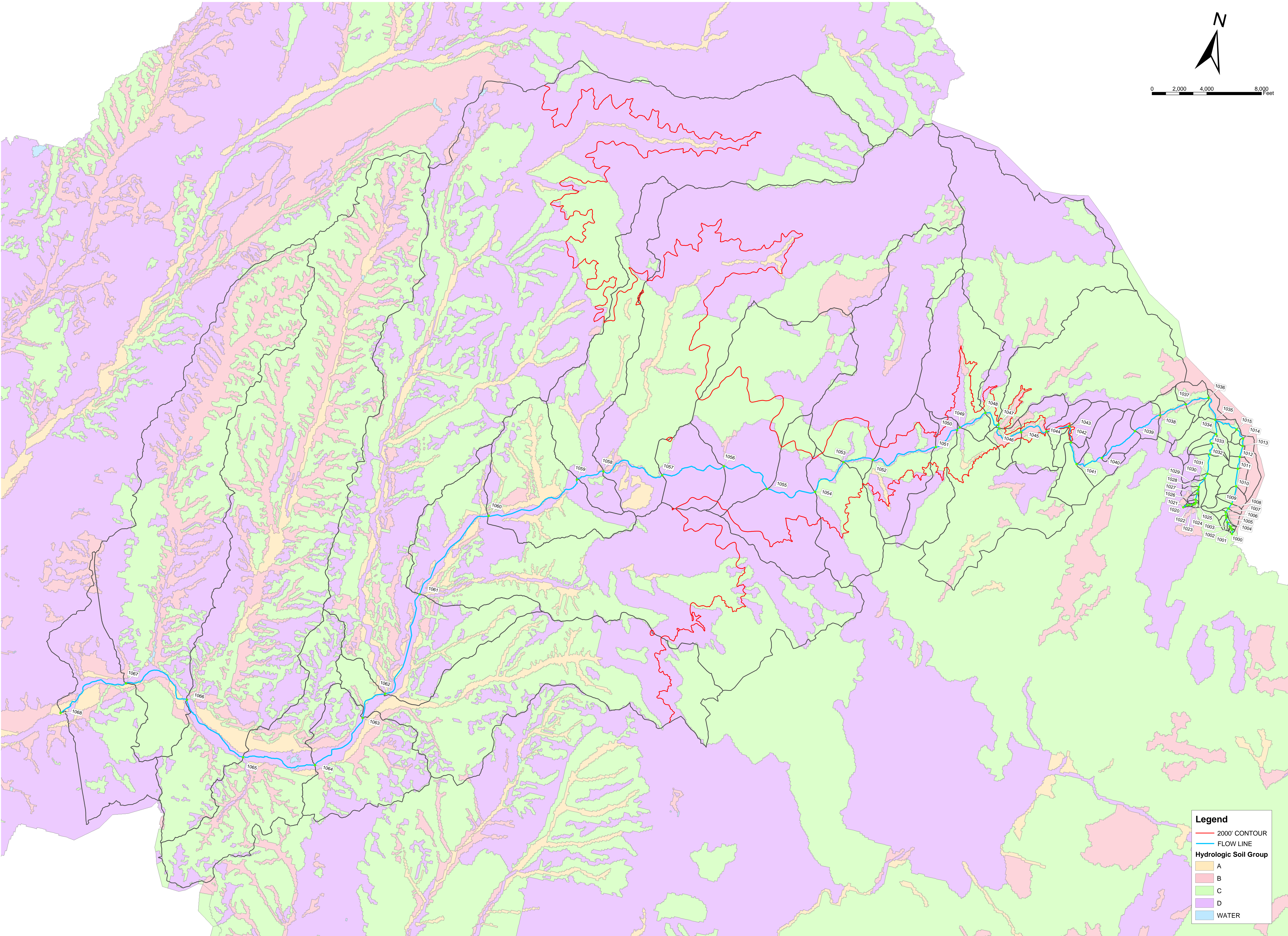
**Legend**

- 2000' CONTOUR
- FLOW LINE
- - - RANCHO MISSION VIEJO BOUNDARY





0 2,000 4,000 8,000 Feet



**Legend**

- 2000' CONTOUR
- FLOW LINE
- Hydrologic Soil Group**
- A
- B
- C
- D
- WATER