Drainage Study for the Otay Mesa Community Plan Update

April, 2007

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April, 2007

Chuck Spinks Exp. Date 03/31/08

R.C.E. 30894

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APPENDICES

I. BACKGROUND

This report has been prepared as an appendix to the Otay Mesa Community Plan update EIR. Its purpose is to provide a summary of the existing drainage situation and facilities and proposed future facilities, including alternatives for draining the large central watershed. In addition, this report presents recommendations for drainage design criteria and storm water quality requirements for each of the watersheds on the Mesa. A detailed pre-design report to be approved by the City of San Diego will be required before initiating the design.

For most of its early history, Otay Mesa was used for agriculture and farming was the primary land use. As industrial and commercial development started taking place in the 1960s, the City of San Diego recognized the need for a comprehensive drainage Master Plan for the Mesa. Because most of the Mesa drains to the South into Mexico, there was concern that the new development would increase the runoff crossing the border. The City needed to establish criteria for the new development such that there was no increase in runoff as a result of the new construction.

In May of 1987, the City Council approved a contract to prepare the Otay Mesa Drainage Master Plan. In August of 1987, the City published a Notice to "All Private Engineers" that established "Drainage Requirements for Development in Otay Mesa" (attached). The Master Plan was published in January, 1988, and included a proposed concrete Channel from Airway Road to Siempre Viva Road that followed the existing drainage channel.

The Master Plan was updated with the "Otay Mesa Drainage Study" published in August, 1999. The most significant recommendation change was moving the proposed new channel from the creek alignment to a new location directly adjacent to La Media Road and Siempre Viva Road. This report utilizes the hydrologic models and analyses prepared for the 1999 Master Plan.

Reproduction of 1987 NOTICE from Engineering and Development Department

NOTICE

Date: August 7, 1987

To: All Private Engineers

From: Subdivision Engineer

Subject: Drainage requirements for development in Otay Mesa

In order to minimize the effects of increased storm water runoff in Mexico, due to development of property in Otay Mesa, all property in Otay Mesa that is within the water shed that drains into Mexico, shall be developed with the following requirements:

1. Each property owner shall provide storm water detention facilities so that there will be no increase in the rate of runoff due to development of the property.

2. The detention facilities shall be designed so that the rate of runoff from the property will not be greater after development than it was before development for a 5 year, 10 year, 25 year and 50 year storm.

3. All drainage facilities crossing four-lane major or higher classification streets shall be designed for a Q100 (existing). Other facilities, except the major channel referred to in paragraph 5, may be designed for Q50 (existing).

4. The Drainage Design Manual shall be used as guidelines for design of drainage facilities and computing design discharges.

5. The City Engineer's Office, Flood Control Section, is preparing a preliminary plan for the main north-south channel from Otay Mesa Road near La Media to the Mexican Border. The preliminary design will include the design "Q" (Q100 existing), the invert grade, and the water surface elevation at the major road crossings.

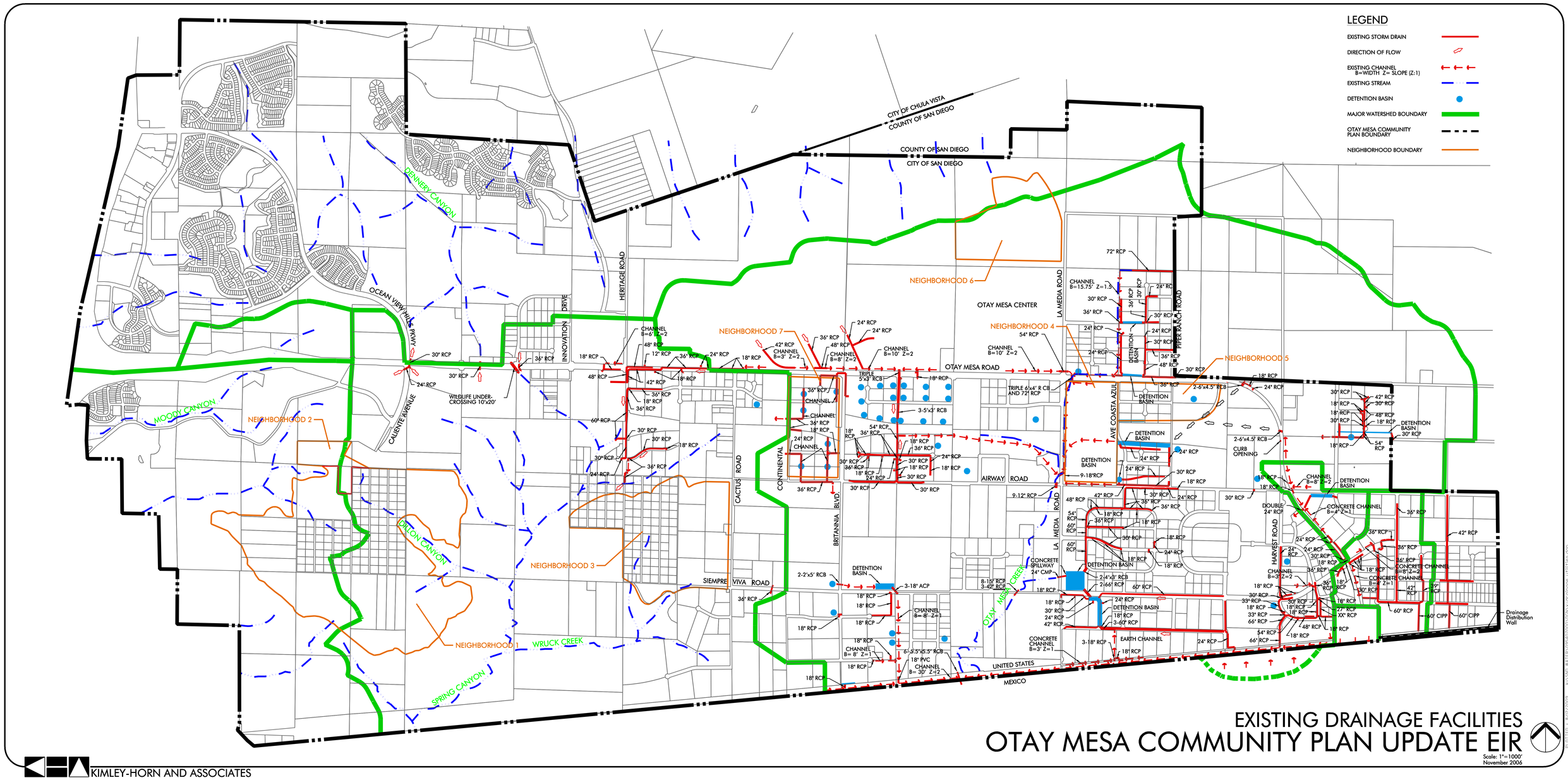
C.R. Lockhead
Subdivision Engineer

II. EXISTING DRAINAGE FACILITIES

Information was collected for existing drainage and flood control facilities on Otay Mesa through as-built plans, SanGIS maps, and site visits. Most of the existing drainage facilities were constructed as part of the private development that is taking place on the Mesa. Many of these facilities are not continuous because of the piecemeal nature of the development. This creates challenges for the subsequent developers that need to tie into the existing facilities. Many of the existing facilities are temporary. We were not able to obtain details on the drainage facilities in Mexico that receive most of the runoff.

Most of the development to-date has occurred in the East Watershed, which therefore includes most of the existing drainage facilities on the Mesa. The existing system is a combination of storm drains, improved channels, and detention basins, which in many areas discharge to natural drainage paths that do not have adequate hydraulic capacity.

The "Existing Drainage Facilities" drawing shows the facilities as-of the date of this report. The area is developing rapidly, and therefore new facilities are continuously being constructed. There are currently no dedicated drainage rights-of-way on the Mesa. Many of the projects, as they were mapped and constructed, dedicated portions of the properties to the city as drainage easements or flood water storage easements. Eventually, the systems and their easements will be continuous.


LEGEND
EXISTING STORM DRAIN
DIRECTION OF FLOW
EXISTING CHANNEL B=WIDTH Z= SLOPE (Z:1)
EXISTING STREAM
DETENTION BASIN
MAJOR WATERSHED BOUNDARY
OTAY MESA COMMUNITY PLAN BOUNDARY
NEIGHBORHOOD BOUNDARY
CITY OF CHULA VISTA
COUNTY OF SAN DIEGO
COUNTY OF SAN DIEGO
CITY OF SAN DIEGO
DENNERY CANYON
MOODY CANYON
DALEN CANYON
SPRING CANYON
WRUCK CREEK
OTAY MESA CREEK
NEIGHBORHOOD 1
NEIGHBORHOOD 2
NEIGHBORHOOD 3
NEIGHBORHOOD 4
NEIGHBORHOOD 5
NEIGHBORHOOD 6
NEIGHBORHOOD 7
OTAY MESA CENTER
OCEAN VIEW HILLS PKWY
HERITAGE ROAD
INNOVATION DRIVE
CALIENTE AVENUE
WILDLIFE UNDER-CROSSING 10'x20'
CACTUS ROAD
CONTINENTAL
BRITANNIA BLVD
SIEMPRE VIVA ROAD
OTAY MESA ROAD
AIRWAY ROAD
LA MEDIA ROAD
AVE COASTA AZUL
HARVEST ROAD
PIPER RANCH ROAD
UNITED STATES
MEXICO
Drainage Distribution Wall
EXISTING DRAINAGE FACILITIES
OTAY MESA COMMUNITY PLAN UPDATE EIR
Scale: 1"=1000'
November 2006
KIMLEY-HORN AND ASSOCIATES

III. HYDROLOGIC ANALYSIS

The Otay Mesa Study area is shown on the Watershed Map, and includes all of the Mesa area within the City of San Diego divided into five watersheds (with the exception of the far northwest arm of the Mesa, which is fully developed).

Watersheds	Acres	mi^2
West Perimeter Watershed	258	0.40
West Watershed	2,190	3.42
North Perimeter Watershed	590	0.92
East Watershed	3,864	6.04
Border Crossing Watershed	223	0.35
TOTAL	7,125	11.13

Most of the Mesa slopes from North to South, with the flow entering Mexico at several points. The northern and western perimeters of the Mesa flow into the adjacent Canyons. These perimeter watersheds are divided into several independent smaller watersheds. The watershed boundaries on the Mesa are not well defined because the Mesa is so flat. There are very few defined natural drainage paths, with much of the runoff sheet-flowing across the Mesa. The watershed boundaries shown are based on field investigations and best available mapping, but the actual drainage boundaries may be very different.

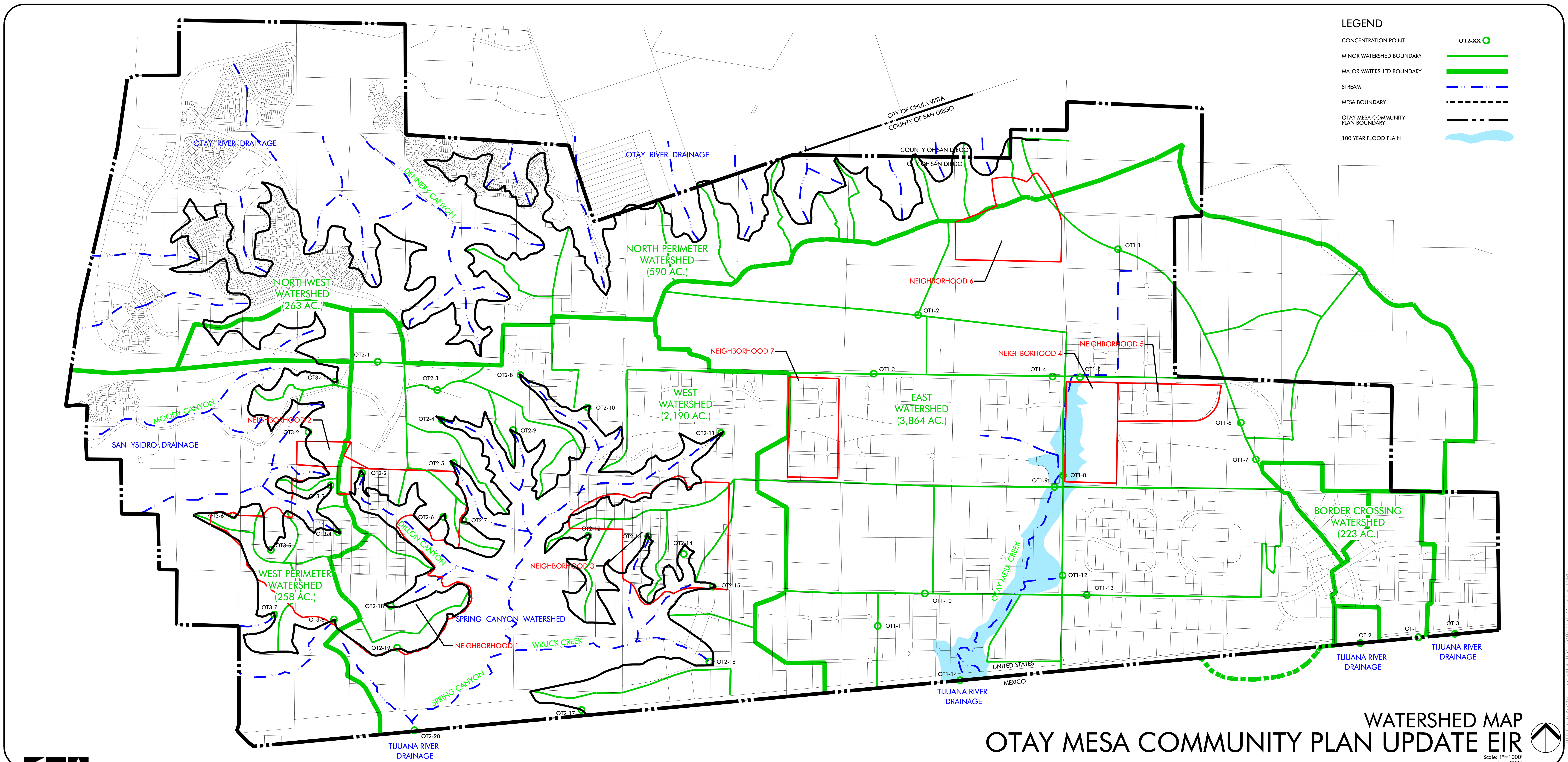
The only watershed that has been studied significantly from a drainage perspective is the East Watershed. Hydrologic models have been prepared for both of the previous drainage studies. The peak flows calculated in the two studies are different, primarily because of different assumptions relative to developed area, proposed drainage facilities, and watershed areas. The East Watershed includes a large area of unincorporated County property. The hydrologic model assumed the same industrial development for the unincorporated area. If land uses change in the County area, it may change the runoff rates. The differences for the concentration point at the border are shown below.

Q100 at Border East Watershed		
	Area (mi^2)	Q100(cfs)
1988 Study	5.72	5,050
1999 Study	6.63	3,529
2004 CPU	6.78	3,673

As part of this study, new hydrologic models have been prepared for the main watersheds which flow into the Tijuana River. For the East Watershed, HEC-1 has been used, since both previous studies used this model. For the other watersheds, the standard City of San Diego Modified Rational Method (AES) has been used. The results of these analyses are shown in the table below.

Hydrologic Analysis Summary			
	Area (mi^2)	Q50(cfs)	Q100(cfs)
West Perimeter Watershed	0.40	170	444
West Watershed	3.42	672	1,676
East Watershed	6.78	1,280	3,673
	10.60	2,122	5,793

In addition to the above flows, the Spring Canyon open space area contributes 109 cfs (Q50) and 257 cfs (Q100) from 1.2 mi^2. Since the Tijuana River Watershed is a water-quality impacted watershed, the quality and quantity of flow will need to be addressed before additional development takes place.



KIMLEY-HORN AND ASSOCIATES

WATERSHED	CONCENTRATION POINT	AREA (ACRES)	Q_{50}	Q_{100}
WEST PERIMITER	OT3-1	19.4	18.3	51.4
	OT3-1A	14.8	12.0	32.1
	OT3-2	47.1	26.7	67.3
	OT3-3	11.8	10.6	29.3
	OT3-4	35.0	22.4	57.5
	OT3-5	16.5	13.3	35.8
	OT3-6	12.2	10.9	30.3
	OT3-7	46.1	27.7	70.4
	OT3-8	51.4	27.7	69.4
		254.3	**169.5**	**443.5**
WEST	OT2-1	33.3	17.1	42.6
	OT2-2	126.2	41.4	99.5
	OT2-18	97.1	47.7	118.2
	OT2-19	27.7	22.3	60.1
	OT2-3	20.1	14.6	38.4
	OT2-4	67.8	38.5	96.9
	OT2-5	40.8	20.1	49.7
	OT2-6	34.8	17.1	42.4
	OT2-7	14.9	17.9	43.2
	OT2-8	81.3	43.0	108.7
	OT2-9	36.9	23.6	60.6
	OT2-9A	12.9	11.5	31.8
	OT2-10	128.4	43.1	103.8
	OT2-11	275.6	112.2	279.9
	OT2-12	23.6	17.5	46.0
	OT2-13	61.5	42.1	109.3
	OT2-14	48.4	26.1	65.3
	OT2-15	153.8	57.2	138.8
	OT2-16	121.7	40.8	98.4
	OT2-17	60.3	17.8	42.5
		1467.1	**671.6**	**1676.1**
MEXICO	Canyon Area	**774.8**	**109.3**	**257:0**

May 23, 2005

IV. HYDRAULIC ANALYSIS

Most of the Mesa is very flat, resulting in local flooding during storms at the low points and along some drainage ditches. The only significant creek on the Mesa is the main channel in the East Watershed, Otay Mesa Creek, which flows from North to South along La Media Road and crosses the border into Mexico just north of the Tijuana Airport.

A HEC-RAS hydraulic model was prepared for this channel from the border north to Otay Mesa Road. The purpose of this model was to identify the 100-year floodplain for this reach for present conditions. The proposed future drainage project along this alignment will be designed to contain the 100-year flow, reducing or eliminating flooding impacts to adjacent properties.

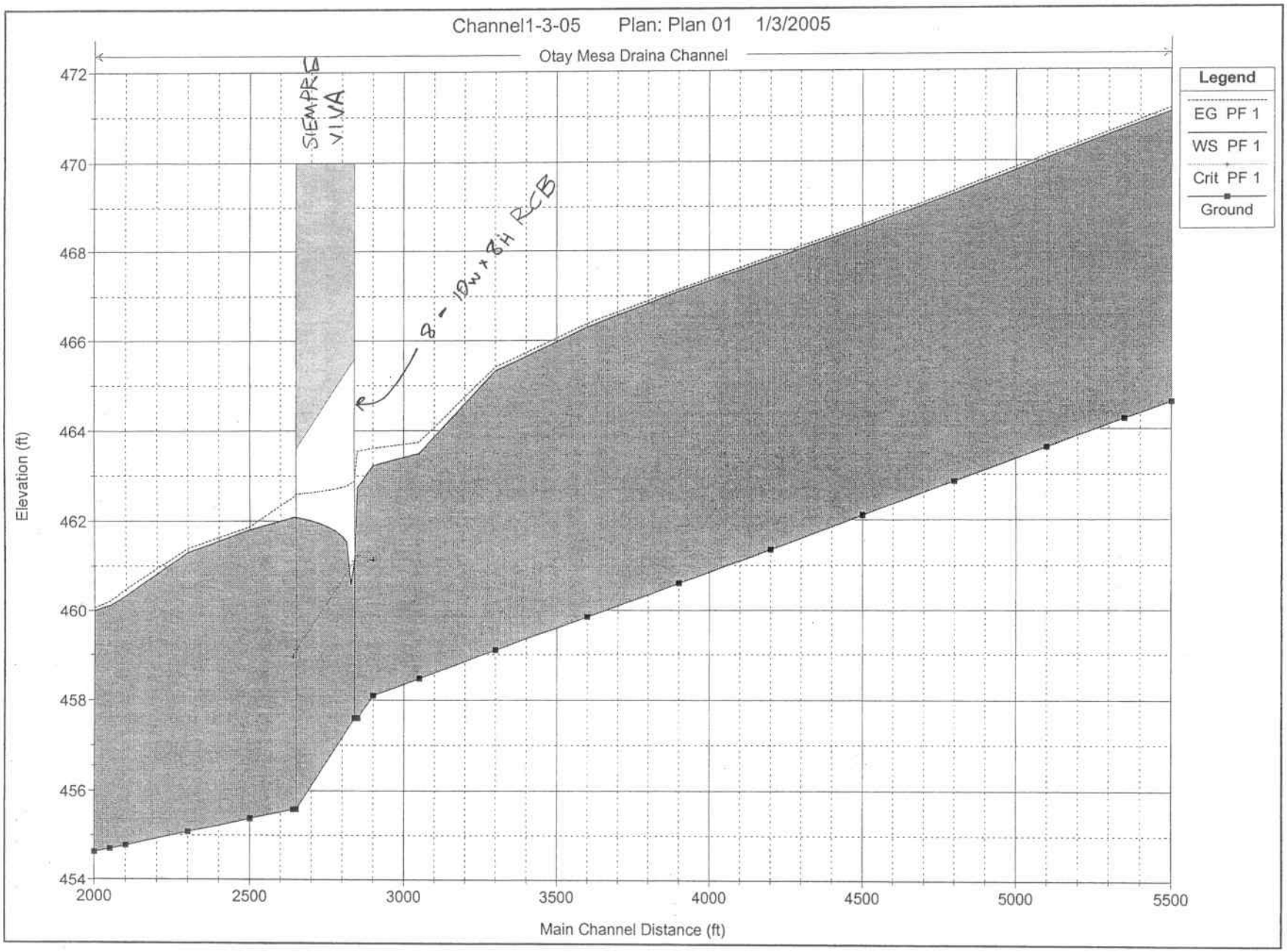
The HEC-RAS model was also used to size the proposed new channel from Airway Road to just south of Siempre Viva Road. Several alternative cross-sections were modeled to reflect input on the environmental aspects of the channel.

A significant tributary to the main channel enters just upstream of the Siempre Viva Road crossing. This tributary conveys flow from the De La Fuente Business Park and the Siempre Viva Business Park. The existing channel from La Media Road to the proposed main channel is approximately 15 feet wide and 4 feet deep, with a hydraulic capacity of approximately 120 cfs. The 100 year flow in this channel is 1116 cfs. A proposed new channel has a 50 ft bottom width with 1.5:1.0 side slopes and will convey the 100 year flow. A double 10' x 4.5' RCB will also be required for the flow under La Media Road. The cost estimate does not include these facilities.

OTAY MESA CPU 1-4-05

HEC-RAS Plan: Plan 01 River: Otay Mesa Draina Reach: Channel Profile: PF 1

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Channel	5500	PF 1	2500.00	464.60	471.08		471.16	0.002743	2.33	1073.59	200.00	0.18
Channel	5350	PF 1	2500.00	464.23	470.69		470.76	0.002572	2.16	1279.19	335.44	0.17
Channel	5100	PF 1	2500.00	463.60	470.06		470.12	0.002591	2.17	1275.99	335.16	0.17
Channel	4800	PF 1	2500.00	462.85	469.27		469.33	0.002666	2.19	1263.56	334.04	0.18
Channel	4500	PF 1	2500.00	462.10	468.51		468.56	0.002430	2.08	1358.84	378.24	0.17
Channel	4200	PF 1	2500.00	461.35	467.79		467.85	0.002365	2.07	1371.79	379.61	0.17
Channel	3900	PF 1	2500.00	460.60	467.09		467.15	0.002266	2.04	1392.50	381.79	0.16
Channel	3600	PF 1	2500.00	459.85	466.30		466.37	0.002969	2.32	1153.04	281.59	0.19
Channel	3300	PF 1	2500.00	459.10	465.33		465.42	0.003423	2.41	1109.99	285.62	0.20
Channel	3050	PF 1	3000.00	458.48	463.50		463.74	0.014532	4.06	777.90	261.33	0.39
Channel	2900	PF 1	3000.00	458.10	463.23	461.14	463.61	0.000245	4.97	603.31	222.92	0.41
Channel	2850	PF 1	3000.00	457.60	462.74	461.24	463.55	0.000521	7.22	415.32	168.05	0.58
Channel	2750		Culvert									
Channel	2640	PF 1	3000.00	455.59	462.07	458.95	462.52	0.011957	5.38	557.46	183.64	0.37
Channel	2500	PF 1	3000.00	455.38	461.81		461.87	0.001846	2.07	1492.22	277.64	0.15
Channel	2300	PF 1	3000.00	455.08	461.31		461.40	0.003272	2.45	1261.91	277.98	0.19
Channel	2100	PF 1	3000.00	454.78	460.34		460.48	0.006864	3.05	1006.36	275.43	0.27
Channel	2050	PF 1	3000.00	454.70	460.11		460.21	0.003838	2.56	1191.75	275.37	0.21
Channel	2000	PF 1	3000.00	454.63	460.00	456.55	460.06	0.002196	2.06	1582.39	378.00	0.16


Channel1-3-05 Plan: Plan 01 1/3/2005
Otay Mesa Draina Channel
SIEMPRE VIVA
Q = 18W x 8H RCB
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Elevation (ft)
472
470
468
466
464
462
460
458
456
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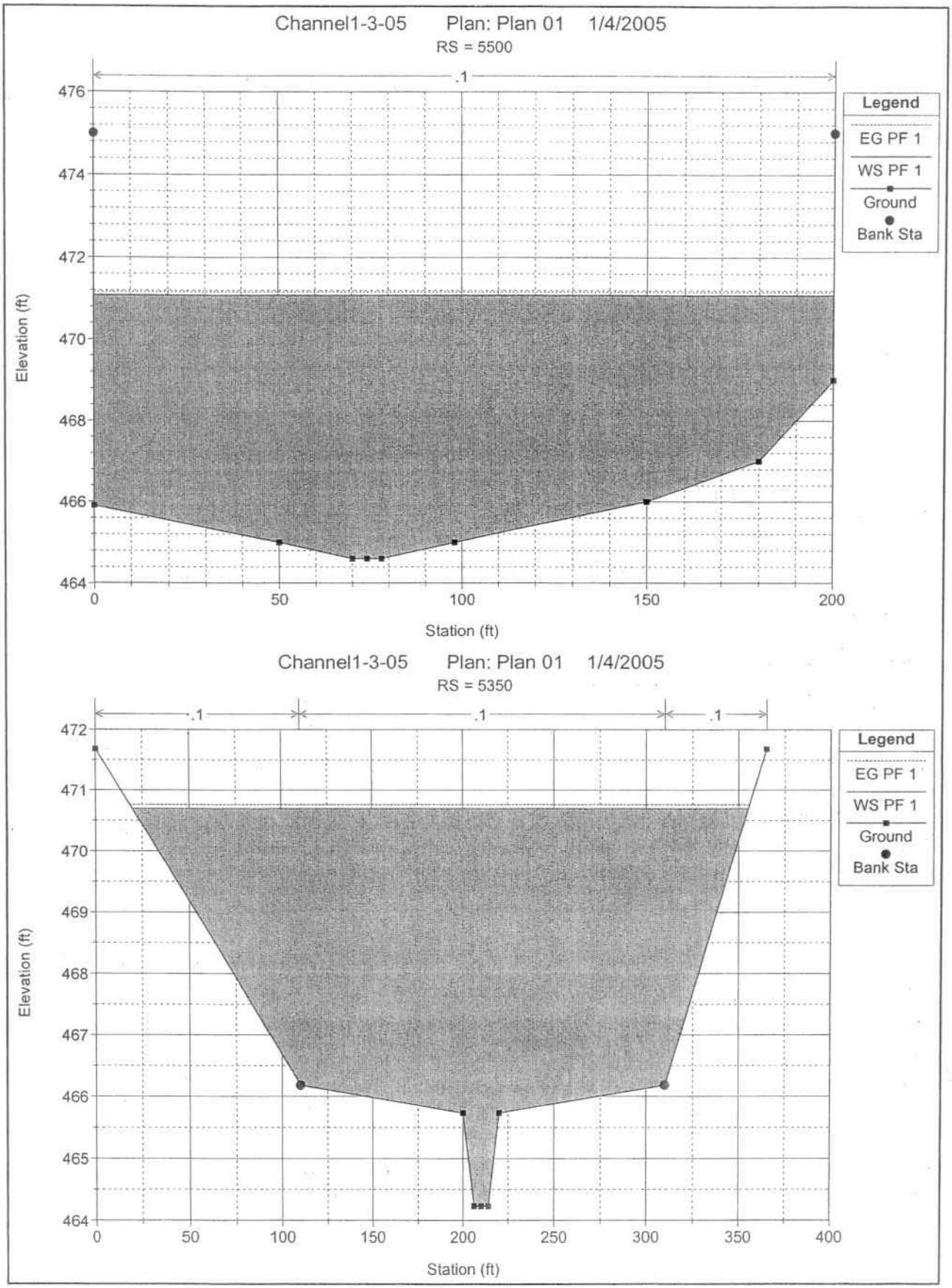
2000
2500
3000
3500
4000
4500
5000
5500
Main Channel Distance (ft)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Ground
Bank Sta
Elevation (ft)
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470
468
466
464
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100
150
200
Station (ft)
Channel1-3-05 Plan: Plan 01 1/4/2005
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.1
Legend
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WS PF 1
Ground
Bank Sta
Elevation (ft)
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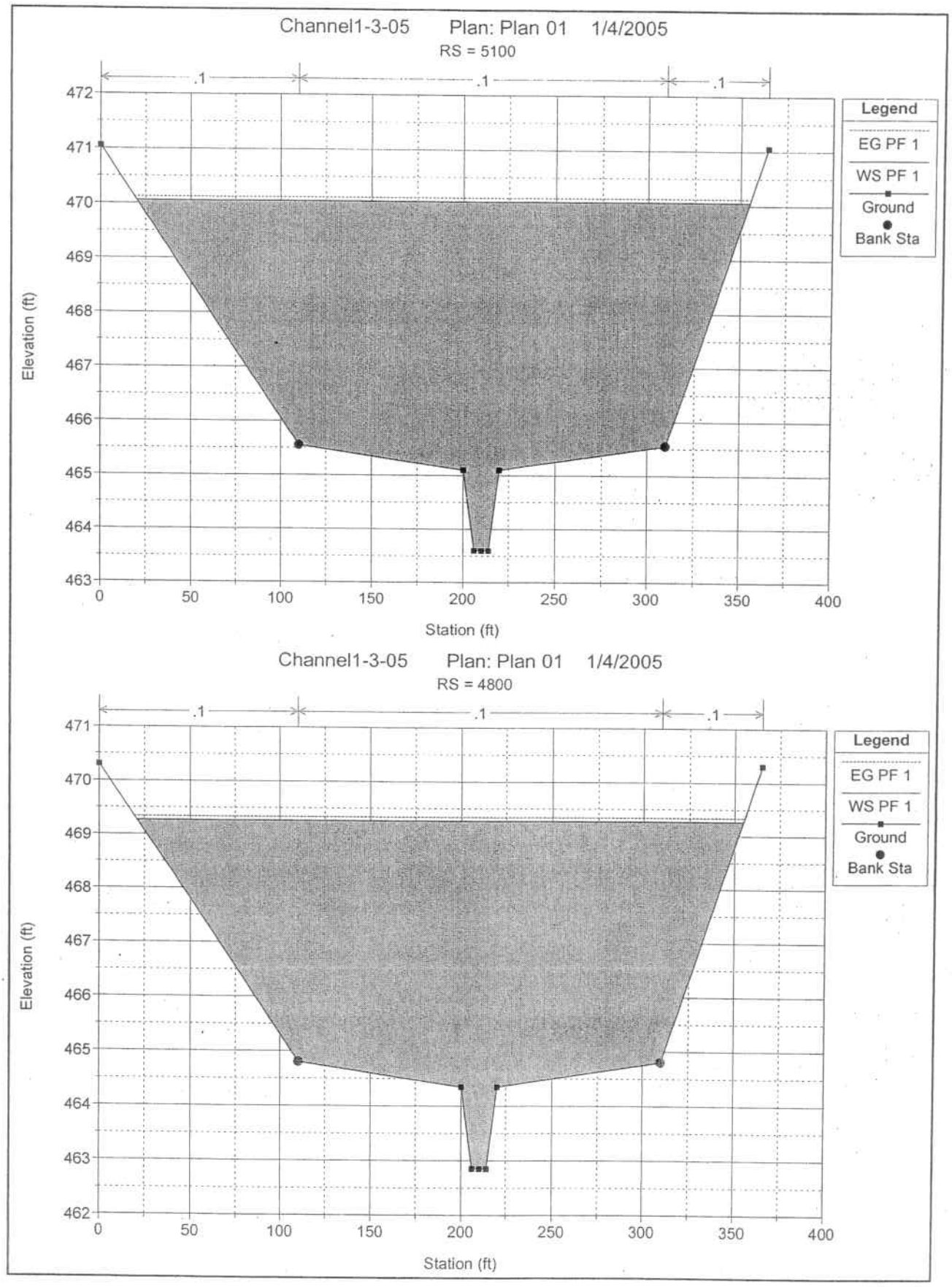
300
350
400
Station (ft)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Elevation (ft)
Station (ft)
Channel1-3-05 Plan: Plan 01 1/4/2005
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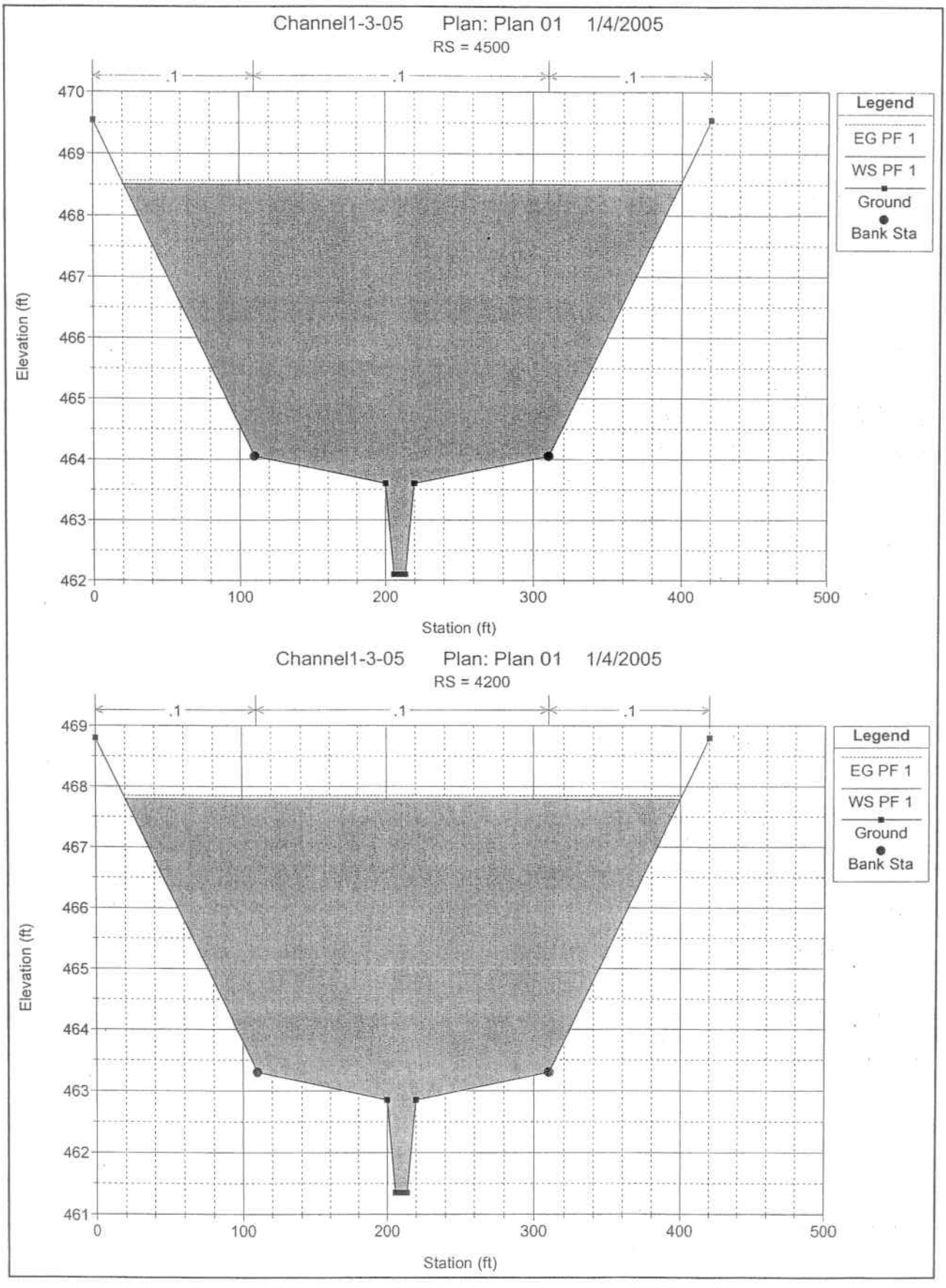
Bank Sta
Elevation (ft)
Station (ft)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Bank Sta
Elevation (ft)
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469
468
467
466
465
464
463
462
0
100
200
300
400
500
Station (ft)
Channel1-3-05 Plan: Plan 01 1/4/2005
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Legend
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WS PF 1
Ground
Bank Sta
Elevation (ft)
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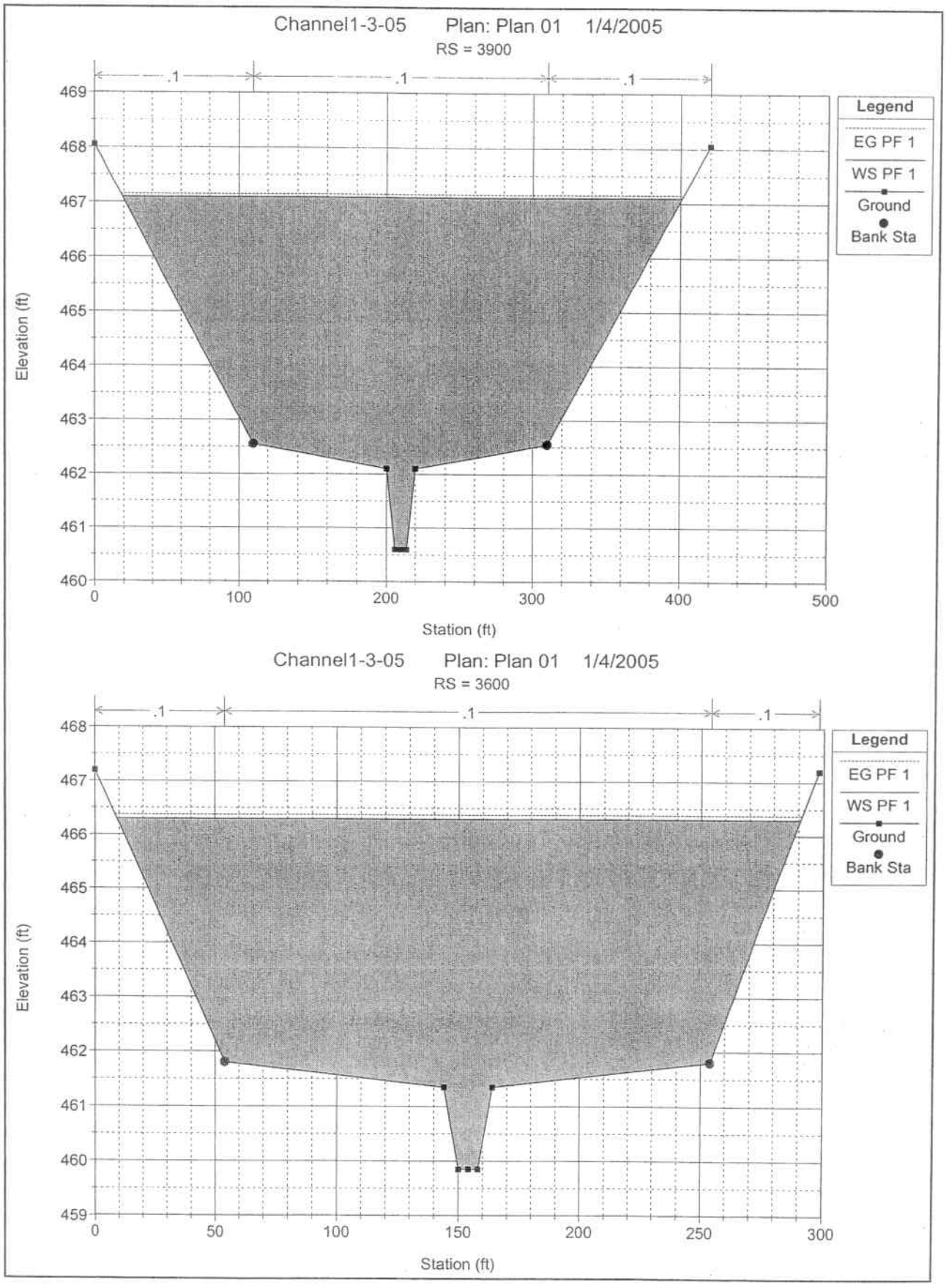
Station (ft)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Elevation (ft)
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400
500
Station (ft)
Legend
EG PF 1
WS PF 1
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Bank Sta
Channel1-3-05 Plan: Plan 01 1/4/2005
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466
465
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462
461
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Elevation (ft)
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Station (ft)
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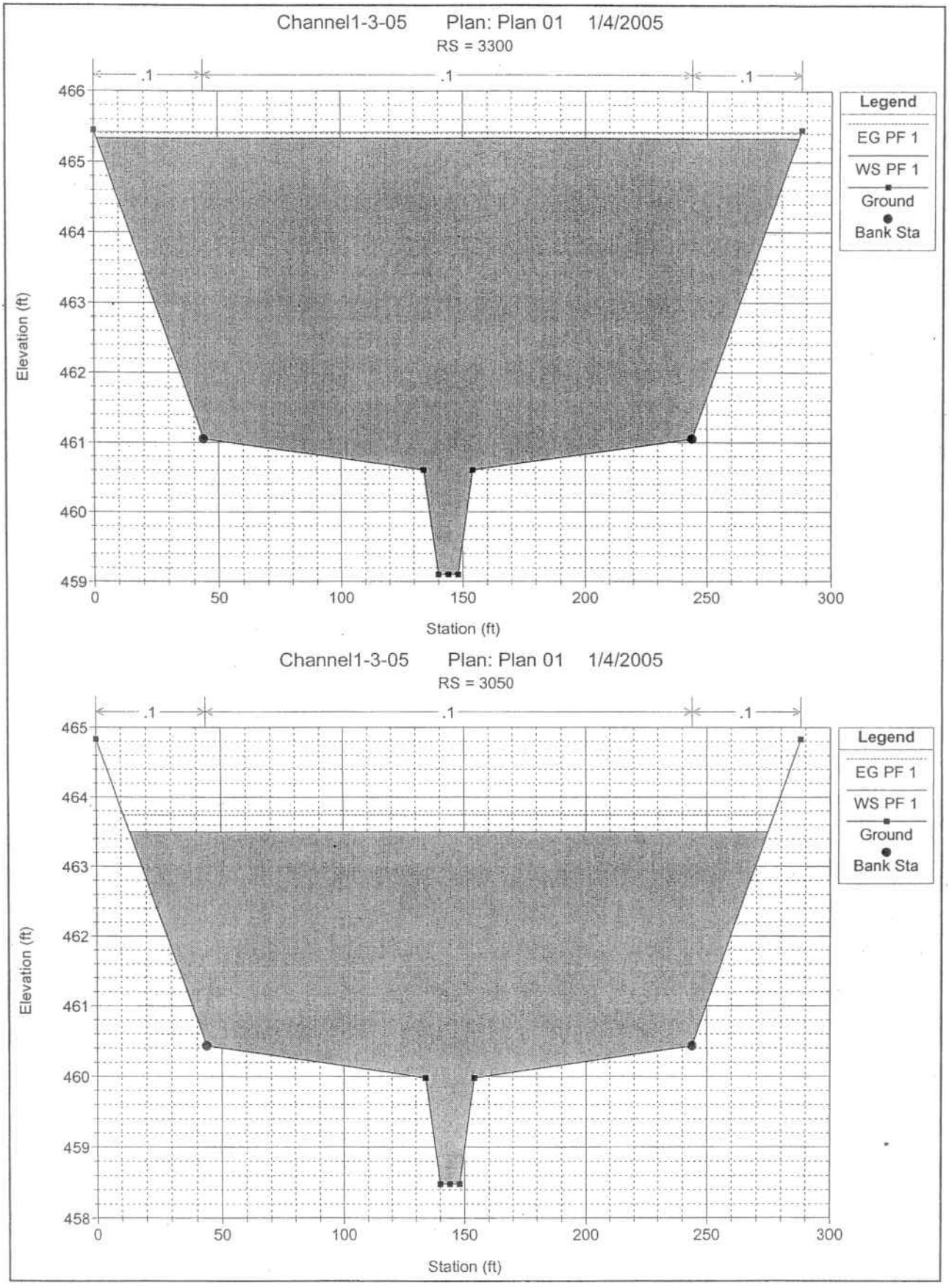
Bank Sta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Elevation (ft)
466
465
464
463
462
461
460
459
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50
100
150
200
250
300
Station (ft)
Channel1-3-05 Plan: Plan 01 1/4/2005
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.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
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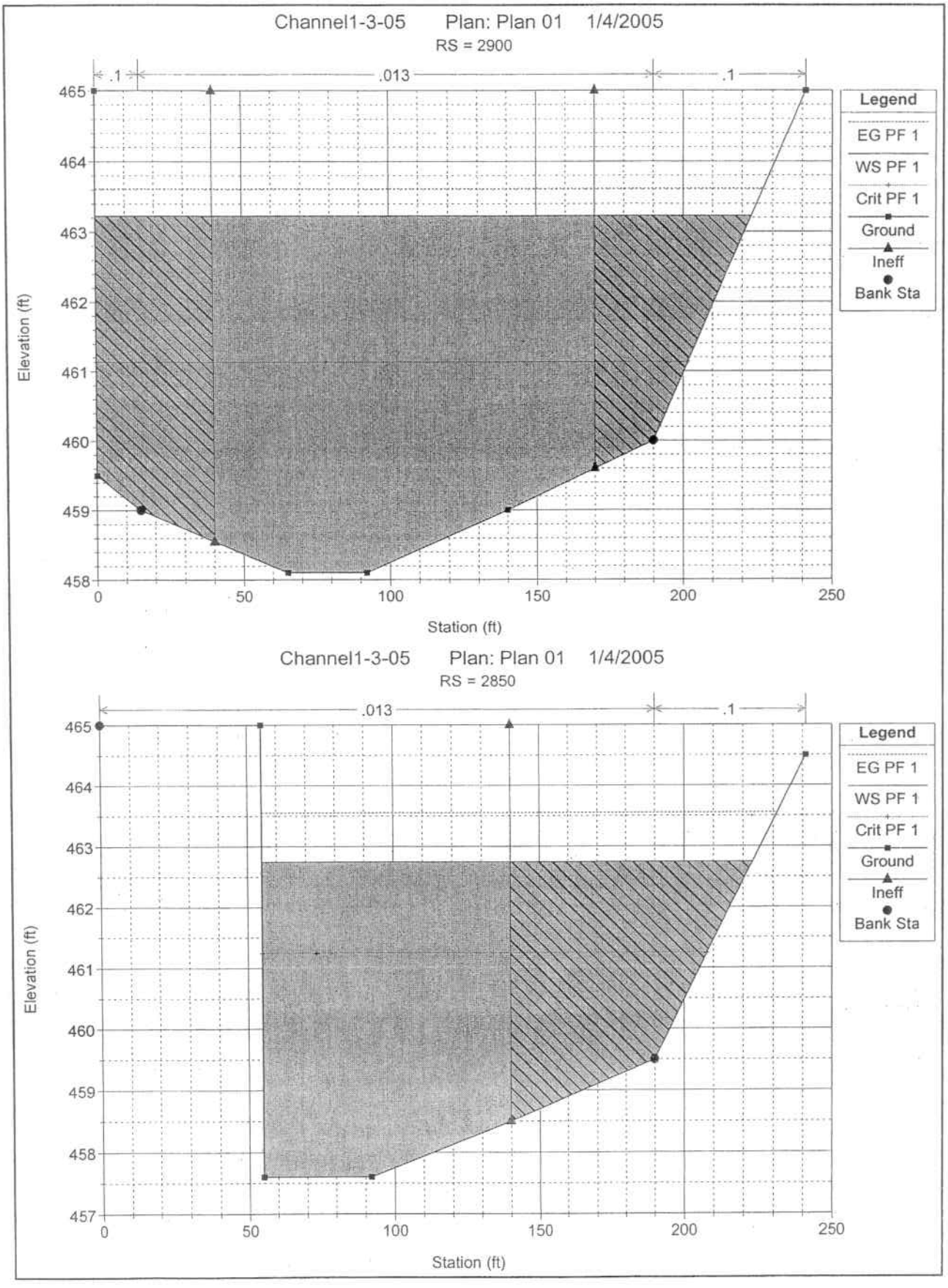
250
300
Station (ft)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Crit PF 1
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Ineff
Bank Sta
Elevation (ft)
Station (ft)
Channel1-3-05 Plan: Plan 01 1/4/2005
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.1
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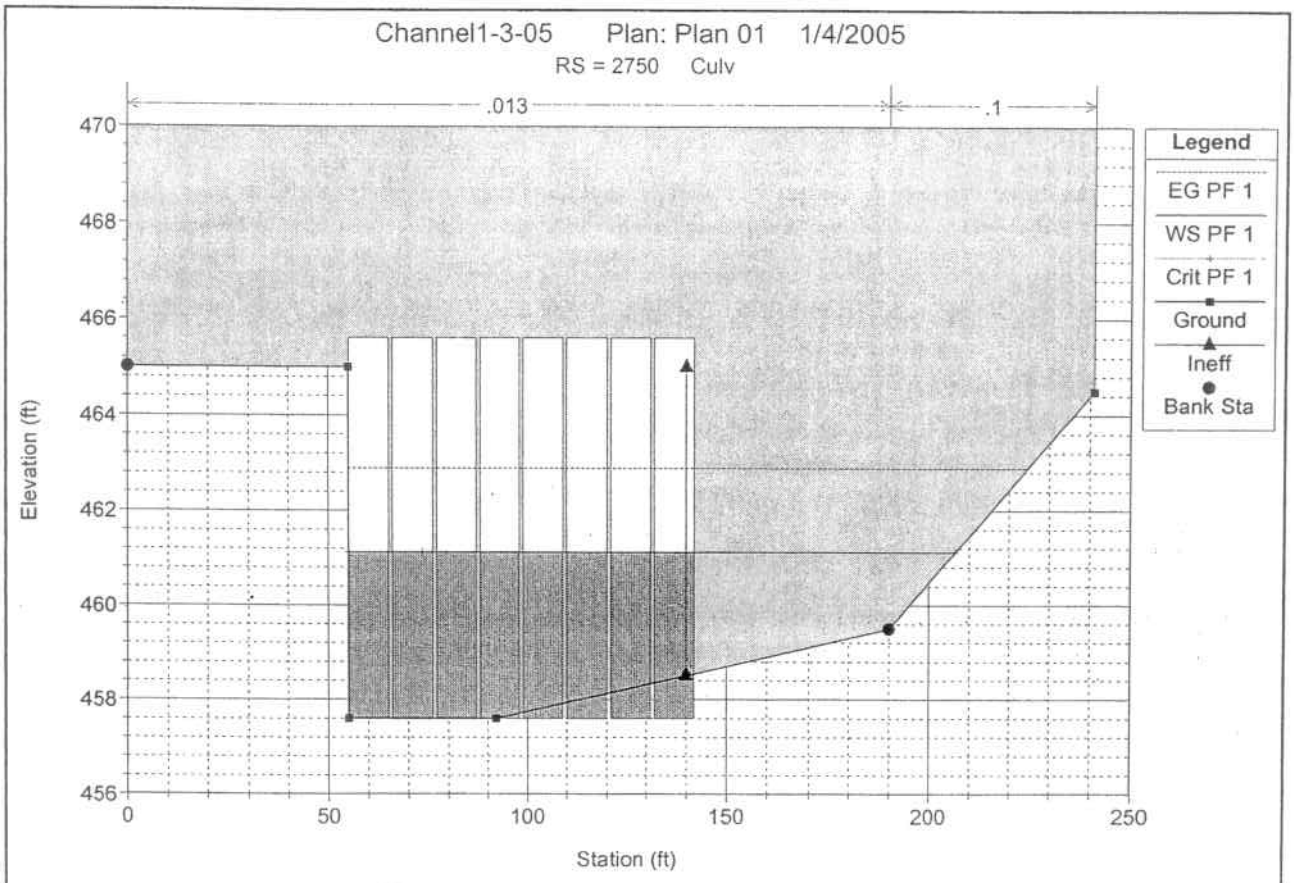
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)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Legend
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WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Elevation (ft)
Station (ft)
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464
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460
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456
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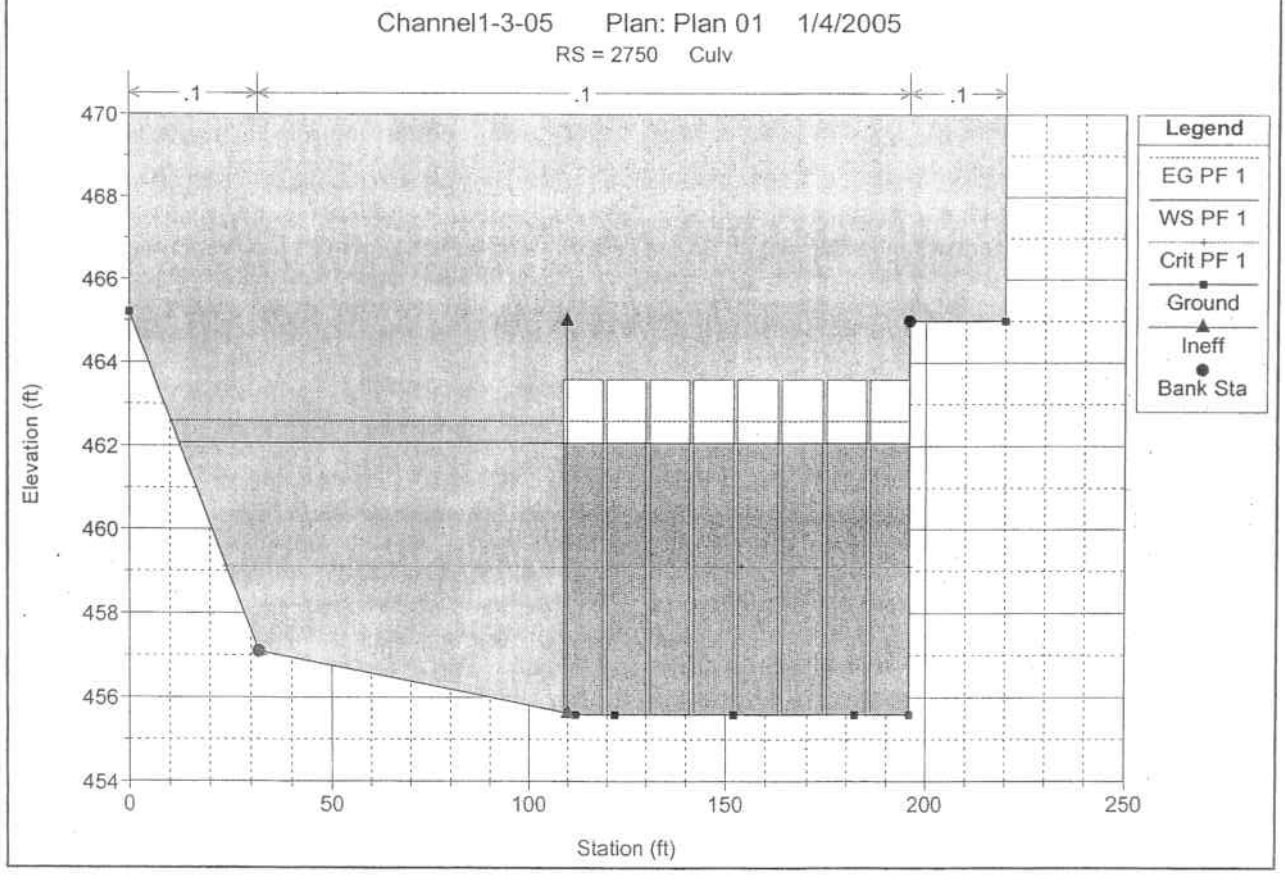
100
150
200
250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Bank Sta
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200
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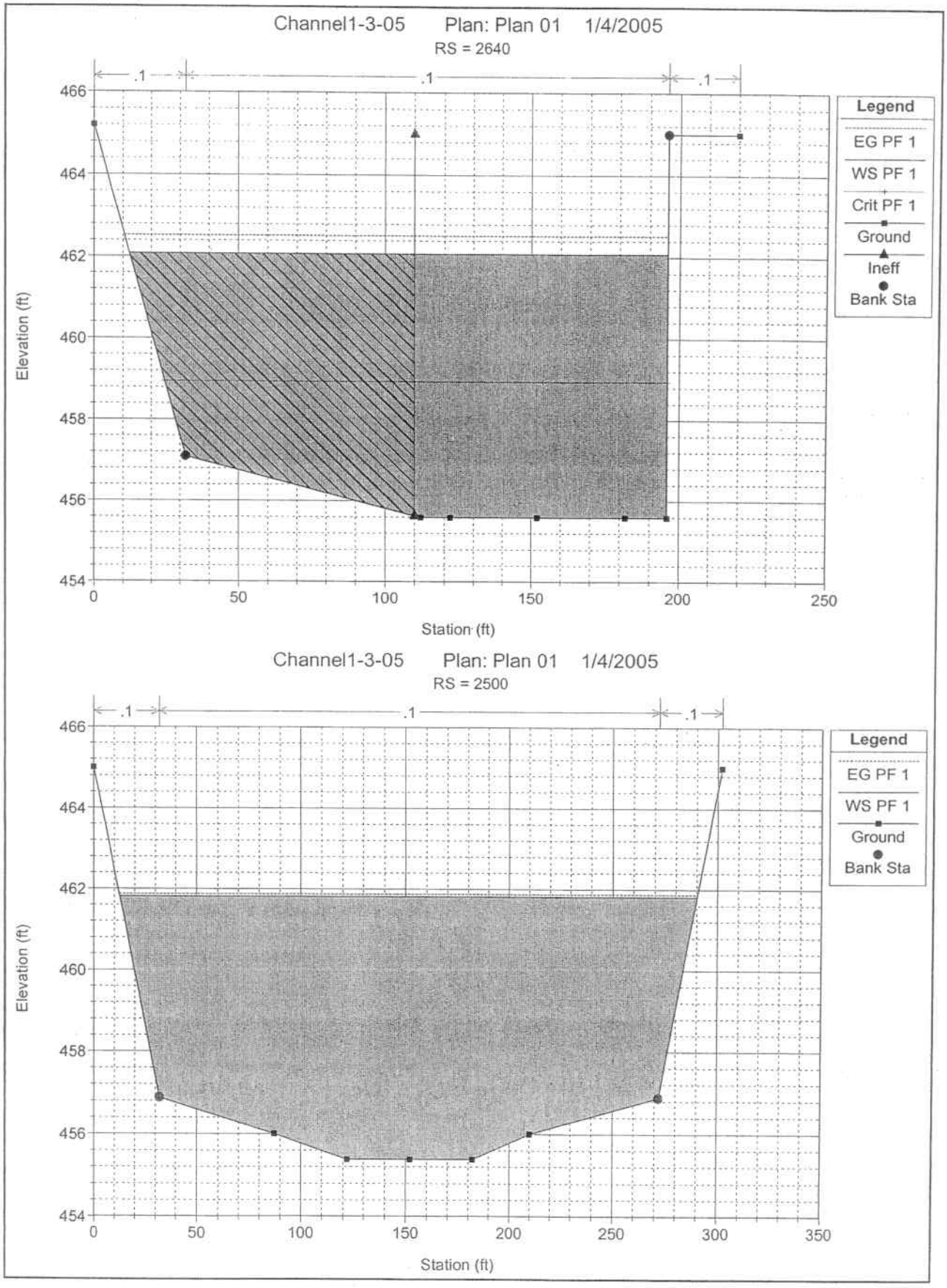
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100
150
200
250
Station (ft)
Legend
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WS PF 1
Crit PF 1
Ground
Ineff
Bank Sta
Channel1-3-05 Plan: Plan 01 1/4/2005
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.1
.1
466
464
462
460
458
456
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Elevation (ft)
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350
Station (ft)
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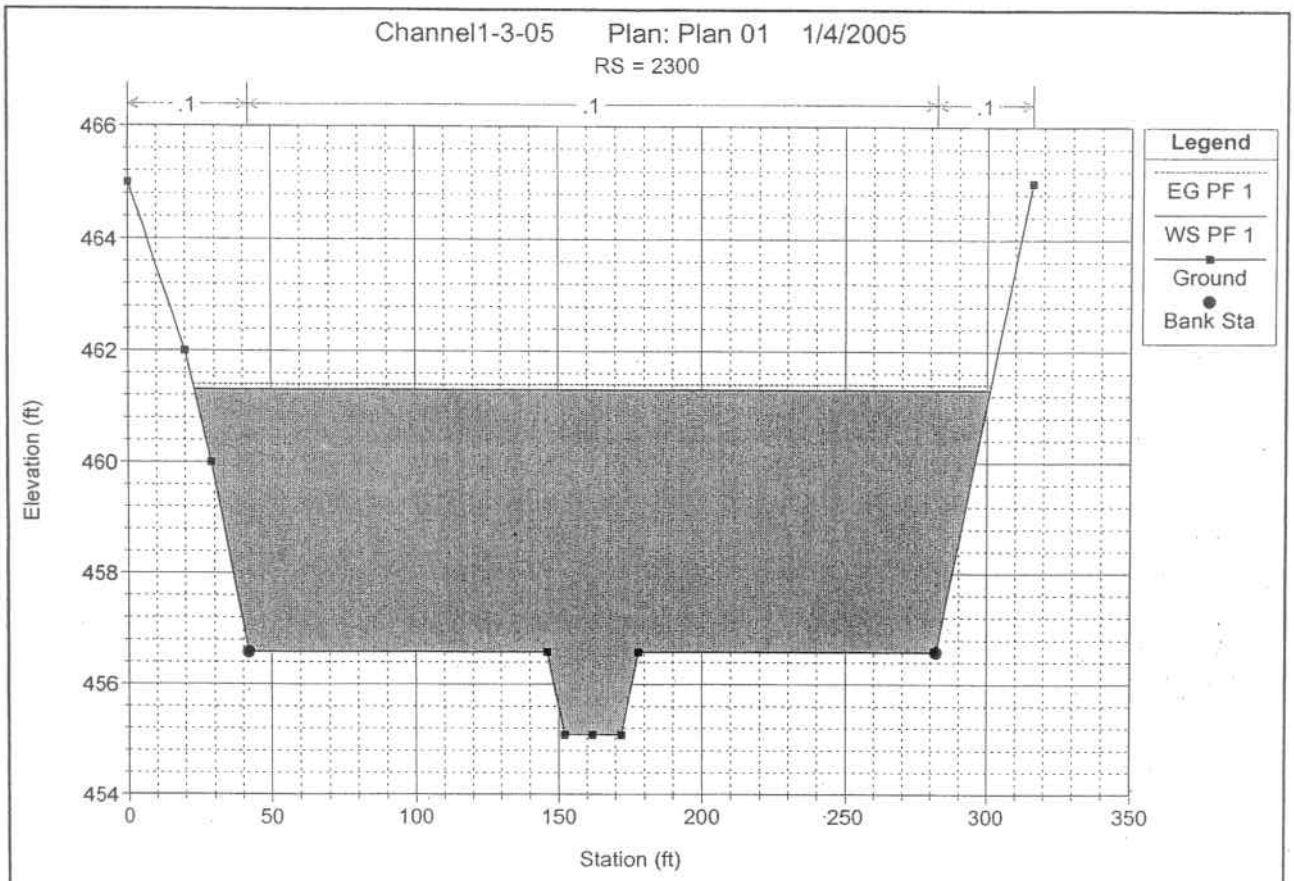
WS PF 1
Ground
Bank Sta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Bank Sta
Elevation (ft)
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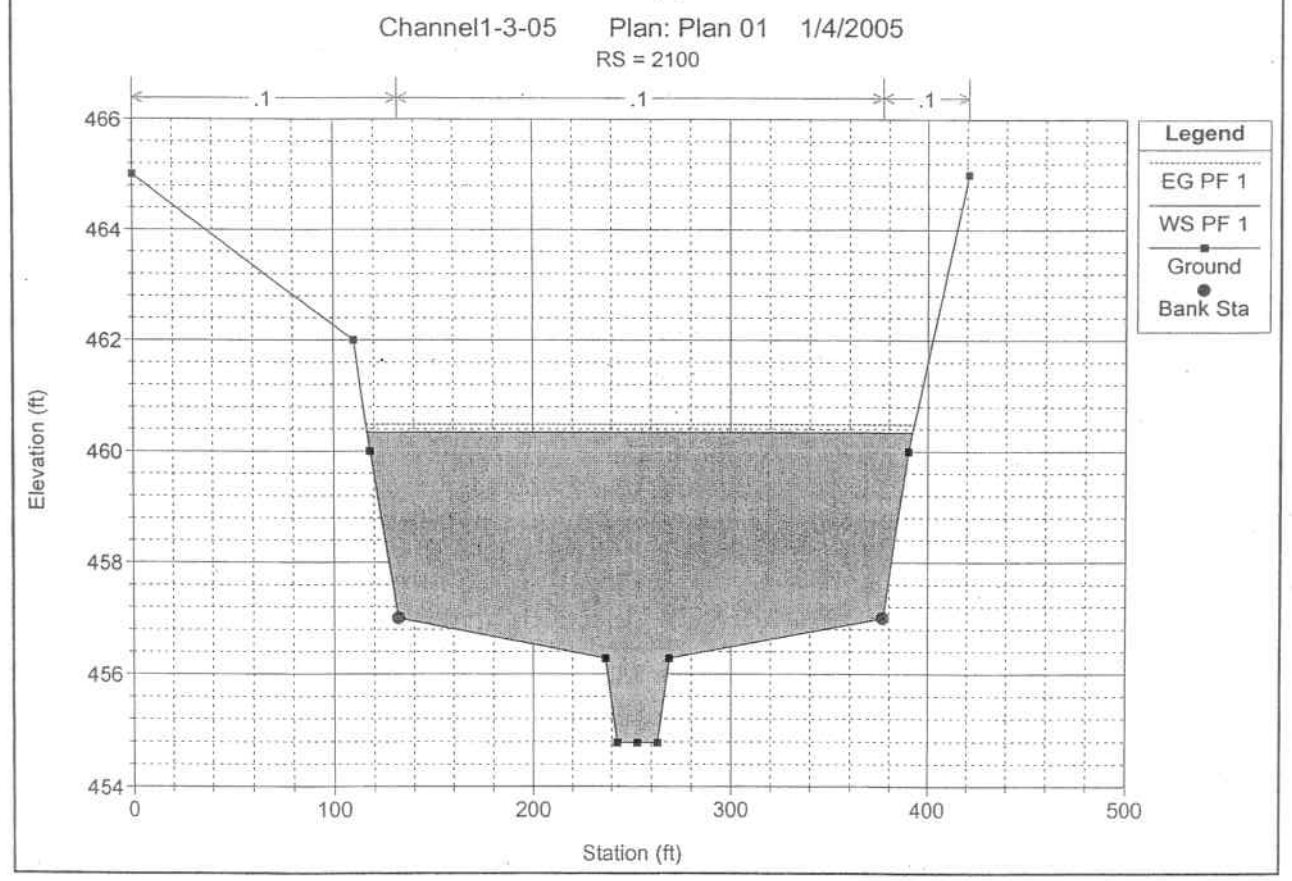
100
150
200
250
300
350
Station (ft)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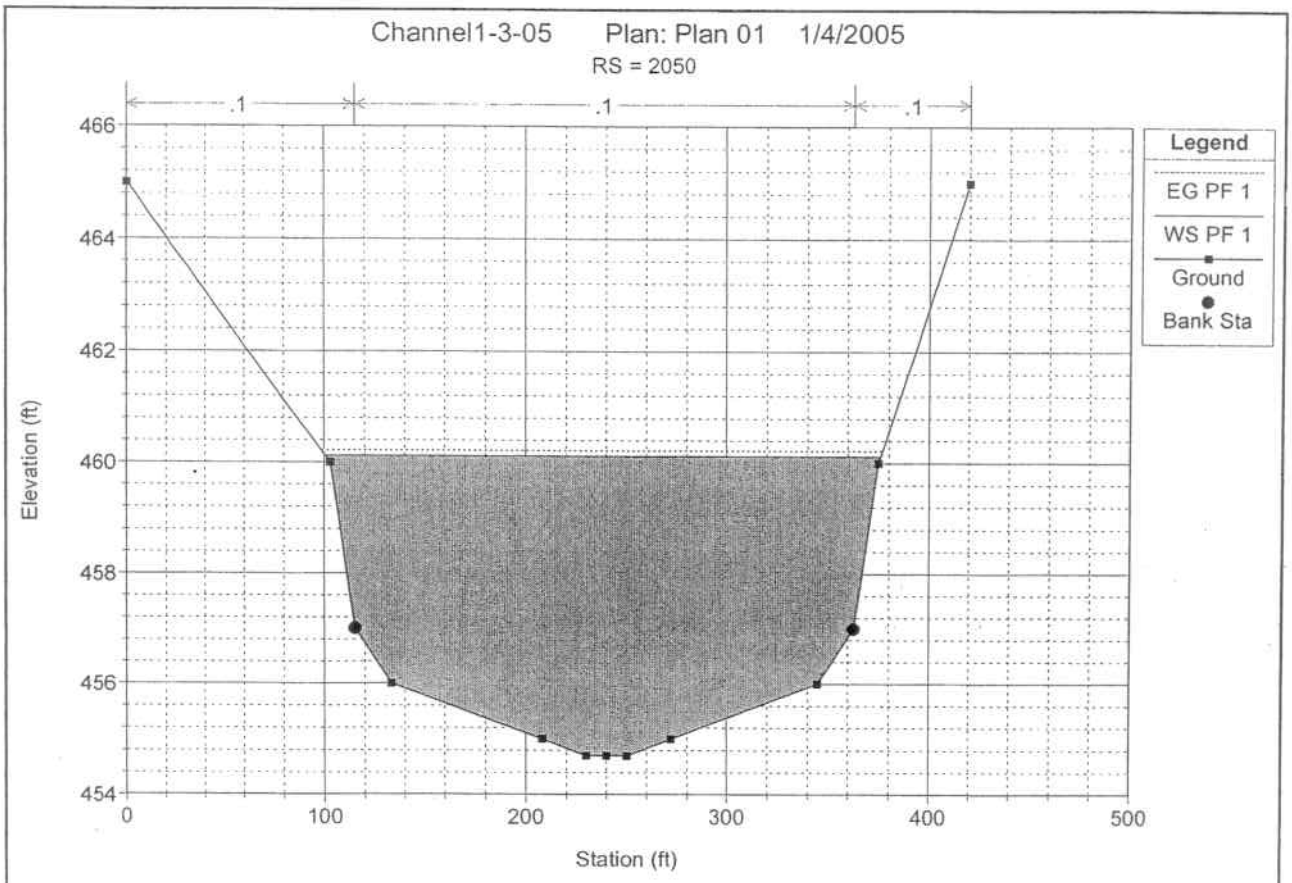
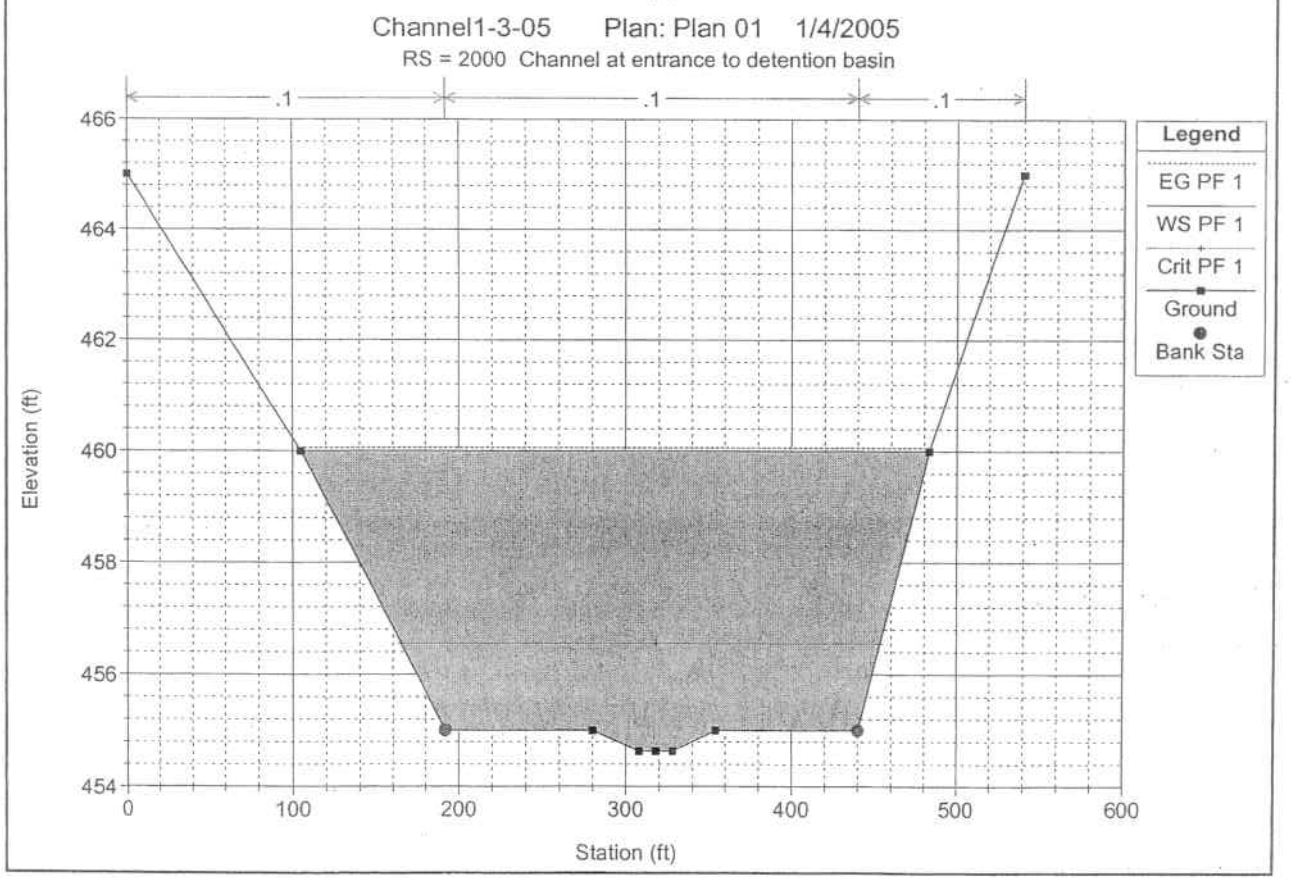
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
466
464
462
460
458
456
454
0
100
200
300
400
500
Station (ft)


Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2050
.1
.1
.1
Legend
EG PF 1
WS PF 1
Ground
Bank Sta
Elevation (ft)
466
464
462
460
458
456
454
0
100
200
300
400
500
Station (ft)


Channel1-3-05 Plan: Plan 01 1/4/2005
RS = 2000 Channel at entrance to detention basin
.1
.1
.1
Legend
EG PF 1
WS PF 1
Crit PF 1
Ground
Bank Sta
Elevation (ft)
466
464
462
460
458
456
454
0
100
200
300
400
500
600
Station (ft)

Worksheet
Worksheet for Trapezoidal Channel

Project Description	
Worksheet	Trapezoidal Channel - 1
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

Input Data		
Mannings Coefficient	0.045	
Slope	0.006150	ft/ft
Depth	4.00	ft
Left Side Slope	1.50	H : V
Right Side Slope	1.50	H : V
Bottom Width	50.00	ft

Results		
Discharge	1,331.30	cfs
Flow Area	224.0	ft²
Wetted Perimeter	64.42	ft
Top Width	62.00	ft
Critical Depth	2.73	ft
Critical Slope	0.022466	ft/ft
Velocity	5.94	ft/s
Velocity Head	0.55	ft
Specific Energy	4.55	ft
Froude Number	0.55	
Flow Type	Subcritical	

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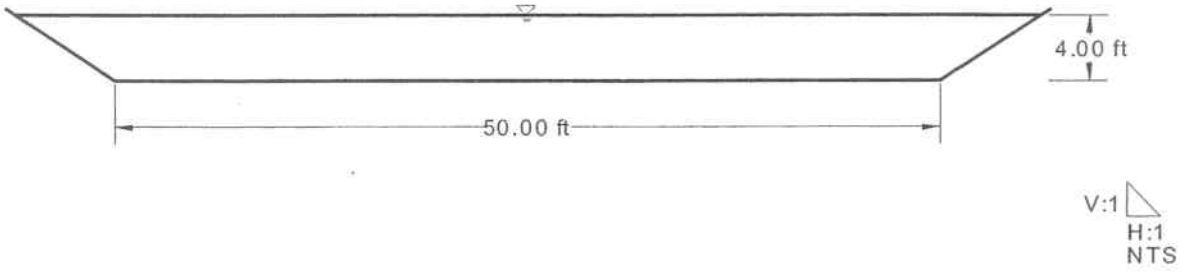
37 Brookside Road Waterbury, CT 06708 USA (203) 755-1666

Cross Section
Cross Section for Trapezoidal Channel

Project Description	
Worksheet	Trapezoidal Channel - 1
Flow Element	Trapezoidal Channel
Method	Manning's Formula
Solve For	Discharge

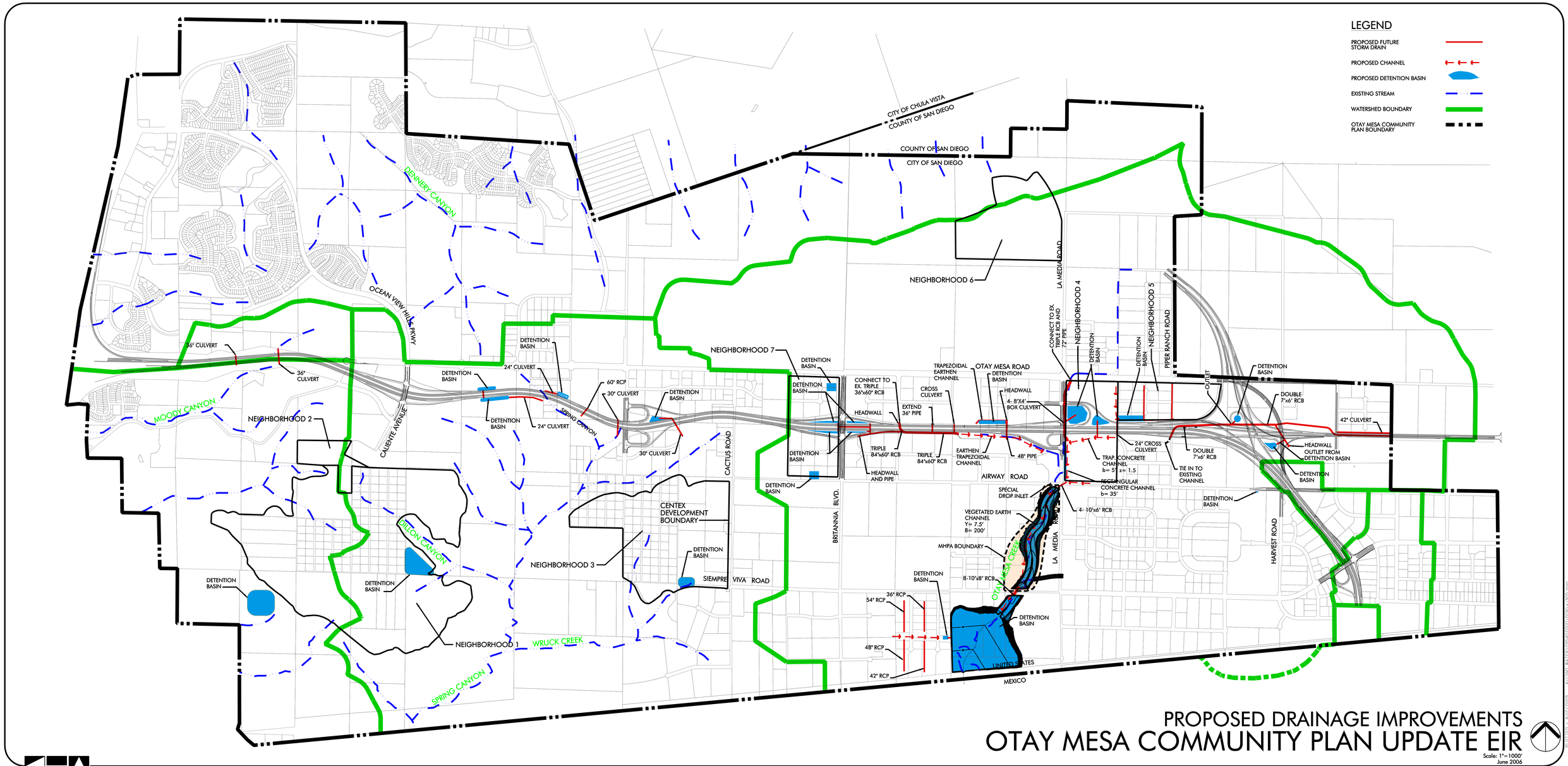
Section Data		
Mannings Coefficient	0.045	
Slope	0.006150	ft/ft
Depth	4.00	ft
Left Side Slope	1.50	H : V
Right Side Slope	1.50	H : V
Bottom Width	50.00	ft
Discharge	1,331.30	cfs



V. PROPOSED DRAINAGE FACILITIES

For most of the Mesa, drainage facilities are constructed as part of development or road projects, and include only facilities in the immediate vicinity of the projects. For the proposed future private development, no designs are available to show these future facilities. Caltrans has prepared plans for their SR-905 project, and those facilities are shown on the attached map.

The only Master Planned facility which needs to be constructed before development takes place is the Main Channel and Detention basin in the East Watershed. Details of this system are presented in Section VI.



PROPOSED DRAINAGE IMPROVEMENTS
OTAY MESA COMMUNITY PLAN UPDATE EIR

Scale: 1"=1000'
June 2006

KIMLEY-HORN AND ASSOCIATES

VI. PROPOSED DRAINAGE ALTERNATIVES

The historical drainage on the Mesa, with its flat terrain and shallow swales for drainage paths, did not become a problem until development started taking place in the 1960s. This development started concentrating flows in culverts under roads and redefined some of the historical drainage paths. Some of the development solved problems in some areas, but impacted other areas by moving the problem downstream. One of these areas is the existing creek that parallels La Media Road and eventually crosses the border into Mexico. The frequent flooding along portions of this channel is a constraint to future development for some of the areas along the creek.

1. NO PROJECT

The alternative of doing nothing to improve the drainage along the main creek channel would prevent future development from taking place along portions of La Media Road. The existing creek is not deep enough to allow the adjacent properties to drain effectively. To provide continued access along the truck route during storms, if the channel is not constructed, the roads will need to be raised or alternative routes identified. The existing intersection of Airway Road and La Media Road floods after any significant precipitation. The adjacent roads are too low to allow significant flows to pass under them, so they flood frequently. If the roads are raised to allow more flow to pass under them, they will impact the already-developed adjacent property, parts of which would now be lower than the roads, creating even more difficult drainage issues for the properties.

2. CONCRETE CHANNEL

The 1999 Otay Mesa Drainage Study recommended a concrete channel from Otay Mesa Road to the Border Detention Basin. The recommended plan was a concrete channel along the east side of La Media Road until reaching Siempre Viva Road, where it crossed under La Media and followed on the north side of Siempre Viva to box culverts under Siempre Viva that connected to the Border Detention Basin. All of the concrete channel alternatives assumed that the existing creek with its habitat would continue to carry low flows. The 1999 cost for this alternative was $10.6 million, which would be approximately $14.9 million in 2005 dollars without land acquisition.

3. LA MEDIA CHANNEL AND BORDER DETENTION BASIN

The largest watershed on the Mesa is the East Watershed, which covers an area at 6.78 square miles (4,340 Acres). All of the flow from this watershed collects at a concentration point at a large culvert where it crosses the border with Mexico and flows under the airport access road and airport runway before flowing into the Tijuana River.

This portion at the Mesa is extremely flat, and the adjacent properties can not effectively drain into the existing small creek channel without raising the elevations of the roads and developments near the creek. To allow for future development and to accommodate runoff from proposed future projects, a new channel is required with inverts from 3 to 5 feet below the existing creek channel.

The proposed channel has a bottom width that varies from 240 feet at the new border detention basin to 200 feet from north of Siempre Viva Road to the Airway Road/La Media Road intersection. The side slopes will vary between 4:1 to 10:1. Heavy riparian vegetation will be allowed to grow in the channel and no annual maintenance will be required. Once the vegetation has matured, maintenance of dead or fallen trees may be required every few years. There will be a 12 foot wide access road on each bank. The Channel will contain the 100 year flood flow with mature vegetation growth.

From the Airway Road/La Media Road intersection, a 35 foot wide concrete channel along the east side of La Media Road will connect with the proposed Caltrans culverts which will be constructed with SR 905. The RCB culverts under the intersection will need to accommodate existing utilities in both roads, which may impact the intersection and the utilities.

The Border Detention Basin will be designed to attenuate the peak post-development flows down to their pre-development levels for flows from 5 year through 100 year storms. The outlet structure will be less than six feet high, and will not be under the jurisdiction of the State of California DSOD. The design of the outlet structure will be prepared with final plans for the project. The Detention Basin will be approximately 1700' by 1500' and cover an area of approximately 58 acres.

Border Detention Basin

Area:	58 Acres
Max. Water Depth:	6.0 Feet
Max. Storage Volume:	308 AF

The basin will be graded to appear natural. Natural vegetation will be allowed to grow in the basin and no annual maintenance will be required. A low-flow stream will be created through the basin. A Maintenance Assessment District may be created for maintaining the channel and detention basin.

The basin and channel will require the removal of approximately 915,000 CY of soil. It is assumed that this export will be used on adjacent properties to raise the building pad grades thereby limiting the haul distance. A preliminary cost estimate was prepared which reflects both the construction costs and the land acquisition costs. A Property Ownership Map which shows the ownership within the East Watershed is attached.

La Media Channel and Border Detention Basin

Preliminary Opinion of Probable Construction Cost

2/8/2005

Kimley-Horn and Associates

Construction Items

Item No.	Description	Quantity	Units	Unit Price	Cost
1	Excavation	822,500	CY	$2	$1,645,000
2	Airway Road culvert (6~5'wx5'h)	300	CY	$1,500	$450,000
3	La Media/Airway Road intersection culvert (6~10'wx6'h)	1,500	CY	$1,500	$2,250,000
4	Siempre Viva Road culvert (8~10'wx8'h)	1,490	CY	$1,500	$2,235,000
5	Detention Basin Outlet Structure	1	LS	$100,000	$100,000
6	Traffic Control	1	LS	$100,000	$100,000
7	Utility Relocation	1	LS	$150,000	$150,000
8	Street Repair	1	LS	$50,000	$50,000
9	Erosion Control	1	LS	$50,000	$50,000
10	Revegetation	1	LS	$600,000	$600,000
		Subtotal			$7,630,000
		Contingency	20%		$1,526,000
		Total			$9,156,000

Land Acquisition

1	Land Acquisition (outside MHPA)*	2,610,000	SF	$4	$10,440,000
2	Land Acquisition (inside MHPA)**	1,820,000	SF	$1	$1,820,000
		Subtotal			$12,260,000
		Contingency	20%		$2,452,000
		Total			$14,712,000

Total Cost (Construction and Land Acquisition) $23,868,000

Notes: * Includes area of detention basin and channel south of Siempre Viva

** Includes entire area within MHPA boundary

*** Estimate does not include engineering, environmental, geotechnical, surveying, etc.

K:\095407000\Excel\[cost estimate.xls]Sheet1

OTAY MESA CPU

Earthwork Quantities

Cut: 822,500 CY

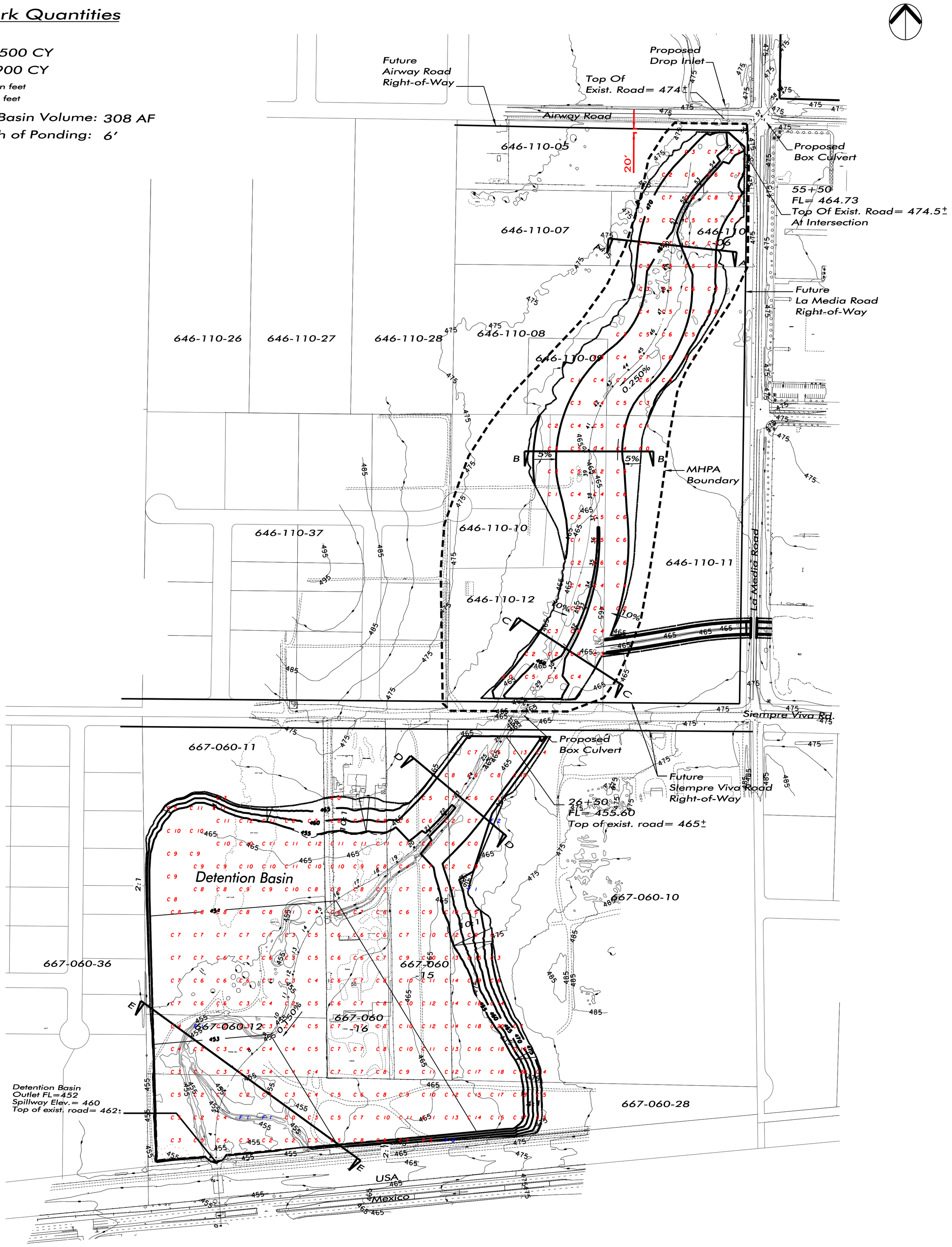
Fill: 900 CY

C = Cut depth in feet

F = Fill depth in feet

Detention Basin Volume: 308 AF

Max. Depth of Ponding: 6'



0 100 200 400

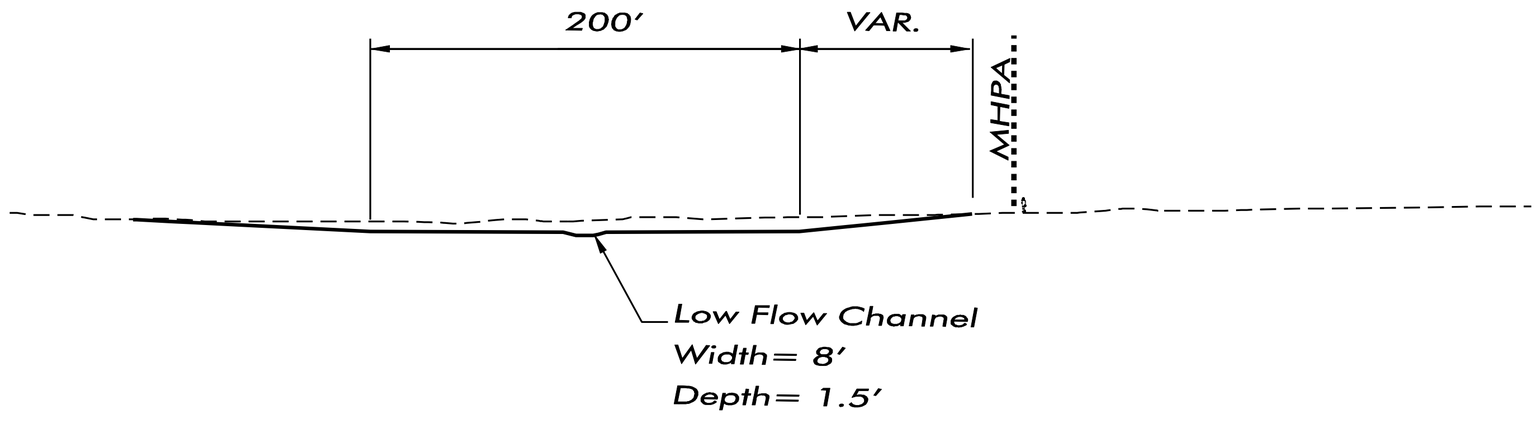
SCALE: 1" = 200'

KIMLEY-HORN and ASSOCIATES

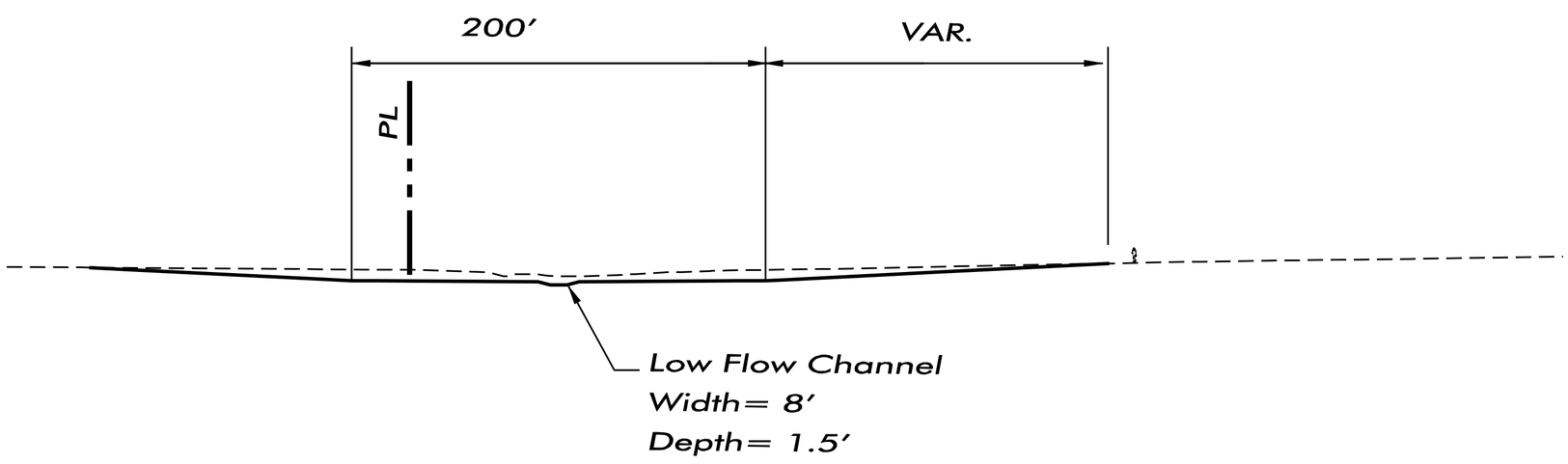
JUNE 2006

CONCEPTUAL CHANNEL/DETENTION BASIN GRADING

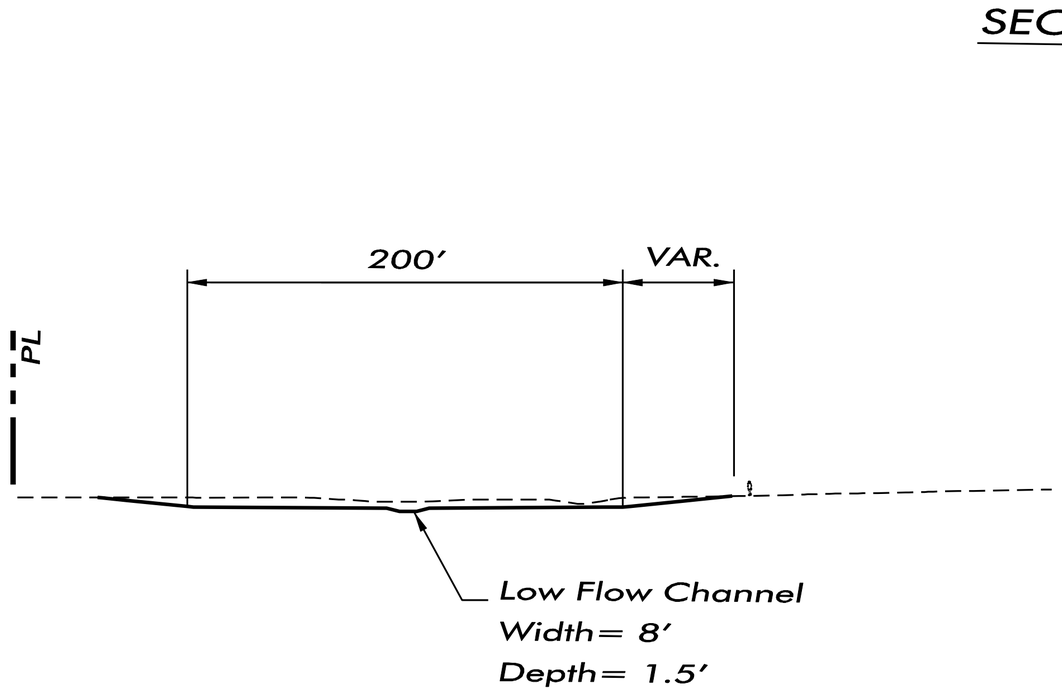
OTAY MESA CPU



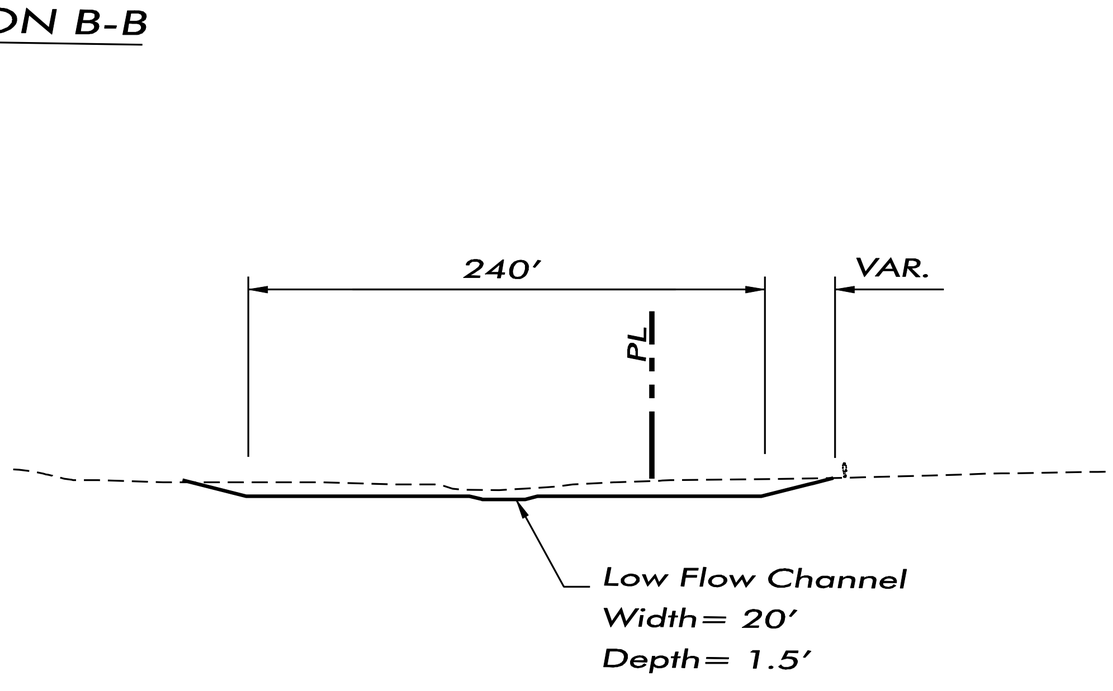
SECTION A-A



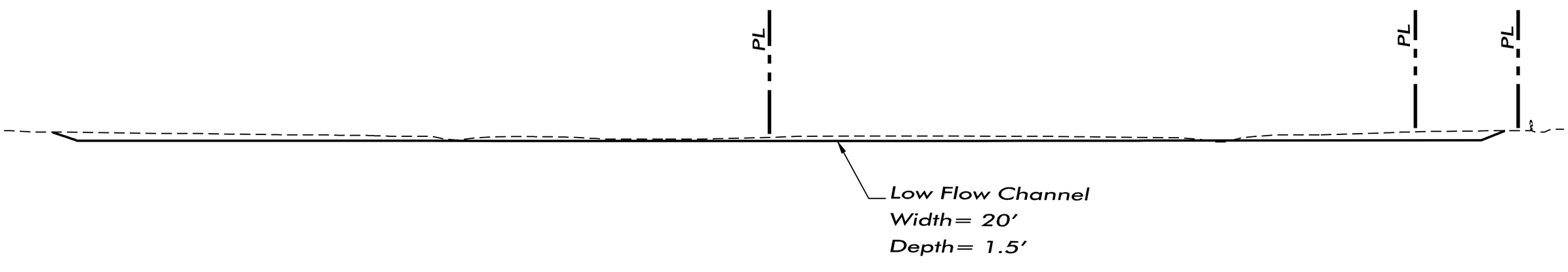
SECTION B-B



SECTION C-C



SECTION D-D



SECTION E-E

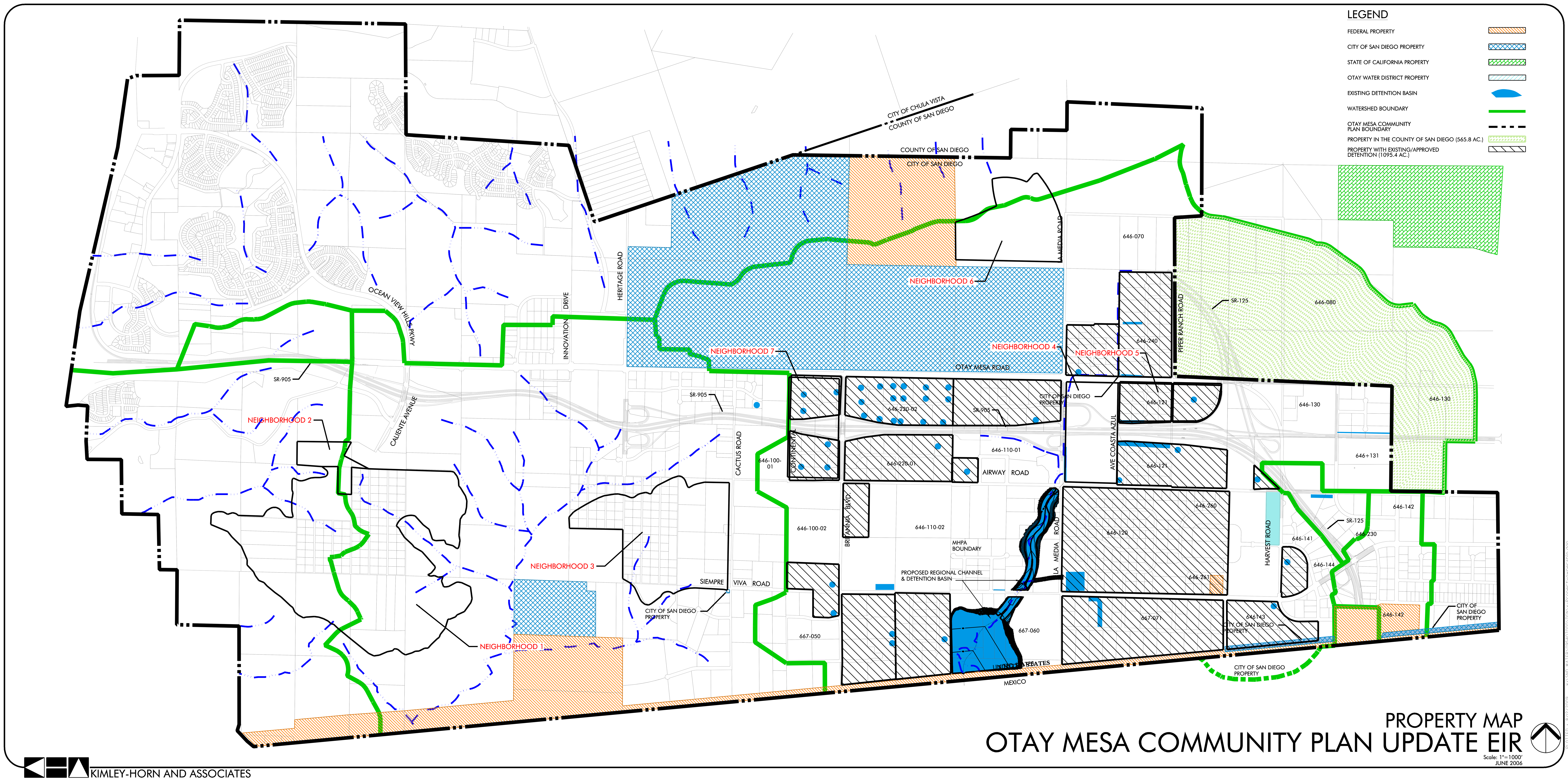
Note: No Vertical Exaggeration On Sections

0 25 50 100
SCALE: 1" = 50'

JUNE 2006

KIMLEY-HORN and ASSOCIATES

EARTHWORK CROSS SECTIONS


LEGEND
FEDERAL PROPERTY
CITY OF SAN DIEGO PROPERTY
STATE OF CALIFORNIA PROPERTY
OTAY WATER DISTRICT PROPERTY
EXISTING DETENTION BASIN
WATERSHED BOUNDARY
OTAY MESA COMMUNITY PLAN BOUNDARY
PROPERTY IN THE COUNTY OF SAN DIEGO (565.8 AC.)
PROPERTY WITH EXISTING/APPROVED DETENTION (1095.4 AC.)
CITY OF CHULA VISTA
COUNTY OF SAN DIEGO
CITY OF SAN DIEGO
NEIGHBORHOOD 1
NEIGHBORHOOD 2
NEIGHBORHOOD 3
NEIGHBORHOOD 4
NEIGHBORHOOD 5
NEIGHBORHOOD 6
NEIGHBORHOOD 7
OCEAN VIEW HILLS PKWY
CALIENTE AVENUE
INNOVATION DRIVE
HERITAGE ROAD
CACTUS ROAD
SR-905
SR-125
OTAY MESA ROAD
AIRWAY ROAD
SIEMPRE VIVA ROAD
BRITANNIA BLVD
LA MEDIA ROAD
AVE COSTA AZUL
PIPER RANCH ROAD
HARVEST ROAD
MHPA BOUNDARY
PROPOSED REGIONAL CHANNEL & DETENTION BASIN
CITY OF SAN DIEGO PROPERTY
UNITED STATES
MEXICO
646-070
646-080
646-130
646-131
646-121
646-240
646-220-02
646-220-01
646-110-01
646-110-02
646-100-02
646-120
646-260
646-261
646-141
646-142
646-144
646-230
646-143
667-050
667-060
667-071
PROPERTY MAP
OTAY MESA COMMUNITY PLAN UPDATE EIR
Scale: 1"=1000'
JUNE 2006
KIMLEY-HORN AND ASSOCIATES

VII. RECOMMENDED DRAINAGE DESIGN CRITERIA

Since the five watershed areas on the Mesa flow in every direction except east, they flow into different watersheds with different constraints and impacts. The runoff from the five watersheds will have different criteria for design of drainage facilities.

West Perimeter Watershed
This watershed consists of smaller Mesa-top watersheds with a total area of approximately 254 acres that drain to the west to three separate creeks in canyons and gullies. These creeks are carried under the SD&AE and Trolley tracks and through San Ysidro in buried storm drain systems. The storm drains under the tracks have hydraulic capacities of 30 cfs (18" RCP) and 125 cfs (36" RCP) based on the San Ysidro Boulevard Area Master Drainage plan prepared by BSI Consultants, February 15, 1996. Sub-basins OT3-7 and OT3-8 combine downstream into a single creek that flows to the 36" RCP. The current study estimates 140 cfs (Q100) will flow off of the Mesa into this sub-basin. This study does not address the capacity of the downstream system or include the hydrologic analysis for areas to the west of the Mesa, but clearly the 125 cfs capacity of the existing system will be exceeded. This area will need to be addressed in more detail during design of the upstream tributary development. Detention Basins are recommended which will reduce peak flows in the sub-basin to minimize impacts on the downstream system. These detention basins will reduce the peak, 50-year, and 100-year flow to predevelopment levels. Because of the unstable soils in this area, care should be taken that the proposed detention basins and relocated drainage facilities do not contribute to an increase in the risk of slides through increased saturation of the soil.

West Watershed
The West Watershed consists of smaller Mesa-top watersheds that drain into the tributary canyons of Spring Canyon. All of the flow from the watershed flows into Mexico at the Spring Canyon concentration point. Detention basins will be required to reduce the post-development peak flows to predevelopment levels for the 50-year and 100-year storm. If the detention basins concentrate flows at the upper edge of canyons, care must be taken to ensure that erosion potential is not increased downstream.

East Watershed
The East Watershed flows to Mexico at a single concentration point between Britannia and La Media roads. Requirements for the control of peak runoff from development in this watershed already exist. The "Notice" dated August 7, 1987 (page 2), sets criteria for detention basins and for storm drain sizing. As part of the future storm drain project in this watershed, a single detention basin will be constructed at the border. The construction of this basin will eliminate the need for individual on-site detention basins for subsequent development.

North Perimeter Watershed
These small watersheds along the northern edge of the Mesa flow into small canyons that flow into the Otay River. There are no peak flow attenuation requirements for flows from these watersheds. There may be water quality issues with the Otay River, and there may be erosion issues from storm drains on the Mesa. Only approximately 14 acres of Neighborhood 6 are in this watershed.

VIII. STORM WATER QUALITY REQUIREMENTS

Because of problems related to the poor water quality of storm water runoff from urban conveyance systems, the City requires that storm water Best Management Practices (BMPs) be constructed for all new projects. The storm water discharge contains pollution such as chemicals, trash, sediment, bacteria, metals, oil and grease. Construction projects which add impervious areas and change drainage patterns increase the discharge of these pollutants.

The Municipal Storm Water National Pollutant Discharge Elimination System Permit (NPDES Municipal Permit), approved February 21, 2001 by the San Diego Regional Water Quality Control Board (RWQCB), requires the City to implement regulations for constructing storm water BMPs for development projects.

In 2003, as part of the San Diego Municipal Code, the City published "Storm Water Standards – A Manual for Construction & Permanent Storm Water Best Management Practices Requirements." This manual is the reference document for all of the storm water issues encountered in development, including BMPs. Included in this report are Appendix C – Example Permanent Storm Water Best Management Practices, and the Storm Water Requirements Applicability Checklist from the City's Manual. Before preparing a drainage study, the "Storm Water Requirements Applicability Checklist" is completed. This checklist is used to determine the priority level of the project. Most of the projects on the Mesa will require Priority Project Permanent Storm Water BMPs and High Priority Construction Storm Water BMPs.

All projects subject to the priority permanent BMP requirements must include a "Water Quality Technical Report." From the manual, the report will include:

1. A drainage study report prepared by a civil engineer, hydrologist, or hydrogeologist registered in the State of California, with experience in the science of stream and river generated surface features (i.e., fluvial geomorphology) and water resources management, satisfactory to the City Engineer. The report shall consider the project area's location (from the larger watershed perspective), topography, soil and vegetation conditions, percent impervious area, natural and infrastructure drainage features, and any other relevant hydrologic and environmental factors to be protected specific to the project area's watershed.
2. A field reconnaissance to observe and report on downstream conditions, including undercutting erosion, slope stability, vegetative stress (due to flooding, erosion, water quality degradation, or loss of water supplies) and the area's susceptibility to erosion or habitat alteration as a result of any future upstream development.
3. A hydrologic analysis to include rainfall runoff characteristics from the project area including at a minimum, peak runoff, time of concentration, and detention volume (if appropriate). These characteristics shall be developed for the two-year and ten-year frequency, six-hour or 24-hour, type B storm for the coastal areas of San Diego County. The largest peak flow should be included in the report. The report shall also report the project's conditions of concern based on the hydrologic and downstream conditions discussed above. Where downstream conditions of concern have been identified, the drainage study shall establish that pre-project hydrologic conditions that minimize impacts on those downstream conditions of concern would be either improved or maintained by the proposed project, satisfactory to the City Engineer, by incorporating the permanent BMP requirements.

Appendix D of the Manual includes detailed guidelines for the Water Quality Technical Report.

There are numerous alternative permanent BMPs that can be used for each project. The alternatives include Site Design BMPs, Source Control BMPs, and Treatment Control BMPs. The Site Design BMPs are primary ways to reduce storm water runoff through means such as increased pervious areas, increased infiltration, use of natural channels, and appropriate landscaping. All of these except dry wells are applicable to the Mesa. Source Control BMPs are meant to control pollutants at their source before they enter storm water, and are all applicable to the Mesa. Treatment Control BMPs treat the storm water before it leaves the property, and include natural methods such as biofilters, detention basins, wetlands, and porous pavement, and mechanical methods such as filters and separators. The one Treatment Control BMP that is not applicable to the Mesa is infiltration, which is not very effective on the Mesa because of the clay soils.

Most of Otay Mesa drains to the south across the border with Mexico and eventually into the Tijuana River. A small portion flows north into the Otay River, and the far western part of the Mesa flows to the west through San Ysidro and then into the Tijuana River. The Tijuana River has been identified by the 2002 Clean Water Act as a "Section 303(d) Water Quality Limited" river. The pollutants of concern which are included in the attached pages from the USEPA, need to be listed, and the new development project's potential impacts on these pollutants need to be included in the project's drainage report.

Recommended Storm Water Policies

1. **Apply water quality protection measures to land development projects during project design, permitting, construction, and operations in order to minimize the quantity of runoff generated on-site, the disruption of natural water flows and the contamination of storm water runoff.**

    a. Increase on-site infiltration, and preserve, restore or incorporate natural drainage systems into site design
    b. Reduce the amount of impervious surfaces through selection of materials, site planning, and narrowing street widths where possible.
    c. Increase the use of natural vegetation and landscaping in drainage design.
    d. Avoid conversion of areas particularly susceptible to erosion and sediment loss (e.g.: steep slopes), and where unavoidable, enforce regulations that minimize these impacts.
    e. Avoid land use, site development, and zoning regulations that limit impacts on, and protect the natural integrity of topography, drainage systems, and water bodies.
    f. Maintain landscape design standards that minimize the use of pesticides and herbicides.
    g. Enforce maintenance requirements in development permit conditions.

2. **Require construction contractors to comply with accepted storm water pollution prevention planning practices for all projects.**

    a. Minimize the amount of graded land surface exposed to erosion and enforce control ordinances
    b. Continue routine inspection practices to check for proper erosion control methods and housekeeping practices during construction.
    c. Ensure that contractors are aware of and implement urban runoff control programs.

3. **Encourage measures to promote the proper collection and disposal of pollutants at the source, rather than allowing them to enter the storm drain system.**

    a. Promote the provision of used oil recycling and/or hazardous waste recycling facilities and drop-off locations.
    b. Follow up on complaints of illegal discharges and accidental spills to storm drains, waterways, and canyons.

APPENDIX C

EXAMPLE PERMANENT STORM WATER BEST MANAGEMENT PRACTICES

The following are a list of BMPs may be used to minimize the introduction of pollutants of concern that may result in significant impacts to receiving waters. Other BMPs approved by the Development Services Department as being equal or more effective in pollutant reduction than comparable BMPs identified below are acceptable. All BMPs must comply with local zoning and building codes and other applicable regulations.

Site Design BMPs

Minimizing Impervious Areas

- Reduce sidewalk widths
- Incorporate landscaped buffer areas between sidewalks and streets.
- Design residential streets for the minimum required pavement widths
- Minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover.
- Use open space development that incorporates smaller lot sizes
- Increase building density while decreasing the building footprint
- Reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together
- Reduce overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas

Increase Rainfall Infiltration

- Use permeable materials for private sidewalks, driveways, parking lots, and interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.)
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the urban runoff conveyance system

Maximize Rainfall Interception

- Maximizing canopy interception and water conservation by preserving existing native trees and shrubs, and planting Additional native or drought tolerant trees and large shrubs.

Minimize Directly Connected Impervious Areas (DCIAs)

- Draining rooftops into adjacent landscaping prior to discharging to the storm water conveyance system

- Draining parking lots into landscape areas co-designed as biofiltration areas
- Draining roads, sidewalks, and impervious trails into adjacent landscaping

Slope and Channel Protection

Use of natural drainage systems to the maximum extent practicable

- Stabilized permanent channel crossings
- Planting native or drought tolerant vegetation on slopes
- Energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined Channels

Maximize Rainfall Interception

- Cisterns
- Foundation planting

Increase Rainfall Infiltration

- Dry wells

Source Control BMPs

- Storm water conveyance system stenciling and signage
- Outdoor material and trash storage area designed to reduce or control rainfall runoff
- Efficient irrigation system

Treatment Control BMPs

Biofilters

- Grass swale
- Grass strip
- Wetland vegetation swale
- Bioretention

Detention Basins

- Extended/dry detention basin with grass lining
- Extended/dry detention basin with impervious lining

Infiltration

- Infiltration basin
- Infiltration trench

Pervious Paving
- Porous asphalt
- Porous concrete
- Porous modular concrete block

Wet Ponds and Wetlands
- Wet pond (permanent pool)
- Constructed wetland

Drainage Inserts
- Catch basin/storm drain inserts
- Catch basin screens

Filtration Systems
- Media filtration
- Sand filtration

Hydrodynamic Separation Systems
- Swirl concentrator
- Cyclone separator
- Baffle boxes

City of San Diego
Development Services
1222 First Ave., MS-302
San Diego, CA 92101
(619) 446-5000 for information

THE CITY OF SAN DIEGO

Storm Water Requirements Applicability Checklist

Project Address:	Assessor Parcel Number(s):	Project Number *(for City Use Only)*

Complete Sections 1 and 2 of the following checklist to determine your project's permanent and construction storm water best management practices requirements. This form must be completed and submitted with your permit application.

Section 1 - Permanent Storm Water BMP Requirements:

If any answers to Part A are answered "Yes," your project is subject to the "Priority Project Permanent Storm Water BMP Requirements," and "Standard Permanent Storm Water BMP Requirements" of the Storm Water Standards Manual, Section III, "Permanent Storm Water BMP Selection Procedure." If all answers to Part A are "No," and any answers to Part B are "Yes," your project is only subject to the Standard Permanent Storm Water BMP Requirements. If every question in Part A and B is answered "No," your project is exempt from permanent storm water requirements.

Part A: Determine Priority Project Permanent Storm Water BMP Requirements.

Does the project meet the definition of one or more of the priority project categories?*

1.	Detached residential development of 10 or more units	Yes	No
2.	Attached residential development of 10 or more units	Yes	No
3.	Commercial development greater than 100,000 square feet	Yes	No
4.	Automotive repair shop	Yes	No
5.	Restaurant	Yes	No
6.	Steep hillside development greater than 5,000 square feet	Yes	No
7.	Project discharging to receiving waters within Water Quality Sensitive Areas	Yes	No
8.	Parking lots greater than or equal to 5,000 square feet or with at least 15 parking spaces, and potentially exposed to urban runoff	Yes	No
9.	Streets, roads, highways, and freeways which would create a new paved surface that is 5,000 square feet or greater	Yes	No
10.	Significant redevelopment over 5,000 square feet	Yes	No

** Refer to the definitions section in the* Storm Water Standards *for expanded definitions of the priority project categories.*

Limited Exclusion: *Trenching and resurfacing work associated with utility projects are not considered priority projects. Parking lots, buildings and other structures associated with utility projects are priority projects if one or more of the criteria in Part A is met. If all answers to Part A are "No", continue to Part B.*

Part B: Determine Standard Permanent Storm Water Requirements.

Does the project propose:

1.	New impervious areas, such as rooftops, roads, parking lots, driveways, paths and sidewalks?	Yes	No
2.	New pervious landscape areas and irrigation systems?	Yes	No
3.	Permanent structures within 100 feet of any natural water body?	Yes	No
4.	Trash storage areas?	Yes	No
5.	Liquid or solid material loading and unloading areas?	Yes	No
6.	Vehicle or equipment fueling, washing, or maintenance areas?	Yes	No
7.	Require a General NPDES Permit for Storm Water Discharges Associated with Industrial Activities (Except construction)?*	Yes	No
8.	Commercial or industrial waste handling or storage, excluding typical office or household waste?	Yes	No
9.	Any grading or ground disturbance during construction?	Yes	No
10.	Any new storm drains, or alteration to existing storm drains?	Yes	No

*To find out if your project is required to obtain an individual General NPDES Permit for Storm Water Discharges Associated with Industrial Activities, visit the State Water Resources Control Board web site at, www.swrcb.ca.gov/stormwtr/industrial.html

OVER

Section 2. Construction Storm Water BMP Requirements:

If the answer to question 1 of Part C is answered "Yes," your project is subject to Section IV of the Storm Water Standards Manual, "Construction Storm Water BMP Performance Standards," and must prepare a Storm Water Pollution Prevention Plan (SWPPP). If the answer to question 1of Part C is "No," but the answer to any of the remaining questions is "Yes," your project is subject to Section IV of the Storm Water Standards Manual, "Construction Storm Water BMP Performance Standards," and must prepare a Water Pollution Control Plan (WPCP). If every question in Part C is answered "No," your project is exempt from any construction storm water BMP requirements. If any of the answers to the questions in Part C are "Yes," complete the construction site prioritization in Part D below.

Part C: Determine Construction Phase Storm Water Requirements.

Would the project meet any of these criteria during construction?

1. Is the project subject to California's statewide General NPDES Permit for Storm Water Discharges Associated With Construction Activities? ..... Yes No
2. Does the project propose grading or soil disturbance? ..... Yes No
3. Would storm water or urban runoff have the potential to contact any portion of the construction area, including washing and staging areas? ..... Yes No
4. Would the project use any construction materials that could negatively affect water quality if discharged from the site (such as, paints, solvents, concrete, and stucco)? ..... Yes No

Part D: Determine Construction Site Priority

In accordance with the Municipal Permit, each construction site with construction storm water BMP requirements must be designated with a priority: high, medium or low. This prioritization must be completed with this form, noted on the plans, and included in the SWPPP or WPCP. Indicate the project's priority in one of the check boxes using the criteria below, and existing and surrounding conditions of the project, the type of activities necessary to complete the construction and any other extenuating circumstances that may pose a threat to water quality. The City reserves the right to adjust the priority of the projects both before and during construction. [Note: The construction priority does NOT change construction BMP requirements that apply to projects; all construction BMP requirements must be identified on a case-by-case basis. The construction priority does affect the frequency of inspections that will be conducted by City staff. See Section IV.1 for more details on construction BMP requirements.]

☐ 1) High Priority

a) Projects where the site is 50 acres or more and grading will occur during the wet season

b) Projects 5 acres or more and tributary to an impaired water body for sediment (e.g., Peñasquitos watershed)

c) Projects 5 acres or more within or directly adjacent to or discharging directly to a coastal lagoon or other receiving water within an environmentally sensitive area

d) Projects, active or inactive, adjacent or tributary to sensitive water bodies

☐ 2) Medium Priority

a) Capital Improvement Projects where grading occurs, however a Storm Water Pollution Prevention Plan (SWPPP) is not required under the State General Construction Permit (i.e., water and sewer replacement projects, intersection and street re-alignments, widening, comfort stations, etc.)

b) Permit projects in the public right-of-way where grading occurs, however SWPPPs are not required, such as installation of sidewalk, substantial retaining walls, curb and gutter for an entire street frontage, etc.

c) Permit projects on private property where grading permits are required (i.e., cuts over 5 feet, fills over 3 feet), however, Notice Of Intents (NOIs) and SWPPPs are not required.

☐ 3) Low Priority

a) Capital Projects where minimal to no grading occurs, such as signal light and loop installations, street light installations, etc.

b) Permit projects in the public right-of-way where minimal to no grading occurs, such as pedestrian ramps, driveway additions, small retaining walls, etc.

c) Permit projects on private property where grading permits are not required, such as small retaining walls, single-family homes, small tenant improvements, etc.

Name of Owner or Agent *(Please Print)*:	Title:
Signature:	Date:

APPENDICES

Appendix A

- AES Hydrology Calculations

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2003 Advanced Engineering Software (aes)
              Ver. 1.5A Release Date: 01/01/2003  License ID 1499

                              Analysis prepared by:

                          Kimley-Horn and Associates San Diego
                                517 4th Avenue Suite 301
                               San Diego, California 92101
                             (619) 234-9411 Fax (619) 234-9433

 ************************** DESCRIPTION OF STUDY **************************
* Otay Mesa Watershed Analysis                                            *
* 50 Year Storm Event P=1.70                                              *
* 5/12/05 AMC                                                             *
 **************************************************************************

  FILE NAME: C:\Drainage\407000\OT3-1.DAT
  TIME/DATE OF STUDY: 08:03 05/12/2005
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  1985 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  50.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   1.700
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *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.*

**************************************************************************
  FLOW PROCESS FROM NODE   3100.00 TO NODE   3101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
```

```
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.86(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    106.00
 DOWNSTREAM ELEVATION(FEET) =    104.32
 ELEVATION DIFFERENCE(FEET) =      1.68
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.86
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.715
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   3101.00 TO NODE   3102.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   180.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0240
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =   5.41   Tc(MIN.) =  16.27
 LONGEST FLOWPATH FROM NODE   3100.00 TO NODE   3102.00 =   250.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3102.00 TO NODE   3103.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.092
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   19.30   SUBAREA RUNOFF(CFS) =   18.17
 TOTAL AREA(ACRES) =     19.40   TOTAL RUNOFF(CFS) =   18.29
 TC(MIN.) =  16.27

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   3110.00 TO NODE   3111.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    110.00
```

```
 DOWNSTREAM ELEVATION(FEET) =    108.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   3111.00 TO NODE   3112.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =   9.91   Tc(MIN.) =  20.76
 LONGEST FLOWPATH FROM NODE   3110.00 TO NODE   3112.00 =   400.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3112.00 TO NODE   3113.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.788
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   14.70   SUBAREA RUNOFF(CFS) =   11.83
 TOTAL AREA(ACRES) =     14.80   TOTAL RUNOFF(CFS) =   11.95
 TC(MIN.) =  20.76

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   3200.00 TO NODE   3201.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.86(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    122.00
 DOWNSTREAM ELEVATION(FEET) =    120.29
 ELEVATION DIFFERENCE(FEET) =      1.71
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.86
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.716
```

```
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   3201.00 TO NODE   3202.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0240
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  24.94   Tc(MIN.) =  35.80
 LONGEST FLOWPATH FROM NODE   3200.00 TO NODE   3202.00 =   900.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3202.00 TO NODE   3203.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.258
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   47.00   SUBAREA RUNOFF(CFS) =   26.61
 TOTAL AREA(ACRES) =     47.10   TOTAL RUNOFF(CFS) =   26.74
 TC(MIN.) =  35.80

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   3300.00 TO NODE   3301.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.83(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    108.00
 DOWNSTREAM ELEVATION(FEET) =    106.13
 ELEVATION DIFFERENCE(FEET) =      1.87
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.83
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.721
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

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

```
 FLOW PROCESS FROM NODE   3201.00 TO NODE   3202.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0267
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.56   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =   6.90   Tc(MIN.) =  17.73
 LONGEST FLOWPATH FROM NODE   3300.00 TO NODE   3202.00 =   300.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3302.00 TO NODE   3303.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.980
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   11.70   SUBAREA RUNOFF(CFS) =   10.42
 TOTAL AREA(ACRES) =     11.80   TOTAL RUNOFF(CFS) =   10.55
 TC(MIN.) =  17.73

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   3400.00 TO NODE   3401.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.84(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    118.00
 DOWNSTREAM ELEVATION(FEET) =    116.20
 ELEVATION DIFFERENCE(FEET) =      1.80
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.84
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.719
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   3401.00 TO NODE   3402.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
```

```
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   630.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0257
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.56   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  18.91   Tc(MIN.) =  29.75
  LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3402.00 =   700.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3402.00 TO NODE   3403.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.418
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   34.90   SUBAREA RUNOFF(CFS) =   22.27
  TOTAL AREA(ACRES) =     35.00   TOTAL RUNOFF(CFS) =   22.39
  TC(MIN.) =  29.75

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3500.00 TO NODE   3501.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    110.00
  DOWNSTREAM ELEVATION(FEET) =    108.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   3501.00 TO NODE   3502.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
```

```
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =   9.91   Tc(MIN.) =  20.76
 LONGEST FLOWPATH FROM NODE   3500.00 TO NODE   3502.00 =   400.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3502.00 TO NODE   3503.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.788
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   16.40   SUBAREA RUNOFF(CFS) =   13.20
 TOTAL AREA(ACRES) =     16.50   TOTAL RUNOFF(CFS) =   13.32
 TC(MIN.) =  20.76

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   3600.00 TO NODE   3601.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.83(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    108.00
 DOWNSTREAM ELEVATION(FEET) =    106.13
 ELEVATION DIFFERENCE(FEET) =      1.87
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.83
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.721
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   3601.00 TO NODE   3602.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0267
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.56   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =   6.90   Tc(MIN.) =  17.73
```

```
 LONGEST FLOWPATH FROM NODE   3600.00 TO NODE   3602.00 =   300.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3602.00 TO NODE   3603.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.980
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   12.10   SUBAREA RUNOFF(CFS) =   10.78
 TOTAL AREA(ACRES) =     12.20   TOTAL RUNOFF(CFS) =   10.90
 TC(MIN.) =  17.73

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   3700.00 TO NODE   3701.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    120.00
 DOWNSTREAM ELEVATION(FEET) =    118.25
 ELEVATION DIFFERENCE(FEET) =     1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   3701.00 TO NODE   3702.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   730.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  21.92   Tc(MIN.) =  32.77
 LONGEST FLOWPATH FROM NODE   3700.00 TO NODE   3702.00 =   800.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3702.00 TO NODE   3703.00 IS CODE =  81
```

```
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.332
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =    46.00   SUBAREA RUNOFF(CFS) =   27.57
  TOTAL AREA(ACRES) =      46.10   TOTAL RUNOFF(CFS) =   27.69
  TC(MIN.) =  32.77

****************************************************************************
  FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    3800.00 TO NODE    3801.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =     70.00
  UPSTREAM ELEVATION(FEET) =     125.00
  DOWNSTREAM ELEVATION(FEET) =     123.25
  ELEVATION DIFFERENCE(FEET) =       1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =       0.12
  TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.12

****************************************************************************
  FLOW PROCESS FROM NODE    3801.00 TO NODE    3802.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.12
  FLOW VELOCITY(FEET/SEC.) =    0.55   FLOW DEPTH(FEET) =    0.02
  TRAVEL TIME(MIN.) =  27.93   Tc(MIN.) =  38.78
  LONGEST FLOWPATH FROM NODE    3800.00 TO NODE    3802.00 =  1000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    3802.00 TO NODE    3803.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.195
```

```
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   51.30   SUBAREA RUNOFF(CFS) =   27.59
  TOTAL AREA(ACRES) =     51.40   TOTAL RUNOFF(CFS) =   27.71
  TC(MIN.) =  38.78

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2100.00 TO NODE   2101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    128.00
  DOWNSTREAM ELEVATION(FEET) =    126.22
  ELEVATION DIFFERENCE(FEET) =      1.78
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.718
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1030.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0255
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.56   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  30.92   Tc(MIN.) =  41.77
  LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2102.00 =  1100.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2102.00 TO NODE   2103.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.139
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   33.20   SUBAREA RUNOFF(CFS) =   17.02
```

```
 TOTAL AREA(ACRES) =     33.30   TOTAL RUNOFF(CFS) =   17.14
 TC(MIN.) =  41.77

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2200.00 TO NODE   2201.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    163.00
 DOWNSTREAM ELEVATION(FEET) =    161.24
 ELEVATION DIFFERENCE(FEET) =      1.76
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.718
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   2201.00 TO NODE   2202.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2430.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0252
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.56   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  72.97   Tc(MIN.) =  83.82
 LONGEST FLOWPATH FROM NODE   2200.00 TO NODE   2202.00 =  2500.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2202.00 TO NODE   2203.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.727
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =  126.10   SUBAREA RUNOFF(CFS) =   41.25
 TOTAL AREA(ACRES) =    126.20   TOTAL RUNOFF(CFS) =   41.37
 TC(MIN.) =  83.82

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

```
 FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    2180.00 TO NODE    2181.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED = 10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    130.00
 DOWNSTREAM ELEVATION(FEET) =    128.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =    0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE    2181.00 TO NODE    2182.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =  10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  33.94   Tc(MIN.) =  44.79
 LONGEST FLOWPATH FROM NODE    2180.00 TO NODE    2182.00 =  1200.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2182.00 TO NODE    2183.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.089
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   97.00   SUBAREA RUNOFF(CFS) =   47.54
 TOTAL AREA(ACRES) =    97.10   TOTAL RUNOFF(CFS) =   47.66
 TC(MIN.) =  44.79

****************************************************************************
 FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.86(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    122.00
 DOWNSTREAM ELEVATION(FEET) =    120.29
 ELEVATION DIFFERENCE(FEET) =      1.71
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.86
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.716
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   2401.00 TO NODE   2402.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0244
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  24.94   Tc(MIN.) =  35.80
 LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2402.00 =   900.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2402.00 TO NODE   2403.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.258
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   67.70   SUBAREA RUNOFF(CFS) =   38.34
 TOTAL AREA(ACRES) =     67.80   TOTAL RUNOFF(CFS) =   38.46
 TC(MIN.) =  35.80

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2500.00 TO NODE   2501.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
```

```
 UPSTREAM ELEVATION(FEET) =    130.00
 DOWNSTREAM ELEVATION(FEET) =    128.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   2501.00 TO NODE   2502.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  33.94   Tc(MIN.) =  44.79
 LONGEST FLOWPATH FROM NODE   2500.00 TO NODE   2502.00 =  1200.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2502.00 TO NODE   2503.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.089
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   40.70   SUBAREA RUNOFF(CFS) =   19.95
 TOTAL AREA(ACRES) =     40.80   TOTAL RUNOFF(CFS) =   20.07
 TC(MIN.) =  44.79

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2600.00 TO NODE   2601.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    130.00
 DOWNSTREAM ELEVATION(FEET) =    128.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
```

```
  50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   2601.00 TO NODE   2602.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  33.94   Tc(MIN.) =  44.79
 LONGEST FLOWPATH FROM NODE   2600.00 TO NODE   2602.00 =  1200.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2602.00 TO NODE   2603.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.089
 GRASS FAIR COVER RUNOFF COEFFICIENT =.4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   34.70   SUBAREA RUNOFF(CFS) =   17.00
 TOTAL AREA(ACRES) =     34.80   TOTAL RUNOFF(CFS) =   17.13
 TC(MIN.) =  44.79

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2700.00 TO NODE   2701.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    105.00
 DOWNSTREAM ELEVATION(FEET) =    103.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.213
  50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.536
 SUBAREA RUNOFF(CFS) =      0.16
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.16

****************************************************************************
 FLOW PROCESS FROM NODE   2701.00 TO NODE   2702.00 IS CODE =  51
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   130.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.16
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.03
  TRAVEL TIME(MIN.) =   3.96   Tc(MIN.) =  11.17
  LONGEST FLOWPATH FROM NODE   2700.00 TO NODE   2702.00 =   200.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2702.00 TO NODE   2703.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.667
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   14.80   SUBAREA RUNOFF(CFS) =   17.76
  TOTAL AREA(ACRES) =     14.90   TOTAL RUNOFF(CFS) =   17.92
  TC(MIN.) =  11.17

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2800.00 TO NODE   2801.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.18(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    128.00
  DOWNSTREAM ELEVATION(FEET) =     26.22
  ELEVATION DIFFERENCE(FEET) =    101.78
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.18
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.832
  SUBAREA RUNOFF(CFS) =      0.13
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.13

****************************************************************************
  FLOW PROCESS FROM NODE   2801.00 TO NODE   2802.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1030.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.13
 FLOW VELOCITY(FEET/SEC.) =   0.58   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  29.68   Tc(MIN.) =  39.86
 LONGEST FLOWPATH FROM NODE   2800.00 TO NODE   2802.00 =  1100.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2802.00 TO NODE   2803.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.174
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   81.20   SUBAREA RUNOFF(CFS) =   42.90
 TOTAL AREA(ACRES) =     81.30   TOTAL RUNOFF(CFS) =   43.03
 TC(MIN.) =  39.86

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2900.00 TO NODE   2901.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.84(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    118.00
 DOWNSTREAM ELEVATION(FEET) =    116.20
 ELEVATION DIFFERENCE(FEET) =      1.80
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.84
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.719
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   2901.00 TO NODE   2902.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   630.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
```

```
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.56   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  18.91   Tc(MIN.) =  29.75
 LONGEST FLOWPATH FROM NODE   2900.00 TO NODE   2902.00 =   700.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2902.00 TO NODE   2903.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.418
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   36.80   SUBAREA RUNOFF(CFS) =   23.48
 TOTAL AREA(ACRES) =     36.90   TOTAL RUNOFF(CFS) =   23.60
 TC(MIN.) =  29.75

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2910.00 TO NODE   2911.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    108.00
 DOWNSTREAM ELEVATION(FEET) =    106.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
  50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   2911.00 TO NODE   2912.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =   6.91   Tc(MIN.) =  17.76
 LONGEST FLOWPATH FROM NODE   2910.00 TO NODE   2912.00 =   300.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE   2912.00 TO NODE   2913.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.978
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =    12.80   SUBAREA RUNOFF(CFS) =   11.39
  TOTAL AREA(ACRES) =      12.90   TOTAL RUNOFF(CFS) =   11.51
  TC(MIN.) =  17.76

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2100.00 TO NODE   2101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    160.00
  DOWNSTREAM ELEVATION(FEET) =    158.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2101.00 TO NODE   2102.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2330.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  69.97   Tc(MIN.) =  80.82
  LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2102.00 =  2400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2102.00 TO NODE   2103.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.744
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =  128.30   SUBAREA RUNOFF(CFS) =   42.96
 TOTAL AREA(ACRES) =    128.40   TOTAL RUNOFF(CFS) =   43.09
 TC(MIN.) =  80.82

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2110.00 TO NODE   2111.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    143.00
 DOWNSTREAM ELEVATION(FEET) =    141.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   2111.00 TO NODE   2112.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1630.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  48.95   Tc(MIN.) =  59.80
 LONGEST FLOWPATH FROM NODE   2110.00 TO NODE   2112.00 =  1700.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2112.00 TO NODE   2113.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.904
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
```

```
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =  275.50   SUBAREA RUNOFF(CFS) =  112.04
  TOTAL AREA(ACRES) =    275.60   TOTAL RUNOFF(CFS) =  112.16
  TC(MIN.) =  59.80

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   2120.00 TO NODE   2121.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    113.00
  DOWNSTREAM ELEVATION(FEET) =    111.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
  FLOW PROCESS FROM NODE   2121.00 TO NODE   2122.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  12.91   Tc(MIN.) =  23.76
  LONGEST FLOWPATH FROM NODE   2120.00 TO NODE   2122.00 =   500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   2122.00 TO NODE   2123.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.639
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =   23.50   SUBAREA RUNOFF(CFS) =   17.33
  TOTAL AREA(ACRES) =     23.60   TOTAL RUNOFF(CFS) =   17.45
```

```
 TC(MIN.) =  23.76

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2130.00 TO NODE   2131.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    115.00
 DOWNSTREAM ELEVATION(FEET) =    113.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   2131.00 TO NODE   2132.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   530.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  15.92   Tc(MIN.) =  26.77
 LONGEST FLOWPATH FROM NODE   2130.00 TO NODE   2132.00 =   600.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2132.00 TO NODE   2133.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.518
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   61.40   SUBAREA RUNOFF(CFS) =   41.94
 TOTAL AREA(ACRES) =     61.50   TOTAL RUNOFF(CFS) =   42.06
 TC(MIN.) =  26.77

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
```

```
------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
========================================================================

************************************************************************
 FLOW PROCESS FROM NODE   2140.00 TO NODE   2141.00 IS CODE =  21
------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    125.00
 DOWNSTREAM ELEVATION(FEET) =    123.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

************************************************************************
 FLOW PROCESS FROM NODE   2141.00 TO NODE   2142.00 IS CODE =  51
------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  27.93   Tc(MIN.) =  38.78
 LONGEST FLOWPATH FROM NODE   2140.00 TO NODE   2142.00 =  1000.00 FEET.

************************************************************************
 FLOW PROCESS FROM NODE   2142.00 TO NODE   2143.00 IS CODE =  81
------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
========================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.195
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   48.30   SUBAREA RUNOFF(CFS) =   25.97
 TOTAL AREA(ACRES) =     48.40   TOTAL RUNOFF(CFS) =   26.10
 TC(MIN.) =  38.78

************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
========================================================================
```

```
****************************************************************************
 FLOW PROCESS FROM NODE   2150.00 TO NODE   2151.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    150.00
 DOWNSTREAM ELEVATION(FEET) =    148.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   2151.00 TO NODE   2152.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1930.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  57.96   Tc(MIN.) =  68.81
 LONGEST FLOWPATH FROM NODE   2150.00 TO NODE   2152.00 =  2000.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2152.00 TO NODE   2153.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.826
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =  153.70   SUBAREA RUNOFF(CFS) =   57.10
 TOTAL AREA(ACRES) =   153.80   TOTAL RUNOFF(CFS) =   57.22
 TC(MIN.) =  68.81

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2160.00 TO NODE   2161.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
  WITH 10-MIN. ADDED =  10.85(MIN.)
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    160.00
  DOWNSTREAM ELEVATION(FEET) =    158.25
  ELEVATION DIFFERENCE(FEET) =      1.75
  NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

******************************************************************************
  FLOW PROCESS FROM NODE   2161.00 TO NODE   2162.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2330.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0250
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
  FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
  TRAVEL TIME(MIN.) =  69.97   Tc(MIN.) =  80.82
  LONGEST FLOWPATH FROM NODE   2160.00 TO NODE   2162.00 =  2400.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE   2162.00 TO NODE   2163.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
    50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.744
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
  SUBAREA AREA(ACRES) =  121.60   SUBAREA RUNOFF(CFS) =   40.72
  TOTAL AREA(ACRES) =    121.70   TOTAL RUNOFF(CFS) =   40.84
  TC(MIN.) =  80.82

******************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
------------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE   2170.00 TO NODE   2171.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  84
```

```
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    175.00
 DOWNSTREAM ELEVATION(FEET) =    173.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   2171.00 TO NODE   2172.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2930.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) =  87.99   Tc(MIN.) =  98.84
 LONGEST FLOWPATH FROM NODE   2170.00 TO NODE   2172.00 =  3000.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2172.00 TO NODE   2173.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.654
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =   60.20   SUBAREA RUNOFF(CFS) =   17.70
 TOTAL AREA(ACRES) =     60.30   TOTAL RUNOFF(CFS) =   17.83
 TC(MIN.) =  98.84

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   9990.00 TO NODE   9991.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 NATURAL WATERSHED NOMOGRAPH TIME OF CONCENTRATION (APPENDIX X-A)
 WITH 10-MIN. ADDED =  10.85(MIN.)
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =   1300.00
```

```
 DOWNSTREAM ELEVATION(FEET) =   1298.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 NATURAL WATERSHED TIME OF CONCENTRATION =  10.85
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.717
 SUBAREA RUNOFF(CFS) =      0.12
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.12

****************************************************************************
 FLOW PROCESS FROM NODE   9991.00 TO NODE   9992.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  9930.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0300
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.12
 FLOW VELOCITY(FEET/SEC.) =   0.55   FLOW DEPTH(FEET) =   0.02
 TRAVEL TIME(MIN.) = 298.21   Tc(MIN.) = 309.06
 LONGEST FLOWPATH FROM NODE   9990.00 TO NODE   9992.00 = 10000.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   9992.00 TO NODE   9993.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   50 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.313
 GRASS FAIR COVER RUNOFF COEFFICIENT = .4500
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  84
 SUBAREA AREA(ACRES) =  774.70   SUBAREA RUNOFF(CFS) =  109.22
 TOTAL AREA(ACRES) =   774.80   TOTAL RUNOFF(CFS) =  109.34
 TC(MIN.) = 309.06
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =    774.80  TC(MIN.) =    309.06
 PEAK FLOW RATE(CFS)    =    109.34
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

Q100

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                       2003,1985,1981 HYDROLOGY MANUAL
        (c) Copyright 1982-2003 Advanced Engineering Software (aes)
            Ver. 1.5A Release Date: 01/01/2003  License ID 1499

                          Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* Otay Mesa Watershed Analysis                                            *
* 100 Year Storm Event P=1.90                                             *
* 5/20/05 AMC                                                             *
 **************************************************************************

  FILE NAME: C:\Drainage\407000\CPU100yr.DAT
  TIME/DATE OF STUDY: 11:16 05/20/2005
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   1.900
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 1.00
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *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.*

**************************************************************************
  FLOW PROCESS FROM NODE   3100.00 TO NODE   3101.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
```

```
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    106.00
 DOWNSTREAM ELEVATION(FEET) =    104.32
 ELEVATION DIFFERENCE(FEET) =      1.68
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.387
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   3101.00 TO NODE   3102.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   180.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0240
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =   3.50   Tc(MIN.) =   7.89
 LONGEST FLOWPATH FROM NODE   3100.00 TO NODE   3102.00 =  250.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3102.00 TO NODE   3103.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.730
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   19.30   SUBAREA RUNOFF(CFS) =   51.11
 TOTAL AREA(ACRES) =   19.40   TOTAL RUNOFF(CFS) =   51.37
 TC(MIN.) =   7.89

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   3110.00 TO NODE   3111.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    110.00
 DOWNSTREAM ELEVATION(FEET) =    108.25
 ELEVATION DIFFERENCE(FEET) =      1.75
```

```
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   3111.00 TO NODE   3112.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =   6.42   Tc(MIN.) =  10.75
 LONGEST FLOWPATH FROM NODE   3110.00 TO NODE   3112.00 =   400.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3112.00 TO NODE   3113.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.055
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   14.70   SUBAREA RUNOFF(CFS) =   31.89
 TOTAL AREA(ACRES) =     14.80   TOTAL RUNOFF(CFS) =   32.10
 TC(MIN.) =  10.75

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   3200.00 TO NODE   3201.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    122.00
 DOWNSTREAM ELEVATION(FEET) =    120.29
 ELEVATION DIFFERENCE(FEET) =      1.71
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.361
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
```

```
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   3201.00 TO NODE   3202.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0240
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  16.16   Tc(MIN.) =  20.52
 LONGEST FLOWPATH FROM NODE   3200.00 TO NODE   3202.00 =   900.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3202.00 TO NODE   3203.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.014
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   47.00   SUBAREA RUNOFF(CFS) =   67.20
 TOTAL AREA(ACRES) =     47.10   TOTAL RUNOFF(CFS) =   67.34
 TC(MIN.) =  20.52

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   3300.00 TO NODE   3301.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    108.00
 DOWNSTREAM ELEVATION(FEET) =    106.13
 ELEVATION DIFFERENCE(FEET) =      1.87
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.233
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   3201.00 TO NODE   3202.00 IS CODE =  51
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0267
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
  FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =  4.48   Tc(MIN.) =   8.71
  LONGEST FLOWPATH FROM NODE   3300.00 TO NODE   3202.00 =   300.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   3302.00 TO NODE   3303.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.500
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
  SUBAREA AREA(ACRES) =   11.70   SUBAREA RUNOFF(CFS) =   29.07
  TOTAL AREA(ACRES) =     11.80   TOTAL RUNOFF(CFS) =   29.32
  TC(MIN.) =   8.71

****************************************************************************
  FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
  >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE   3400.00 TO NODE   3401.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  93
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
  UPSTREAM ELEVATION(FEET) =    118.00
  DOWNSTREAM ELEVATION(FEET) =    116.20
  ELEVATION DIFFERENCE(FEET) =      1.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.287
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =     0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE   3401.00 TO NODE   3402.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
```

```
 CHANNEL LENGTH THRU SUBAREA(FEET) =   630.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0257
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  12.26   Tc(MIN.) =  16.55
 LONGEST FLOWPATH FROM NODE   3400.00 TO NODE   3402.00 =   700.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3402.00 TO NODE   3403.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.313
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   34.90   SUBAREA RUNOFF(CFS) =   57.32
 TOTAL AREA(ACRES) =     35.00   TOTAL RUNOFF(CFS) =   57.48
 TC(MIN.) =  16.55

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   3500.00 TO NODE   3501.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    110.00
 DOWNSTREAM ELEVATION(FEET) =    108.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   3501.00 TO NODE   3502.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
```

```
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =   6.42   Tc(MIN.) =  10.75
 LONGEST FLOWPATH FROM NODE   3500.00 TO NODE   3502.00 =   400.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3502.00 TO NODE   3503.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.055
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   16.40   SUBAREA RUNOFF(CFS) =   35.57
 TOTAL AREA(ACRES) =     16.50   TOTAL RUNOFF(CFS) =   35.79
 TC(MIN.) =  10.75

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   3600.00 TO NODE   3601.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    108.00
 DOWNSTREAM ELEVATION(FEET) =    106.13
 ELEVATION DIFFERENCE(FEET) =      1.87
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.233
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   3601.00 TO NODE   3602.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   230.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0267
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =   4.48   Tc(MIN.) =   8.71
 LONGEST FLOWPATH FROM NODE   3600.00 TO NODE   3602.00 =   300.00 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE   3602.00 TO NODE   3603.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.500
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =    12.10   SUBAREA RUNOFF(CFS) =   30.06
 TOTAL AREA(ACRES) =      12.20   TOTAL RUNOFF(CFS) =   30.31
 TC(MIN.) =   8.71

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   3700.00 TO NODE   3701.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    120.00
 DOWNSTREAM ELEVATION(FEET) =    118.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   3701.00 TO NODE   3702.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   730.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  14.21   Tc(MIN.) =  18.54
 LONGEST FLOWPATH FROM NODE   3700.00 TO NODE   3702.00 =   800.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   3702.00 TO NODE   3703.00 IS CODE =  81
----------------------------------------------------------------------------
```

```
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.150
STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
SOIL CLASSIFICATION IS "D"
S.C.S. CURVE NUMBER (AMC II) =  93
AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
SUBAREA AREA(ACRES) =   46.00   SUBAREA RUNOFF(CFS) =   70.22
TOTAL AREA(ACRES) =     46.10   TOTAL RUNOFF(CFS) =   70.37
TC(MIN.) =  18.54

********************************************************************************
FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
--------------------------------------------------------------------------------
>>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
================================================================================

********************************************************************************
FLOW PROCESS FROM NODE   3800.00 TO NODE   3801.00 IS CODE =  21
--------------------------------------------------------------------------------
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
SOIL CLASSIFICATION IS "D"
S.C.S. CURVE NUMBER (AMC II) =  93
INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
UPSTREAM ELEVATION(FEET) =    125.00
DOWNSTREAM ELEVATION(FEET) =    123.25
ELEVATION DIFFERENCE(FEET) =      1.75
SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      0.36
TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

********************************************************************************
FLOW PROCESS FROM NODE   3801.00 TO NODE   3802.00 IS CODE =  51
--------------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00
REPRESENTATIVE CHANNEL SLOPE =  0.0250
CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
TRAVEL TIME(MIN.) =  18.10   Tc(MIN.) =  22.43
LONGEST FLOWPATH FROM NODE   3800.00 TO NODE   3802.00 =  1000.00 FEET.

********************************************************************************
FLOW PROCESS FROM NODE   3802.00 TO NODE   3803.00 IS CODE =  81
--------------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.901
STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
```

```
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   51.30   SUBAREA RUNOFF(CFS) =   69.25
 TOTAL AREA(ACRES) =     51.40   TOTAL RUNOFF(CFS) =   69.38
 TC(MIN.) =  22.43

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2100.00 TO NODE   2101.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   70.00
 UPSTREAM ELEVATION(FEET) =    128.00
 DOWNSTREAM ELEVATION(FEET) =    126.22
 ELEVATION DIFFERENCE(FEET) =      1.78
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.303
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2101.00 TO NODE   2102.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1030.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0255
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =     0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  20.05   Tc(MIN.) =  24.35
 LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2102.00 =  1100.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2102.00 TO NODE   2103.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.803
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   33.20   SUBAREA RUNOFF(CFS) =   42.50
```

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 TOTAL AREA(ACRES) =     33.30   TOTAL RUNOFF(CFS) =   42.63
 TC(MIN.) =  24.35

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2200.00 TO NODE   2201.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    163.00
 DOWNSTREAM ELEVATION(FEET) =    161.24
 ELEVATION DIFFERENCE(FEET) =      1.76
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.319
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2201.00 TO NODE   2202.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2430.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0252
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  47.30   Tc(MIN.) =  51.62
 LONGEST FLOWPATH FROM NODE   2200.00 TO NODE   2202.00 =  2500.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2202.00 TO NODE   2203.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.111
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =  126.10   SUBAREA RUNOFF(CFS) =   99.43
 TOTAL AREA(ACRES) =    126.20   TOTAL RUNOFF(CFS) =   99.51
 TC(MIN.) =  51.62

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

```
 FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    2180.00 TO NODE    2181.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =     70.00
 UPSTREAM ELEVATION(FEET) =     130.00
 DOWNSTREAM ELEVATION(FEET) =     128.25
 ELEVATION DIFFERENCE(FEET) =       1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =       0.36
 TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.36

****************************************************************************
 FLOW PROCESS FROM NODE    2181.00 TO NODE    2182.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  22.00   Tc(MIN.) =  26.32
 LONGEST FLOWPATH FROM NODE   2180.00 TO NODE   2182.00 =  1200.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2182.00 TO NODE    2183.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.715
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   97.00   SUBAREA RUNOFF(CFS) =  118.10
 TOTAL AREA(ACRES) =     97.10   TOTAL RUNOFF(CFS) =  118.22
 TC(MIN.) =  26.32

****************************************************************************
 FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

```
****************************************************************************
 FLOW PROCESS FROM NODE   2190.00 TO NODE   2191.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    110.00
 DOWNSTREAM ELEVATION(FEET) =    108.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2191.00 TO NODE   2192.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =   6.42   Tc(MIN.) =  10.75
 LONGEST FLOWPATH FROM NODE   2190.00 TO NODE   2192.00 =   400.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2192.00 TO NODE   2193.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.055
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   27.60   SUBAREA RUNOFF(CFS) =   59.87
 TOTAL AREA(ACRES) =     27.70   TOTAL RUNOFF(CFS) =   60.09
 TC(MIN.) =  10.75

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2300.00 TO NODE   2301.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    113.00
 DOWNSTREAM ELEVATION(FEET) =    111.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

********************************************************************************
 FLOW PROCESS FROM NODE   2301.00 TO NODE   2302.00 IS CODE =  51
--------------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   450.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =   8.76   Tc(MIN.) =  13.09
 LONGEST FLOWPATH FROM NODE   2300.00 TO NODE   2302.00 =   520.00 FEET.

********************************************************************************
 FLOW PROCESS FROM NODE   2302.00 TO NODE   2303.00 IS CODE =  81
--------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.691
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   20.00   SUBAREA RUNOFF(CFS) =   38.22
 TOTAL AREA(ACRES) =   20.10   TOTAL RUNOFF(CFS) =   38.41
 TC(MIN.) =  13.09

********************************************************************************
 FLOW PROCESS FROM NODE    0.00 TO NODE    0.00 IS CODE =  13
--------------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
================================================================================

********************************************************************************
 FLOW PROCESS FROM NODE   2400.00 TO NODE   2401.00 IS CODE =  21
--------------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
```

```
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    122.00
 DOWNSTREAM ELEVATION(FEET) =    120.29
 ELEVATION DIFFERENCE(FEET) =      1.71
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.361
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2401.00 TO NODE   2402.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   830.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0244
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  16.16   Tc(MIN.) =  20.52
 LONGEST FLOWPATH FROM NODE   2400.00 TO NODE   2402.00 =   900.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2402.00 TO NODE   2403.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.014
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   67.70   SUBAREA RUNOFF(CFS) =   96.79
 TOTAL AREA(ACRES) =   67.80   TOTAL RUNOFF(CFS) =   96.94
 TC(MIN.) =  20.52

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2500.00 TO NODE   2501.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    130.00
 DOWNSTREAM ELEVATION(FEET) =    128.25
```

```
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2501.00 TO NODE   2502.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  22.00   Tc(MIN.) =  26.32
 LONGEST FLOWPATH FROM NODE   2500.00 TO NODE   2502.00 =  1200.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2502.00 TO NODE   2503.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.715
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   40.70   SUBAREA RUNOFF(CFS) =  49.55
 TOTAL AREA(ACRES) =     40.80   TOTAL RUNOFF(CFS) =   49.67
 TC(MIN.) =  26.32

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2600.00 TO NODE   2601.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    130.00
 DOWNSTREAM ELEVATION(FEET) =    128.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2601.00 TO NODE   2602.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1130.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  22.00   Tc(MIN.) =  26.32
 LONGEST FLOWPATH FROM NODE   2600.00 TO NODE   2602.00 =  1200.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2602.00 TO NODE   2603.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.715
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   34.70   SUBAREA RUNOFF(CFS) =   42.25
 TOTAL AREA(ACRES) =     34.80   TOTAL RUNOFF(CFS) =   42.37
 TC(MIN.) =  26.32

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2700.00 TO NODE   2701.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    105.00
 DOWNSTREAM ELEVATION(FEET) =    103.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

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

```
 FLOW PROCESS FROM NODE   2701.00 TO NODE   2702.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   130.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =   2.53   Tc(MIN.) =   6.86
 LONGEST FLOWPATH FROM NODE   2700.00 TO NODE   2702.00 =   200.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2702.00 TO NODE   2703.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.083
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   14.80   SUBAREA RUNOFF(CFS) =   42.90
 TOTAL AREA(ACRES) =     14.90   TOTAL RUNOFF(CFS) =   43.19
 TC(MIN.) =   6.86

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2800.00 TO NODE   2801.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    128.00
 DOWNSTREAM ELEVATION(FEET) =     26.22
 ELEVATION DIFFERENCE(FEET) =    101.78
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.726
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2801.00 TO NODE   2802.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1030.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  20.05   Tc(MIN.) =  22.78
 LONGEST FLOWPATH FROM NODE   2800.00 TO NODE   2802.00 =  1100.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2802.00 TO NODE   2803.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.883
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   81.20   SUBAREA RUNOFF(CFS) =  108.53
 TOTAL AREA(ACRES) =     81.30   TOTAL RUNOFF(CFS) =  108.67
 TC(MIN.) =  22.78

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
================================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2900.00 TO NODE   2901.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    118.00
 DOWNSTREAM ELEVATION(FEET) =    116.20
 ELEVATION DIFFERENCE(FEET) =      1.80
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.287
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2901.00 TO NODE   2902.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   630.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
```

```
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  12.26   Tc(MIN.) =  16.55
 LONGEST FLOWPATH FROM NODE   2900.00 TO NODE   2902.00 =   700.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2902.00 TO NODE   2903.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.313
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   36.80   SUBAREA RUNOFF(CFS) =   60.44
 TOTAL AREA(ACRES) =     36.90   TOTAL RUNOFF(CFS) =   60.60
 TC(MIN.) =  16.55

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2910.00 TO NODE   2911.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    108.00
 DOWNSTREAM ELEVATION(FEET) =    106.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2911.00 TO NODE   2912.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  230.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
```

```
 TRAVEL TIME(MIN.) =   4.48   Tc(MIN.) =   8.80
 LONGEST FLOWPATH FROM NODE   2910.00 TO NODE   2912.00 =   300.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2912.00 TO NODE   2913.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.475
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   12.80   SUBAREA RUNOFF(CFS) =   31.58
 TOTAL AREA(ACRES) =     12.90   TOTAL RUNOFF(CFS) =   31.83
 TC(MIN.) =   8.80

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2100.00 TO NODE   2101.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    160.00
 DOWNSTREAM ELEVATION(FEET) =    158.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2101.00 TO NODE   2102.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2330.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  45.35   Tc(MIN.) =  49.68
 LONGEST FLOWPATH FROM NODE   2100.00 TO NODE   2102.00 =  2400.00 FEET.

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

```
 FLOW PROCESS FROM NODE   2102.00 TO NODE   2103.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.138
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =  128.30   SUBAREA RUNOFF(CFS) =  103.70
 TOTAL AREA(ACRES) =    128.40   TOTAL RUNOFF(CFS) =  103.78
 TC(MIN.) =  49.68

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2110.00 TO NODE   2111.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    143.00
 DOWNSTREAM ELEVATION(FEET) =    141.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2111.00 TO NODE   2112.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  1630.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  31.73   Tc(MIN.) =  36.06
 LONGEST FLOWPATH FROM NODE   2110.00 TO NODE   2112.00 =  1700.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2112.00 TO NODE   2113.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
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```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.400
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =  275.50   SUBAREA RUNOFF(CFS) =  273.81
 TOTAL AREA(ACRES) =    275.60   TOTAL RUNOFF(CFS) =  273.91
 TC(MIN.) =  36.06

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2120.00 TO NODE   2121.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    113.00
 DOWNSTREAM ELEVATION(FEET) =  111.25
 ELEVATION DIFFERENCE(FEET) =    1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =   4.328
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2121.00 TO NODE   2122.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   430.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00  "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =   8.37   Tc(MIN.) =  12.70
 LONGEST FLOWPATH FROM NODE   2120.00 TO NODE   2122.00 =   500.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2122.00 TO NODE   2123.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.744
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
```

```
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =    23.50   SUBAREA RUNOFF(CFS) =    45.79
 TOTAL AREA(ACRES) =      23.60   TOTAL RUNOFF(CFS) =    45.98
 TC(MIN.) =  12.70

****************************************************************************
 FLOW PROCESS FROM NODE       0.00 TO NODE       0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    2130.00 TO NODE    2131.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =     70.00
 UPSTREAM ELEVATION(FEET) =     115.00
 DOWNSTREAM ELEVATION(FEET) =     113.25
 ELEVATION DIFFERENCE(FEET) =       1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =       0.36
 TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.36

****************************************************************************
 FLOW PROCESS FROM NODE    2131.00 TO NODE    2132.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   530.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  10.32   Tc(MIN.) =  14.64
 LONGEST FLOWPATH FROM NODE    2130.00 TO NODE    2132.00 =    600.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    2132.00 TO NODE    2133.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.503
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =    61.40   SUBAREA RUNOFF(CFS) =  109.12
 TOTAL AREA(ACRES) =      61.50   TOTAL RUNOFF(CFS) =  109.30
 TC(MIN.) =  14.64
```

```
****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2140.00 TO NODE   2141.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    125.00
 DOWNSTREAM ELEVATION(FEET) =    123.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2141.00 TO NODE   2142.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   930.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  18.10   Tc(MIN.) =  22.43
 LONGEST FLOWPATH FROM NODE   2140.00 TO NODE   2142.00 =  1000.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2142.00 TO NODE   2143.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.901
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   48.30   SUBAREA RUNOFF(CFS) =   65.20
 TOTAL AREA(ACRES) =    48.40   TOTAL RUNOFF(CFS) =   65.33
 TC(MIN.) =  22.43

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
```

```
 FLOW PROCESS FROM NODE   2160.00 TO NODE   2161.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    160.00
 DOWNSTREAM ELEVATION(FEET) =    158.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2161.00 TO NODE   2162.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2330.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET):=   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR =0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  45.35   Tc(MIN.) =  49.68
 LONGEST FLOWPATH FROM NODE   2160.00 TO NODE   2162.00 =  2400.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2162.00 TO NODE   2163.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.138
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =  121.60   SUBAREA RUNOFF(CFS) =   98.28
 TOTAL AREA(ACRES) =   121.70   TOTAL RUNOFF(CFS) =   98.36
 TC(MIN.) =  49.68

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   2170.00 TO NODE   2171.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
 UPSTREAM ELEVATION(FEET) =    175.00
 DOWNSTREAM ELEVATION(FEET) =    173.25
 ELEVATION DIFFERENCE(FEET) =      1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.36
 TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
 FLOW PROCESS FROM NODE   2171.00 TO NODE   2172.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2930.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0250
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      0.36
 FLOW VELOCITY(FEET/SEC.) =   0.86   FLOW DEPTH(FEET) =   0.04
 TRAVEL TIME(MIN.) =  57.03   Tc(MIN.) =  61.36
 LONGEST FLOWPATH FROM NODE   2170.00 TO NODE   2172.00 =  3000.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE   2172.00 TO NODE   2173.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.993
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =   60.20   SUBAREA RUNOFF(CFS) =   42.46
 TOTAL AREA(ACRES) =     60.30   TOTAL RUNOFF(CFS) =   42.53
 TC(MIN.) =  61.36

****************************************************************************
 FLOW PROCESS FROM NODE      0.00 TO NODE      0.00 IS CODE =  13
----------------------------------------------------------------------------
 >>>>>CLEAR THE MAIN-STREAM MEMORY<<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE   9990.00 TO NODE   9991.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    70.00
```

```
 UPSTREAM ELEVATION(FEET) =    1300.00
 DOWNSTREAM ELEVATION(FEET) =    1298.25
 ELEVATION DIFFERENCE(FEET) =       1.75
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =     4.328
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.006
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =       0.36
 TOTAL AREA(ACRES) =       0.10   TOTAL RUNOFF(CFS) =       0.36

****************************************************************************
 FLOW PROCESS FROM NODE    9991.00 TO NODE    9992.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =  9930.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0300
 CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =  50.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.36
 FLOW VELOCITY(FEET/SEC.) =    0.86   FLOW DEPTH(FEET) =    0.04
 TRAVEL TIME(MIN.) = 193.29   Tc(MIN.) = 197.62
 LONGEST FLOWPATH FROM NODE    9990.00 TO NODE    9992.00 = 10000.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    9992.00 TO NODE    9993.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.467
 STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .7100
 SOIL CLASSIFICATION IS "D"
 S.C.S. CURVE NUMBER (AMC II) =  93
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.7100
 SUBAREA AREA(ACRES) =  774.70   SUBAREA RUNOFF(CFS) =  256.98
 TOTAL AREA(ACRES) =    774.80   TOTAL RUNOFF(CFS) =  257.02
 TC(MIN.) = 197.62
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)      =    774.80  TC(MIN.) =    197.62
 PEAK FLOW RATE(CFS)    =    257.02
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

Appendix B

- HEC-1 Model

OTAY CPU HEC-1 12-21-04

```
1*****************************************
*****************************************
 *                                       *                                       *
 *                                       *                                       *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *                                       *    U.S. ARMY CORPS OF
ENGINEERS
 *                                       *                                       *    HYDROLOGIC ENGINEERING
CENTER
 *                                       *                                       *         609 SECOND
STREET
 *                                       *                                       *       DAVIS, CALIFORNIA
95616
 *  RUN DATE   21DEC04  TIME  07:23:00   *                                       *            (916) 756-1104
 *                                       *                                       *
 *                                       *
 *****************************************
*****************************************

                                    X     X  XXXXXXX   XXXXX          X
                                    X     X  X        X     X        XX
                                    X     X  X        X              X
                                    XXXXXXX  XXXX     X        XXXXX X
                                    X     X  X        X              X
                                    X     X  X        X     X        X
                                    X     X  XXXXXXX   XXXXX        XXX

 THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.
 THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT
STRUCTURE.
 THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77
VERSION
 NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
 DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL   LOSS RATE:GREEN AND AMPT INFILTRATION
 KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1                                        HEC-1 INPUT                                                    PAGE  1

 LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

               *DIAGRAM
    1          ID  .....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
    2          ID
    3          ID       ****************************************************************
    4          ID       OTAY MESA HYDROLOGY
    5          ID       ****************************************************************
    6          ID
    7          ID       KIMLEY-HORN AND ASSOCIATES, INC.
    8          ID       100 YEAR, 6 HOUR STORM EVENT
    9          ID       FILE: IN"9300WDB-SD-IN2.TXT OUT 9300WDB-015
   10          ID       LSM 8-31-98, MODIFIED 7-27-99 BY SLM
   11          ID
   12          IT       2                    300
   13          IO       0

   14          KK      A1  RUNOFF HYDROGRAPH
   15          BA   0.075
   16          PB    2.95
   17          PI  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024
   18          PI  0.0024  0.0024  0.0024  0.0024  0.0024  0.0031  0.0031  0.0031  0.0031  0.0031
   19          PI  0.0031  0.0031  0.0031  0.0031  0.0031  0.0031  0.0031  0.0031  0.0031  0.0031
   20          PI  0.0037  0.0037  0.0037  0.0037  0.0037  0.0037  0.0037  0.0037  0.0037  0.0037
   21          PI  0.0037  0.0037  0.0037  0.0037  0.0037  0.0047  0.0047  0.0047  0.0053  0.0053
   22          PI  0.0053  0.0057  0.0057  0.0057  0.0067  0.0067  0.0067  0.0083  0.0083  0.0083
   23          PI  0.0150  0.0180  0.0270  0.0380  0.0440  0.0420  0.0360  0.0280  0.0220  0.0220
   24          PI  0.0200  0.0180  0.0160  0.0140  0.0110  0.0083  0.0083  0.0083  0.0077  0.0077
   25          PI  0.0077  0.0073  0.0073  0.0073  0.0067  0.0067  0.0067  0.0053  0.0053  0.0053
   26          PI  0.0048  0.0048  0.0048  0.0048  0.0048  0.0048  0.0048  0.0048  0.0048  0.0048
   27          PI  0.0048  0.0048  0.0048  0.0048  0.0048  0.0038  0.0038  0.0038  0.0038  0.0038
   28          PI  0.0038  0.0038  0.0038  0.0038  0.0038  0.0038  0.0038  0.0038  0.0038  0.0038
   29          PI  0.0032  0.0032  0.0032  0.0032  0.0032  0.0032  0.0032  0.0032  0.0032  0.0032
   30          PI  0.0032  0.0032  0.0032  0.0032  0.0032  0.0028  0.0028  0.0028  0.0028  0.0028
   31          PI  0.0028  0.0028  0.0028  0.0028  0.0028  0.0028  0.0028  0.0028  0.0028  0.0028
   32          PI  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025
   33          PI  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025  0.0025
   34          PI  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024  0.0024
   35          LS            83.9
   36          UD   0.140

   37          KK      A7  RUNOFF HYDROGRAPH
   38          BA   0.033
   39          PB    2.90
   40          LS            88.8
   41          UD   0.062

   42          KK      01  RUNOFF HYDROPGRAPH
   43          BA   0.228
   44          PB    2.90
   45          LS            83.9
   46          UD   0.262

1                                        HEC-1 INPUT                                                    PAGE  2
```

```
LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  47      KK   CP-01  COMBINE HYDROPGRAPHS FROM A1, A7, AND 01
  48      HC       3

  49      KK  CP-A15  ROUTE FROM CP 01
  50      RK    1800   0.009    0.20            TRAP     100      20

  51      KK      A5  RUNOFF HYDROGRAPH
  52      BA   0.062
  53      PB    3.00
  54      LS            83.9
  55      UD   0.062

  56      KK  CP-A10  ROUTE FROM A5
  57      RK    1320   0.003   0.013            TRAP      35       0

  58      KK     A10  RUNOFF HYDROGRAPH
  59      BA   0.082
  60      PB    2.90
  61      LS            88.8
  62      UD   0.042

  63      KK  CP-A10  COMBINE HYDROGRAPHS FROM A5 AND A10
  64      HC       2

  65      KK  CP-A15  ROUTE FROM CP A10
  66      RK    1320   0.011   0.017            TRAP      50      20

  67      KK     A15  RUNOFF HYDROGRAPH
  68      BA   0.098
  69      PB    2.80
  70      LS            89.9
  71      UD   0.087

  72      KK  CP-A15  COMBINE HYDROGRAPHS FROM CP-01, CP-A10, AND A15
  73      HC       3

  74      KK  CP-A20  ROUTE FROM CP-A15
  75      RK    3400   0.006   0.020            TRAP     200      20

  76      KK      05  RUNOFF HYDROGRAPH FROM 05
  77      BA   0.097
  78      PB    2.75
  79      LS            83.9
  80      UD   0.080

  81      KK  CP-A20  ROUTE FROM 05
  82      RK    3500  0.006    0.020            TRAP     200      20

  83      KK     A20  RUNOFF HYDROGRAPH
  84      BA   0.254
  85      PB    2.75
  86      LS            88.4
  87      UD   0.184

1                                  HEC-1 INPUT                                  PAGE  3

LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  88      KK     A25  RUNOFF FROM A25
  89      BA   0.030
  90      PB    2.60
  91      LS            88.4
  92      UD   0.076

  93      KK     A27  RUNOFF HYDROGRAPH
  94      BA   0.021
  95      PB    2.60
  96      LS            93.8
  97      UD   0.041

  98      KK  CP-A20  COMBINE HYDROGRAPHS FROM CP-A15, 05, A25, A27, AND A20
  99      HC       5

 100      KK  CP-A25 ROUTE FROM CP-A20
 101      RK    1200   0.005    0.02            TRAP      20       2

 102      KK     A23  RUNOFF HYDROGRAPH FROM A23
 103      BA   0.051
 104      PB    2.60
 105      LS            93.8
 106      UD   0.058

 107      KK  CP-A25  ROUTE FROM A23
 108      RK     525   0.005   0.013            CIRC     3.5

 109      KK  CP-A25 COMBINE HYDROGRAPHS FROM A23, CP-A20
 110      HC       2

 111      KK  CP-A30 ROUTE FROM CP-A25
 112      RK    1100   0.005   0.020            TRAP      20       2

 113      KK     O25  RUNOFF HYDROGRAPH
 114      BA   0.134
 115      PB    2.60
 116      LS            83.9
 117      UD   0.228

 118      KK     O20  RUNOFF HYDROGRAPH
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119          BA   0.263
120          PB    2.70
121          LS            83.9
122          UD   0.294

123          KK  CP-O30  ROUTE FROM O20
124          RK     900   0.001   0.020            TRAP     200      20

125          KK     O30  RUNOFF HYDROGRAPH
126          BA   0.129
127          PB    2.50
128          LS            83.9
129          UD   0.258
1                                      HEC-1 INPUT                                          PAGE  4
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9.....10

130          KK  CP-O30  COMBINE HYDROGRAPHS FROM O25, O20 AND O30
131          HC       3

132          KK  CP-O45 ROUTE FROM O30
133          RK     600   0.007   0.030            TRAP      70       0

134          KK     045  RUNOFF HYDROGRAPH
135          BA   0.079
136          PB    2.50
137          LS            93.8
138          UD   0.137

139          KK  CP-045  COMBINE HYDROGRAPHS FROM 045, CP-030
140          HC       2

141          KK  CP-050 ROUTE FROM CP-045
142          RK    2100   0.007   0.015            TRAP      70       0

143          KK     057  RUNOFF HYDROGRAPH
144          BA   0.527
145          PB    2.45
146          LS            93.8
147          UD   0.171

148          KK  CP-050
149          RK    5900   0.007   0.015            TRAP      70       0

150          KK     050  RUNOFF HYDROGRAPH
151          BA   0.463
152          PB    2.45
153          LS            93.8
154          UD   0.185

155          KK  CP-050  COMBINE HYDROGRAPHS FROM  CP-045, 057, 050
156          HC       3

157          KK  CP-010  ROUTE FROM CP-050
158          RK    1000   0.007   0.015

159          KK     010  RUNOFF HYDROGRAPH
160          BA   0.081
161          PB    2.75
162          LS            83.9
163          UD   0.087

164          KK  CP-010  COMBINE HYDROGRAPHS FROM 010,CP-050
165          HC            83.9

166          KK  CP-036  ROUTE FROM CP-010
167          RK    2100   0.007   0.015            TRAP      70       0
1                                      HEC-1 INPUT                                          PAGE  5
LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9.....10

168          KK     036  RUNOFF HYDROGRAPH
169          BA   0.116
170          PB    2.60
171          LS            93.8
172          UD   0.088

173          KK     060
174          BA   0.146
175          PB    2.40
176          LS            84.2
177          UD   0.086

178          KK  CP-036 ROUTE FROM CP-060
179          RK     500   0.007   0.015            TRAP      30       0

180          KK  CP-036  COMBINE HYDROGRAPHS FROM 060, 036, CP-010
181          HC       3

182          KK  CP-A30  ROUTE FROM CP-036
183          RK    1700   0.002   0.002   0.040    TRAP      30       0

184          KK     A30  RUNOFF HYDROGRAPH
185          BA   0.070
186          PB    2.50
187          LS            90.5
188          UD   0.083

189          KK  CP-A30  COMBINE HYDROGRAPHS FROM A30, CP-036, CP-A25
```

```
190          HC       3

191          KK  CP-A31  ROUTE FROM CP-A30
192          RK    1000   0.002   0.040            TRAP      30       0

193          KK     A28  RUNOFF HYDROGRAPH
194          BA   0.021
195          PB    2.60
196          LS            93.8
197          UD   0.041

198          KK  CP-A31  RUNOFF HYDROGRAPH
199          RK    1200   0.005    0.02            TRAP      10       2

200          KK     A31  RUNOFF HYDROGRAPH
201          BA   0.047
202          PB    2.60
203          LS            93.8
204          UD   0.063

205          KK  CP-A31  COMBINE HYDROGRAPHS FROM CP-A30, A28, A31
206          HC       3
1                                        HEC-1 INPUT                                                    PAGE  6

LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

207          KK  CP-S1A  ROUTE FROM CP-A31
208          RK    2600   0.002   0.040            TRAP      30       2

209          KK     B10
210          KM            BASIN 10
211          BA   .0067
212          PB     2.0
213          LS        0      91       61
214          UD    .004

215          KK     B20
216          KM            BASIN 20
217          BA   .0055
218          LS        0      89       52
219          UD    .007

220          KK     C12         COMBINE B10 & B20
221          HC       2

222          KK      C2         ROUTE CHANNEL NUMBER 2
223          UK     150    .020     .08      100
224          RK     620    .005    .035            TRAP      30       4

225          KK     B30
226          KM            BASIN 30
227          BA   .0052
228          LS        0      89       43
229          UD    .005

230          KK     C23         COMBINE B20 OUT & B30
231          HC       2

232          KK      C3         ROUTE CHANNEL NUMBER 3
233          RK    1100    .005    .035            TRAP      30       4

234          KK     B40
235          KP       1
236          KM            BASIN 40
237          BA   .0942
238          LS        0      91       60
239          UD    .024

240          KK    SD43          ROUTE B40 THROUGH B30: STORM DRAIN
241          UK    1050    .020     .08      100
242          RK     800    .015    .015            CIRC     5.5

243          KK     B50
244          KP       1
245          KM            BASIN 50
246          BA   .0781
247          LS        0      90       60
248          UD    .019
1                                        HEC-1 INPUT                                                    PAGE  7

LINE         ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

249          KK     C45          COMBINE B40 & B50 @ B30
250          HC       2

251          KK     CP4
252          BA    .032
253          UK     250    .012     .08      100
254          RK    1320    .015    .015            CIRC       6            YES

255          KK    CCP4
256          KM         COMBINE AT  CONC. PT. 4
257          HC       2

258          KK     CP3
259          KM          ROUTE TO CONC. PT. 3
260          BA    .040
261          UK     650    .011     .08      100
262          RK    1320    .015    .015            CIRC       6            YES
```

```
263          KK    CCP3
264          KM        COMBINE AT CONC. PT. 3
265          HC       2

266          KK     MX1
267          KM        MEXICO BASIN 1
268          BA   .0316
269          LS        0      90      60
270          UD    .007

271          KK     MX2
272          KM        MEXICO BASIN 2
273          BA   .0781
274          LS        0      89      50
275          UD    .019

276          KK    MX12
277          KM        COMBINE MEXICO AND BORDER AREA
278          HC       2

279          KK   MX123
280          KM        ROUTE TO CP3A
281          RK     600    .015    .015            CIRC       5

282          KK     MX3
283          KM        BORDER CORRIDOR
284          BA   .0215
285          LS        0      88      30
286          UD    .005

287          KK    CP3A
288          KM        COMBINE AT CONC. PT. 3A
289          HC       2
1                                        HEC-1 INPUT                                                    PAGE  8

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

290          KK    RCP3
291          KM        ROUTE TO CONC. PT. 3A
292          RK     750    .015    .015            CIRC       5

293          KK    CCP3
294          KM        COMBINE AT CONC. PT. 3
295          HC       2

296          KK    RCP2
297          KM        ROUTE TO CONC. PT. 2
298          RK     400    .015    .015            CIRC       7

299          KK     RP2
300          KM        RUNOFF TO CONC. PT. 2
301          BA   .0473
302          UK     550    .012     .08     100
303          RK    1200    .015    .015            CIRC       4

304          KK    CCP2
305          KM        COMBINEAT CONC. PT. 2
306          HC       2

307          KK    SVRW
308          KM        SIEMPRE VIVA RD WATESHED
309          BA   .0646
310          UK     450    .015     .08     100
311          RK    3000    .015    .015            CIRC       5

312          KK      EB
313          KM        WATESHED EAST OF PREVIOUS DET. BASIN
314          BA   .0102
315          UK     250    .010     .08     100
316          RK     100    .015    .015            CIRC       2

317          KK      WB
318          KM        WATERSHED WEST OF PREVIOUS DET. BASIN
319          BA   .0158
320          UK     400    .010     .08     100
321          RK     100    .015    .015            CIRC       2

322          KK    WSVR
323          KM        WEST SIEMPRE VIVA RD.
324          BA   .0108
325          UK     350    .012     .08     100
326          RK     600    .015    .015            CIRC       4

327          KK     CP1
328          HC       5
1                                        HEC-1 INPUT                                                    PAGE  9

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

329          KK      S1  RUNOFF HYDROGRAPH
330          BA   0.516
331          PB    2.70
332          LS            93.8
333          UD   0.143

334          KK   CP-S1  COMBINE HYDROGRAPHS FROM B10, CP1 AND S1
335          HC       3
```

```
336          KK  CP-S1A  COMBINE HYDROGRAPHS FROM CP-S1, CP-A31
337          HC       2
338          KK  CP-S10  ROUTE FROM CP-S1A
339          RK    1300   0.004   0.004            TRAP      30       0
340          KK     A60  RUNOFF HYDROGRAPH
341          BA   0.033
342          PB    2.30
343          LS             93.8
344          UD   0.039
345          KK  CP-A50  ROUTE FROM A60
346          RK    3000   0.005   0.013            CIRC       2
347          KK     055  RUNOFF HYDROGRAPH
348          BA   0.482
349          PB    2.35
350          LS             91.7
351          UD   0.140
352          KK  CP-A50  ROUTE FROM 055
353          RK    2900   0.004   0.013            TRAP      15       0
354          KK     A50  RUNOFF HYDROGRAPH
355          BA   0.250
356          PB    2.35
357          LS             93.8
358          UD   0.121
359          KK  CP-A50  COMBINE HYDROGRAPHS FROM A60, 055, AND A50
360          HC       3
361          KK     A50
362          DT     A50
363          DI       0     615    1000
364          DQ       0    0.01     385
365          KK     A42  RUNOFF HYDROGRAPH
366          BA   0.032
367          PB    2.40
368          LS             93.8
369          UD   0.046

1                                        HEC-1 INPUT                                                    PAGE 10

LINE         ID.......1.....2.....3.....4.....5.....6.....7.....8.....9.....10

370          KK  CP-A50  COMBINE HYDROGRAPHS FROM A50 AND A42
371          HC       2
372          KK  CP-A45  ROUTE FROM CP-A50
373          RK    3000   0.002   0.040            TRAP      40       1
374          KK     A40  RUNOFF HYDROGRAPH
375          BA   0.032
376          PB    2.40
377          LS             93.8
378          UD   0.057
379          KK  CP-A45  ROUTE FROM A40
380          RK    2380   0.006   0.040            TRAP      40       1
381          KK     A35  RUNOFF HYDROGRAPH
382          BA   0.065
383          PB    2.50
384          LS             93.8
385          UD   0.076
386          KK  CP-A45  ROUTE FROM A35
387          RK    2000   0.001   0.040            TRAP       5       1
388          KK     A45  RUNOFF HYDROGRAPH
389          BA   0.122
390          PB    2.45
391          LS             94.0
392          UD   0.112
393          KK  CP-A45  COMBINE HYDROGRAPHS FROM CP-A50, A40 AND A45
394          HC       4
395          KK     A45
396          DT     A45
397          DI       0      60    1000
398          DQ       0    0.01     940
399          KK  CP-S10  ROUTE FROM CP-A45
400          RK    2900   0.003   0.040            TRAP      25     0.8
401          KK     S10  RUNOFF FROM HYDROGRAPH
402          BA   0.263
403          PB    2.50
404          LS             94.4
405          UD   0.235
406          KK  CP-S10  COMBINE HYDROGRAPHS FROM S1-DET, CP-A45, AND S10
407          HC       3

1                                        HEC-1 INPUT                                                    PAGE 11

LINE         ID.......1.....2.....3.....4.....5.....6.....7.....8.....9.....10
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 408          KK  CP-B30  ROUTE FROM CP-S10
 409          RD    2400   0.004   0.040            TRAP      50      0.8

 410          KK     A65  RUNOFF HYDROGRAPH FROM A65
 411          BA   0.055
 412          PB    2.30
 413          LS            93.8
 414          UD   0.037

 415          KK  CP-S25 ROUTE FROM A65
 416          RK    2910   0.010   0.040            TRAP     200      20

 417          KK     S25  RUNOFF HYDROGRAPH
 418          BA   0.082
 419          PB    2.30
 420          LS            83.9
 421          UD   0.202

 422          KK  CP-S25  COMBINE HYDROGRAPHS FROM A65 AND S25
 423          HC       2

 424          KK  CP-S20  ROUTE FROM CP-S25
 425          RK    1460   0.004   0.020            TRAP      15       1

 426          KK     S20  RUNOFF HYDROGRAPH
 427          BA   0.136
 428          PB    2.30
 429          LS            83.9
 430          UD   0.176

 431          KK  CP-S20  COMBINE HYDROGRAPHS FROM CP-S25, AND S20
 432          HC       2

 433          KK  CP-B30  ROUTE FROM CP-S20
 434          RK    3500   0.004   0.040            TRAP      15       1

 435          KK     S15  RUNOFF HYDROGRAPH
 436          BA   0.128
 437          PB    2.40
 438          LS            93.8
 439          UD   0.083

 440          KK  CP-B30  ROUTE FROM S15
 441          RK    2800   0.004   0.040            TRAP      15       1

 442          KK     B20  RUNOFF HYDROGRAPH
 443          BA   0.040
 444          PB    2.30
 445          LS            93.8
 446          UD   0.051
1                                        HEC-1 INPUT                                                    PAGE 12

            LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

 447          KK  CP-B25  ROUTE FROM B20
 448          RK    1320   0.002   0.020            TRAP       8       2

 449          KK     B25  RUNOFF HYDROGRAPH
 450          BA   0.127
 451          PB    2.30
 452          LS            93.8
 453          UD   0.070

 454          KK  CP-B25  COMBINE HYDROGRAPHS FROM B20 AND B25
 455          HC       2

 456          KK  CP-B25  ROUTE FROM CP-B25
 457          RK    2700   0.001   0.040            TRAP      15       1

 458          KK     B15  RUNOFF HYDROGRAPH
 459          BA   0.074
 460          PB    2.50
 461          LS            94.5
 462          UD   0.078

 463          KK  CP-B30
 464          RK    1000   0.015  0.040             TRAP      15       1

 465          KK     B30  RUNOFF HYDROGRAPH
 466          BA   0.228
 467          PB    2.45
 468          LS            84.8
 469          UD   0.465

 470          KK  CP-B30  COMBINE HYDROGRAPHS FROM CP-S10, CP-S20, S15, CP-B25, B15 AND B30
 471          KO       1
 472          HC       6

 473          KK  DB-030  DETENTION BASIN AT BORDER
 474          RS       1    STOR
 475          SV       0      11      71     166     268     319
 476          SE       0       2       4       6       8       9
 477          SQ       0      20     150     350    1000    2200
 478          ZZ
1
          SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT
 LINE      (V) ROUTING          (--->) DIVERSION OR PUMP FLOW
```
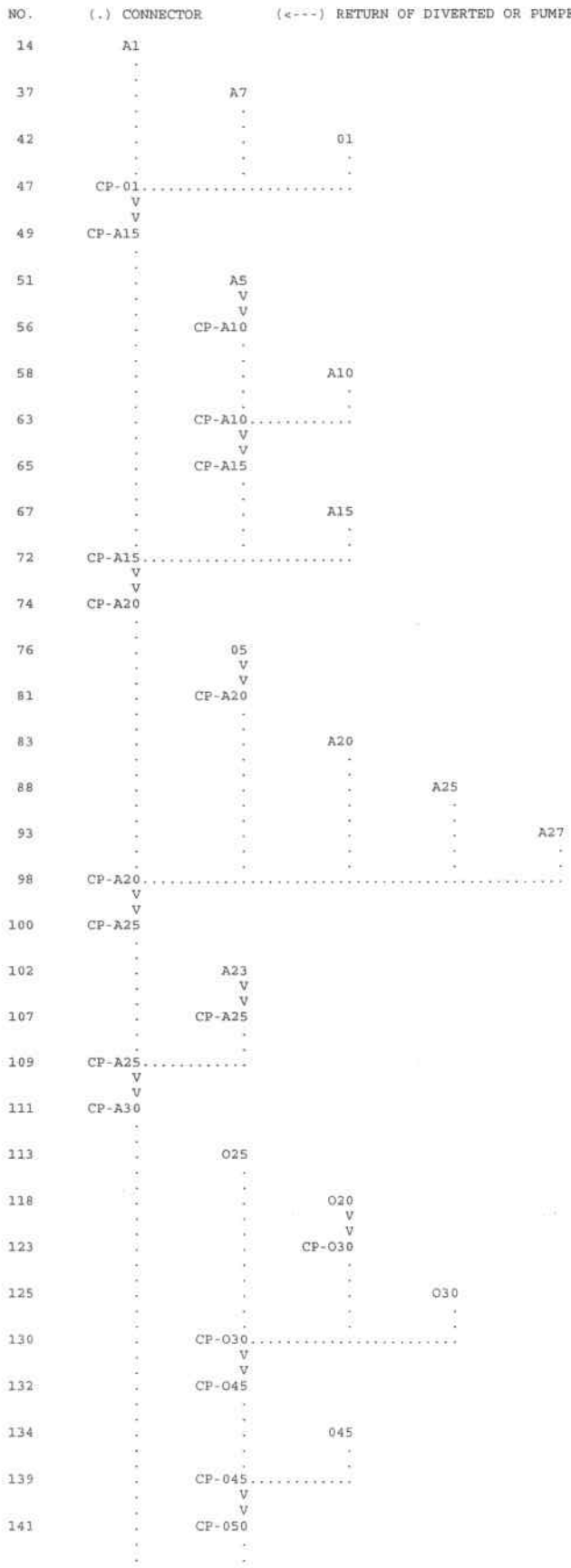
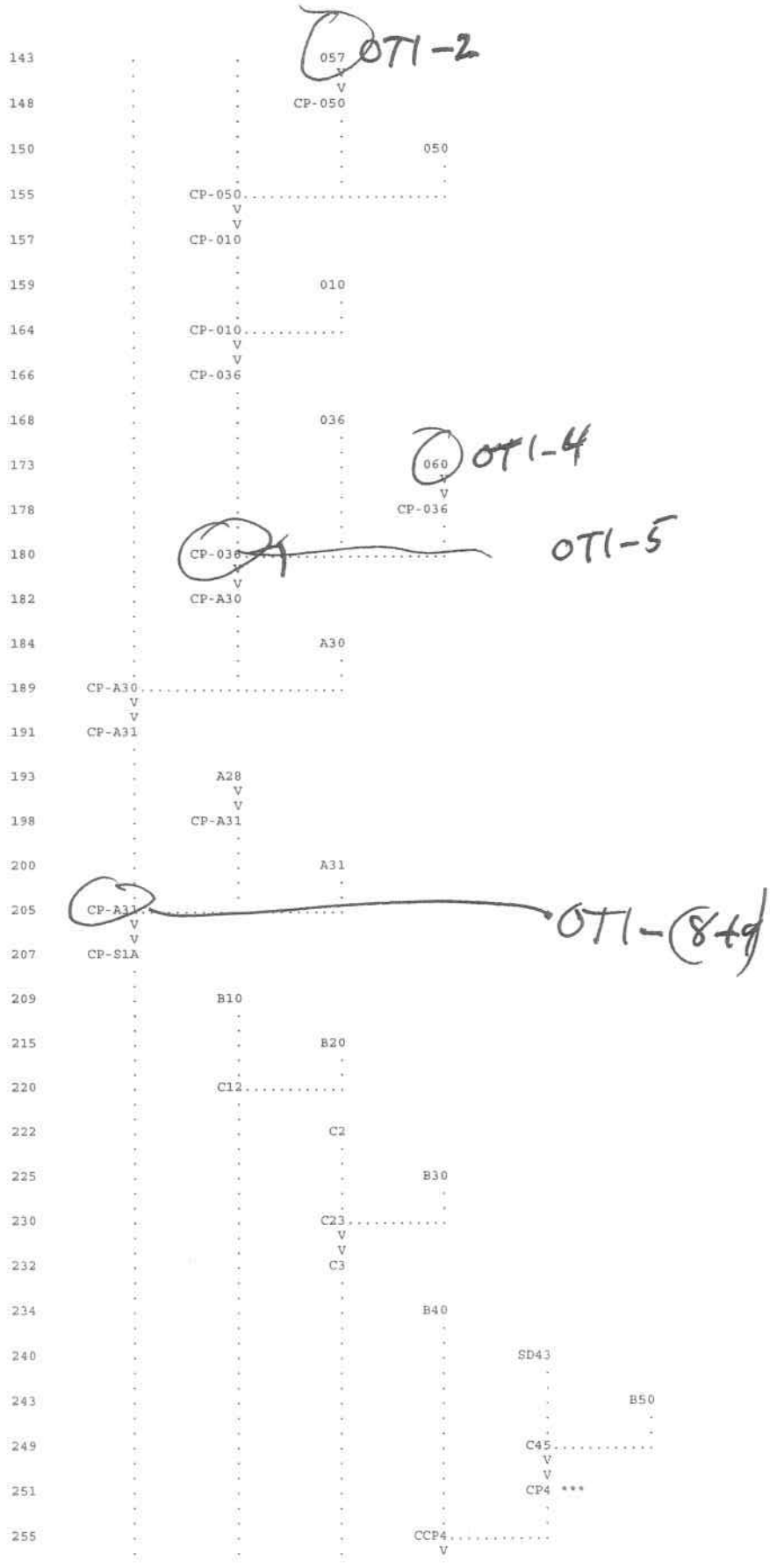
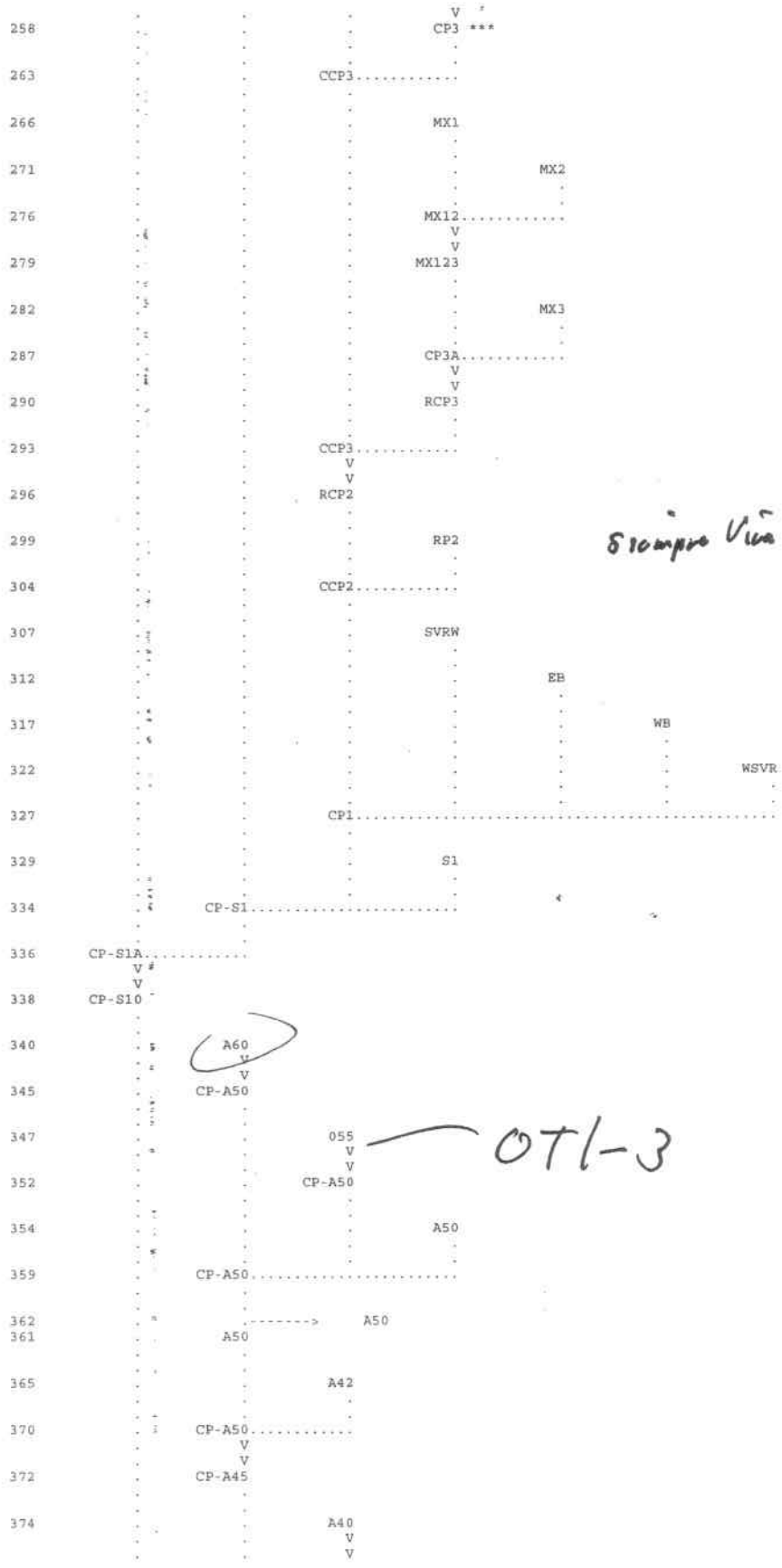
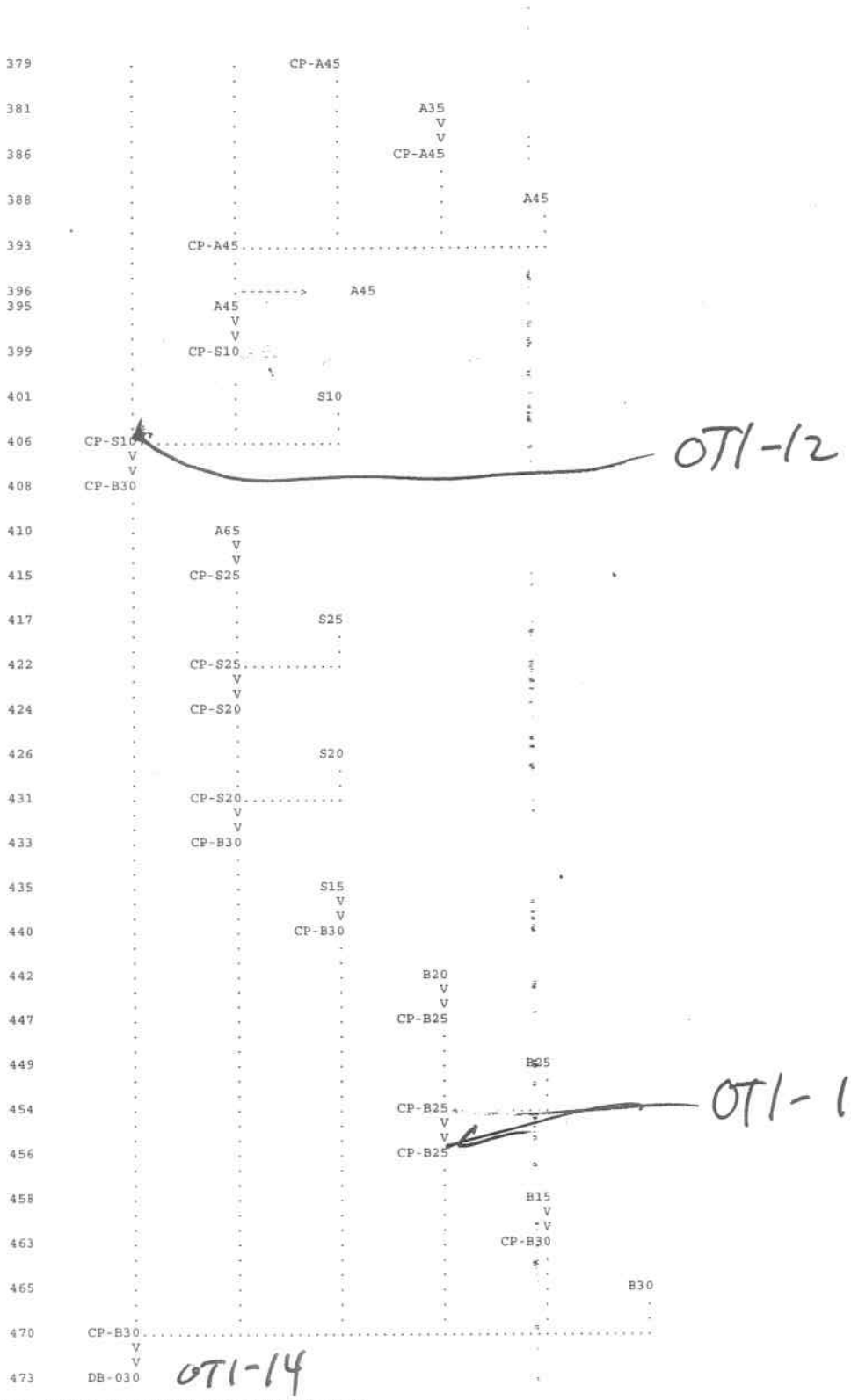


NO.
(.) CONNECTOR
(<---) RETURN OF DIVERTED OR PUMPED FLOW
14 A1
37 A7
42 01
47 CP-01
49 CP-A15
51 A5
56 CP-A10
58 A10
63 CP-A10
65 CP-A15
67 A15
72 CP-A15
74 CP-A20
76 05
81 CP-A20
83 A20
88 A25
93 A27
98 CP-A20
100 CP-A25
102 A23
107 CP-A25
109 CP-A25
111 CP-A30
113 O25
118 O20
123 CP-O30
125 O30
130 CP-O30
132 CP-O45
134 045
139 CP-045
141 CP-050


143
057
OTI-2
148
CP-050
150
050
155
CP-050
157
CP-010
159
010
164
CP-010
166
CP-036
168
036
173
060
OTI-4
178
CP-036
180
CP-036
OTI-5
182
CP-A30
184
A30
189
CP-A30
191
CP-A31
193
A28
198
CP-A31
200
A31
205
CP-A31
OTI-(8+9)
207
CP-S1A
209
B10
215
B20
220
C12
222
C2
225
B30
230
C23
232
C3
234
B40
240
SD43
243
B50
249
C45
251
CP4 ***
255
CCP4



Siempre Vía BP

OTI-3



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

1**********

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* *

* FLOOD HYDROGRAPH PACKAGE (HEC-1) *

* JUN 1998 *

* VERSION 4.1 *

* *

* U.S. ARMY CORPS OF ENGINEERS *

* HYDROLOGIC ENGINEERING CENTER *

* 609 SECOND STREET *

```
*                                   *                                   *       DAVIS, CALIFORNIA
95616       *
*  RUN DATE   21DEC04  TIME  07:23:00   *                                *           (916) 756-1104
*
*                                   *                                   *
*
 ****************************************
****************************************


                        .....1.......2.......3.......4.......5.......6.......7.......8.......9.....10
                             ****************************************************************
                             OTAY MESA HYDROLOGY
                             ****************************************************************

                             KIMLEY-HORN AND ASSOCIATES, INC.
                             100 YEAR, 6 HOUR STORM EVENT
                             FILE: IN"9300WDB-SD-IN2.TXT OUT 9300WDB-015
                             LSM 8-31-98, MODIFIED 7-27-99 BY SLM

  13 IO          OUTPUT CONTROL VARIABLES
                       IPRNT           0  PRINT CONTROL
                       IPLOT           0  PLOT CONTROL
                       QSCAL          0.  HYDROGRAPH PLOT SCALE

     IT          HYDROGRAPH TIME DATA
                        NMIN           2  MINUTES IN COMPUTATION INTERVAL
                       IDATE      1    0  STARTING DATE
                       ITIME         0000  STARTING TIME
                          NQ          300  NUMBER OF HYDROGRAPH ORDINATES
                      NDDATE      1    0  ENDING DATE
                      NDTIME         0958  ENDING TIME
                      ICENT           19  CENTURY MARK

                 COMPUTATION INTERVAL      .03 HOURS
                    TOTAL TIME BASE     9.97 HOURS

           ENGLISH UNITS
                DRAINAGE AREA          SQUARE MILES
                PRECIPITATION DEPTH    INCHES
                LENGTH, ELEVATION      FEET
                FLOW                   CUBIC FEET PER SECOND
                STORAGE VOLUME         ACRE-FEET
                SURFACE AREA           ACRES
                TEMPERATURE            DEGREES FAHRENHEIT

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

                ***************
                *             *
  473 KK        *    DB-030   *       DETENTION BASIN AT BORDER
                *             *
                ***************

                HYDROGRAPH ROUTING DATA

  474 RS          STORAGE ROUTING
                       NSTPS           1  NUMBER OF SUBREACHES
                        ITYP        STOR  TYPE OF INITIAL CONDITION
                       RSVRIC        .00  INITIAL CONDITION
                            X        .00 WORKING R AND D COEFFICIENT

  475 SV            STORAGE          .0      11.0      71.0     166.0     268.0     319.0

  476 SE            ELEVATION       .00      2.00      4.00      6.00      8.00      9.00

  477 SQ            DISCHARGE        0.       20.      150.      350.     1000.     2200.
                                                                  ***

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

                                                HYDROGRAPH AT STATION   DB-030

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

                                                  *                                                 *                                                 *
  DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE * DA MON HRMN ORD  OUTFLOW  STORAGE   STAGE * DA MON HRMN ORD  OUTFLOW
STORAGE   STAGE                                 *                                                 *
                                                  *                                                 *                                                 *
   1     0000   1       0.       .0      .0 *  1     0320 101     667.    215.7     7.0 *  1     0640 201     695.
220.1     7.1
   1     0002   2       0.       .0      .0 *  1     0322 102     682.    218.1     7.0 *  1     0642 202     688.
219.0     7.0
   1     0004   3       0.       .0      .0 *  1     0324 103     696.    220.2     7.1 *  1     0644 203     681.
217.9     7.0
   1     0006   4       0.       .0      .0 *  1     0326 104     708.    222.2     7.1 *  1     0646 204     674.
216.8     7.0
   1     0008   5       0.       .0      .0 *  1     0328 105     720.    224.1     7.1 *  1     0648 205     666.
```

215.7	7.0													
1	0010	6	0.	.0	.0 *	1	0330	106	732.	225.9	7.2 *	1	0650	206	659.
214.5	7.0													
1	0012	7	0.	.0	.0 *	1	0332	107	742.	227.5	7.2 *	1	0652	207	652.
213.3	6.9													
1	0014	8	0.	.0	.0 *	1	0334	108	752.	229.1	7.2 *	1	0654	208	644.
212.1	6.9													
1	0016	9	0.	.0	.0 *	1	0336	109	761.	230.5	7.3 *	1	0656	209	636.
210.9	6.9													
1	0018	10	0.	.1	.0 *	1	0338	110	770.	231.9	7.3 *	1	0658	210	628.
209.7	6.9													
1	0020	11	0.	.1	.0 *	1	0340	111	778.	233.2	7.3 *	1	0700	211	620.
208.4	6.8													
1	0022	12	0.	.1	.0 *	1	0342	112	786.	234.4	7.3 *	1	0702	212	612.
207.2	6.8													
1	0024	13	0.	.2	.0 *	1	0344	113	793.	235.5	7.4 *	1	0704	213	604.
205.9	6.8													
1	0026	14	0.	.2	.0 *	1	0346	114	799.	236.5	7.4 *	1	0706	214	596.
204.7	6.8													
1	0028	15	0.	.3	.0 *	1	0348	115	805.	237.5	7.4 *	1	0708	215	588.
203.4	6.7													
1	0030	16	1.	.3	.1 *	1	0350	116	811.	238.4	7.4 *	1	0710	216	580.
202.1	6.7													
1	0032	17	1.	.4	.1 *	1	0352	117	816.	239.2	7.4 *	1	0712	217	572.
200.9	6.7													
1	0034	18	1.	.4	.1 *	1	0354	118	821.	239.9	7.4 *	1	0714	218	564.
199.6	6.7													
1	0036	19	1.	.4	.1 *	1	0356	119	826.	240.6	7.5 *	1	0716	219	557.
198.4	6.6													
1	0038	20	1.	.5	.1 *	1	0358	120	830.	241.3	7.5 *	1	0718	220	549.
197.2	6.6													
1	0040	21	1.	.5	.1 *	1	0400	121	834.	241.9	7.5 *	1	0720	221	541.
195.9	6.6													
1	0042	22	1.	.6	.1 *	1	0402	122	837.	242.4	7.5 *	1	0722	222	533.
194.7	6.6													
1	0044	23	1.	.6	.1 *	1	0404	123	840.	242.9	7.5 *	1	0724	223	525.
193.5	6.5													
1	0046	24	1.	.7	.1 *	1	0406	124	843.	243.4	7.5 *	1	0726	224	518.
192.3	6.5													
1	0048	25	1.	.8	.1 *	1	0408	125	846.	243.8	7.5 *	1	0728	225	510.
191.1	6.5													
1	0050	26	1.	.8	.1 *	1	0410	126	848.	244.2	7.5 *	1	0730	226	503.
190.0	6.5													
1	0052	27	2.	.9	.2 *	1	0412	127	850.	244.5	7.5 *	1	0732	227	495.
188.8	6.4													
1	0054	28	2.	.9	.2 *	1	0414	128	852.	244.8	7.5 *	1	0734	228	488.
187.7	6.4													
1	0056	29	2.	1.0	.2 *	1	0416	129	854.	245.0	7.5 *	1	0736	229	481.
186.5	6.4													
1	0058	30	2.	1.1	.2 *	1	0418	130	855.	245.2	7.6 *	1	0738	230	474.
185.4	6.4													
1	0100	31	2.	1.2	.2 *	1	0420	131	856.	245.4	7.6 *	1	0740	231	466.
184.3	6.4													
1	0102	32	2.	1.2	.2 *	1	0422	132	857.	245.5	7.6 *	1	0742	232	459.
183.2	6.3													
1	0104	33	2.	1.3	.2 *	1	0424	133	858.	245.7	7.6 *	1	0744	233	452.
182.1	6.3													
1	0106	34	3.	1.4	.3 *	1	0426	134	858.	245.7	7.6 *	1	0746	234	446.
181.0	6.3													
1	0108	35	3.	1.5	.3 *	1	0428	135	859.	245.8	7.6 *	1	0748	235	439.
179.9	6.3													
1	0110	36	3.	1.6	.3 *	1	0430	136	859.	245.8	7.6 *	1	0750	236	432.
178.9	6.3													
1	0112	37	3.	1.8	.3 *	1	0432	137	859.	245.9	7.6 *	1	0752	237	425.
177.8	6.2													
1	0114	38	3.	1.9	.3 *	1	0434	138	859.	245.8	7.6 *	1	0754	238	419.
176.8	6.2													
1	0116	39	4.	2.0	.4 *	1	0436	139	859.	245.8	7.6 *	1	0756	239	412.
175.8	6.2													
1	0118	40	4.	2.2	.4 *	1	0438	140	858.	245.8	7.6 *	1	0758	240	406.
174.7	6.2													
1	0120	41	4.	2.4	.4 *	1	0440	141	858.	245.7	7.6 *	1	0800	241	399.
173.7	6.2													
1	0122	42	5.	2.5	.5 *	1	0442	142	857.	245.6	7.6 *	1	0802	242	393.
172.8	6.1													
1	0124	43	5.	2.7	.5 *	1	0444	143	857.	245.5	7.6 *	1	0804	243	387.
171.8	6.1													
1	0126	44	5.	2.9	.5 *	1	0446	144	856.	245.4	7.6 *	1	0806	244	381.
170.8	6.1													
1	0128	45	6.	3.1	.6 *	1	0448	145	855.	245.2	7.6 *	1	0808	245	375.
169.9	6.1													
1	0130	46	6.	3.4	.6 *	1	0450	146	854.	245.1	7.6 *	1	0810	246	369.
169.0	6.1													
1	0132	47	7.	3.6	.7 *	1	0452	147	853.	244.9	7.5 *	1	0812	247	363.
168.0	6.0													
1	0134	48	7.	3.8	.7 *	1	0454	148	851.	244.7	7.5 *	1	0814	248	357.
167.1	6.0													
1	0136	49	7.	4.1	.7 *	1	0456	149	850.	244.5	7.5 *	1	0816	249	351.
166.2	6.0													
1	0138	50	8.	4.4	.8 *	1	0458	150	849.	244.2	7.5 *	1	0818	250	349.
165.3	6.0													
1	0140	51	8.	4.6	.8 *	1	0500	151	847.	244.0	7.5 *	1	0820	251	347.
164.5	6.0													
1	0142	52	9.	4.9	.9 *	1	0502	152	846.	243.8	7.5 *	1	0822	252	345.
163.6	5.9													
1	0144	53	10.	5.2	1.0 *	1	0504	153	844.	243.5	7.5 *	1	0824	253	343.
162.7	5.9													
1	0146	54	10.	5.6	1.0 *	1	0506	154	842.	243.2	7.5 *	1	0826	254	341.
161.8	5.9													
1	0148	55	11.	6.0	1.1 *	1	0508	155	840.	243.0	7.5 *	1	0828	255	339.
161.0	5.9													

1	0150	56	12.	6.4	1.2	*	1	0510	156	839.	242.7	7.5	*	1	0830 256	338.
160.1	5.9															
1	0152	57	12.	6.8	1.2	*	1	0512	157	837.	242.4	7.5	*	1	0832 257	336.
159.2	5.9															
1	0154	58	13.	7.3	1.3	*	1	0514	158	835.	242.1	7.5	*	1	0834 258	334.
158.3	5.8															
1	0156	59	14.	7.8	1.4	*	1	0516	159	833.	241.8	7.5	*	1	0836 259	332.
157.5	5.8															
1	0158	60	15.	8.4	1.5	*	1	0518	160	831.	241.4	7.5	*	1	0838 260	330.
156.6	5.8															
1	0200	61	17.	9.1	1.7	*	1	0520	161	829.	241.1	7.5	*	1	0840 261	328.
155.8	5.8															
1	0202	62	18.	9.9	1.8	*	1	0522	162	826.	240.8	7.5	*	1	0842 262	327.
154.9	5.8															
1	0204	63	19.	10.7	1.9	*	1	0524	163	824.	240.4	7.5	*	1	0844 263	325.
154.1	5.7															
1	0206	64	21.	11.7	2.0	*	1	0526	164	822.	240.1	7.5	*	1	0846 264	323.
153.2	5.7															
1	0208	65	24.	12.8	2.1	*	1	0528	165	820.	239.7	7.4	*	1	0848 265	321.
152.4	5.7															
1	0210	66	27.	14.2	2.1	*	1	0530	166	817.	239.3	7.4	*	1	0850 266	320.
151.5	5.7															
1	0212	67	31.	16.0	2.2	*	1	0532	167	815.	238.9	7.4	*	1	0852 267	318.
150.7	5.7															
1	0214	68	36.	18.5	2.2	*	1	0534	168	812.	238.6	7.4	*	1	0854 268	316.
149.9	5.7															
1	0216	69	43.	21.7	2.4	*	1	0536	169	810.	238.2	7.4	*	1	0856 269	314.
149.0	5.6															
1	0218	70	52.	25.8	2.5	*	1	0538	170	808.	237.8	7.4	*	1	0858 270	313.
148.2	5.6															
1	0220	71	63.	30.8	2.7	*	1	0540	171	805.	237.4	7.4	*	1	0900 271	311.
147.4	5.6															
1	0222	72	76.	36.8	2.9	*	1	0542	172	803.	237.0	7.4	*	1	0902 272	309.
146.6	5.6															
1	0224	73	91.	43.7	3.1	*	1	0544	173	800.	236.7	7.4	*	1	0904 273	307.
145.8	5.6															
1	0226	74	108.	51.5	3.3	*	1	0546	174	798.	236.3	7.4	*	1	0906 274	306.
145.0	5.6															
1	0228	75	126.	59.9	3.6	*	1	0548	175	795.	235.9	7.4	*	1	0908 275	304.
144.1	5.5															
1	0230	76	145.	68.7	3.9	*	1	0550	176	793.	235.5	7.4	*	1	0910 276	302.
143.3	5.5															
1	0232	77	165.	77.9	4.1	*	1	0552	177	790.	235.1	7.4	*	1	0912 277	301.
142.5	5.5															
1	0234	78	185.	87.4	4.3	*	1	0554	178	788.	234.7	7.3	*	1	0914 278	299.
141.7	5.5															
1	0236	79	205.	97.0	4.5	*	1	0556	179	786.	234.3	7.3	*	1	0916 279	297.
141.0	5.5															
1	0238	80	225.	106.4	4.7	*	1	0558	180	783.	234.0	7.3	*	1	0918 280	296.
140.2	5.5															
1	0240	81	244.	115.6	4.9	*	1	0600	181	781.	233.6	7.3	*	1	0920 281	294.
139.4	5.4															
1	0242	82	262.	124.3	5.1	*	1	0602	182	778.	233.2	7.3	*	1	0922 282	292.
138.6	5.4															
1	0244	83	280.	132.7	5.3	*	1	0604	183	776.	232.8	7.3	*	1	0924 283	291.
137.8	5.4															
1	0246	84	296.	140.5	5.5	*	1	0606	184	773.	232.4	7.3	*	1	0926 284	289.
137.0	5.4															
1	0248	85	312.	147.8	5.6	*	1	0608	185	771.	232.1	7.3	*	1	0928 285	287.
136.3	5.4															
1	0250	86	326.	154.5	5.8	*	1	0610	186	768.	231.6	7.3	*	1	0930 286	286.
135.5	5.4															
1	0252	87	339.	160.9	5.9	*	1	0612	187	765.	231.2	7.3	*	1	0932 287	284.
134.8	5.3															
1	0254	88	355.	166.7	6.0	*	1	0614	188	762.	230.7	7.3	*	1	0934 288	283.
134.0	5.3															
1	0256	89	389.	172.2	6.1	*	1	0616	189	759.	230.1	7.3	*	1	0936 289	281.
133.2	5.3															
1	0258	90	421.	177.2	6.2	*	1	0618	190	755.	229.6	7.2	*	1	0938 290	279.
132.5	5.3															
1	0300	91	451.	181.8	6.3	*	1	0620	191	751.	228.9	7.2	*	1	0940 291	278.
131.7	5.3															
1	0302	92	478.	186.1	6.4	*	1	0622	192	747.	228.2	7.2	*	1	0942 292	276.
131.0	5.3															
1	0304	93	504.	190.2	6.5	*	1	0624	193	742.	227.5	7.2	*	1	0944 293	275.
130.3	5.2															
1	0306	94	529.	194.1	6.6	*	1	0626	194	737.	226.7	7.2	*	1	0946 294	273.
129.5	5.2															
1	0308	95	552.	197.8	6.6	*	1	0628	195	732.	225.9	7.2	*	1	0948 295	272.
128.8	5.2															
1	0310	96	575.	201.3	6.7	*	1	0630	196	726.	225.0	7.2	*	1	0950 296	270.
128.1	5.2															
1	0312	97	596.	204.6	6.8	*	1	0632	197	720.	224.1	7.1	*	1	0952 297	269.
127.3	5.2															
1	0314	98	615.	207.7	6.8	*	1	0634	198	714.	223.1	7.1	*	1	0954 298	267.
126.6	5.2															
1	0316	99	634.	210.5	6.9	*	1	0636	199	708.	222.1	7.1	*	1	0956 299	266.
125.9	5.2															
1	0318	100	651.	213.2	6.9	*	1	0638	200	701.	221.1	7.1	*	1	0958 300	264.
125.2	5.1					*							*			

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	9.97-HR
(CFS)	(HR)					
		(CFS)				
859.	4.53		658.	441.	441.	441.
		(INCHES)	.954	1.061	1.061	1.061

	(AC-FT)	326.	363.	363.	363.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE			
		6-HR	24-HR	72-HR	9.97-HR
+ (AC-FT)	(HR)				
246.	4.53	214.	150.	150.	150.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE			
		6-HR	24-HR	72-HR	9.97-HR
+ (FEET)	(HR)				
7.57	4.53	6.94	5.16	5.16	5.16

CUMULATIVE AREA = 6.41 SQ MI

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RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

TIME OF			PEAK	TIME OF	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN	MAXIMUM	
STAGE	OPERATION	STATION	FLOW	PEAK	6-HOUR	24-HOUR	72-HOUR	AREA	STAGE	MAX
+	HYDROGRAPH AT	A1	64.	2.37	12.	7.	7.	.08		
+	HYDROGRAPH AT	A7	44.	2.27	6.	4.	4.	.03		
+	HYDROGRAPH AT	01	153.	2.53	35.	21.	21.	.23		
+	3 COMBINED AT	CP-01	229.	2.47	53.	32.	32.	.34		
+	ROUTED TO	CP-A15	227.	2.83	54.	33.	33.	.34		
+	HYDROGRAPH AT	A5	66.	2.27	10.	6.	6.	.06		
+	ROUTED TO	CP-A10	65.	2.30	10.	6.	6.	.06		
+	HYDROGRAPH AT	A10	117.	2.23	16.	10.	10.	.08		
+	2 COMBINED AT	CP-A10	170.	2.27	26.	16.	16.	.14		
+	ROUTED TO	CP-A15	170.	2.30	26.	16.	16.	.14		
+	HYDROGRAPH AT	A15	124.	2.30	19.	11.	11.	.10		
+	3 COMBINED AT	CP-A15	307.	2.83	98.	60.	60.	.58		
+	ROUTED TO	CP-A20	306.	3.00	99.	60.	60.	.58		
+	HYDROGRAPH AT	05	82.	2.30	14.	8.	8.	.10		
+	ROUTED TO	CP-A20	81.	2.57	14.	9.	9.	.10		
+	HYDROGRAPH AT	A20	232.	2.40	44.	27.	27.	.25		
+	HYDROGRAPH AT	A25	32.	2.27	5.	3.	3.	.03		
+	HYDROGRAPH AT	A27	34.	2.23	4.	3.	3.	.02		
+	5 COMBINED AT	CP-A20	569.	2.50	165.	101.	101.	.98		
+	ROUTED TO	CP-A25	567.	2.53	165.	101.	101.	.98		
+	HYDROGRAPH AT	A23	79.	2.23	11.	6.	6.	.05		
+	ROUTED TO	CP-A25	78.	2.27	11.	6.	6.	.05		
+	2 COMBINED AT	CP-A25	599.	2.53	176.	107.	107.	1.03		
+	ROUTED TO	CP-A30	598.	2.53	176.	107.	107.	1.03		
+	HYDROGRAPH AT	O25	77.	2.50	17.	10.	10.	.13		
	HYDROGRAPH AT									

+		O20	147.	2.57	36.	22.	22.	.26
+	ROUTED TO	CP-O30	146.	2.67	36.	22.	22.	.26
+	HYDROGRAPH AT	O30	65.	2.53	15.	9.	9.	.13
+	3 COMBINED AT	CP-O30	276.	2.60	68.	41.	41.	.53
+	ROUTED TO	CP-O45	275.	2.60	68.	41.	41.	.53
+	HYDROGRAPH AT	045	95.	2.33	16.	9.	9.	.08
+	2 COMBINED AT	CP-045	329.	2.57	84.	51.	51.	.61
+	ROUTED TO	CP-050	328.	2.60	84.	51.	51.	.61
+	HYDROGRAPH AT	057	575.	2.37	102.	62.	62.	.53
+	ROUTED TO	CP-050	570.	2.47	102.	62.	62.	.53
+	HYDROGRAPH AT	050	493.	2.40	90.	54.	54.	.46
+	3 COMBINED AT	CP-050	1301.	2.47	275.	166.	166.	1.60
+	ROUTED TO	CP-010	1299.	2.50	275.	166.	166.	1.60
+	HYDROGRAPH AT	010	68.	2.30	11.	7.	7.	.08
+	2 COMBINED AT	CP-010	1346.	2.50	286.	173.	173.	1.68
+	ROUTED TO	CP-036	1345.	2.50	287.	173.	173.	1.68
+	HYDROGRAPH AT	036	166.	2.27	24.	15.	15.	.12
+	HYDROGRAPH AT	060	95.	2.30	17.	10.	10.	.15
+	ROUTED TO	CP-036	94.	2.30	17.	10.	10.	.15
+	3 COMBINED AT	CP-036	1508.	2.50	327.	198.	198.	1.94
+	ROUTED TO	CP-A30	1507.	2.50	327.	198.	198.	1.94
+	HYDROGRAPH AT	A30	78.	2.27	12.	7.	7.	.07
+	3 COMBINED AT	CP-A30	2150.	2.50	514.	312.	312.	3.04
+	ROUTED TO	CP-A31	2145.	2.50	514.	312.	312.	3.04
+	HYDROGRAPH AT	A28	34.	2.23	4.	3.	3.	.02
+	ROUTED TO	CP-A31	33.	2.27	4.	3.	3.	.02
+	HYDROGRAPH AT	A31	71.	2.27	10.	6.	6.	.05
+	3 COMBINED AT	CP-A31	2196.	2.50	528.	321.	321.	3.11
+	ROUTED TO	CP-S1A	2184.	2.57	527.	320.	320.	3.11
+	HYDROGRAPH AT	B10	9.	2.20	1.	1.	1.	.01
+	HYDROGRAPH AT	B20	7.	2.20	1.	1.	1.	.01
+	2 COMBINED AT	C12	16.	2.20	2.	1.	1.	.01
+	HYDROGRAPH AT	C2	5.	2.33	1.	1.	1.	.01
+	HYDROGRAPH AT	B30	6.	2.20	1.	0.	0.	.01

+	2 COMBINED AT	C23	9.	2.27	2.	1.	1.	.01
+	ROUTED TO	C3	9.	2.40	2.	1.	1.	.01
+	HYDROGRAPH AT	B40	127.	2.20	17.	10.	10.	.09
+	HYDROGRAPH AT	SD43	64.	2.47	16.	10.	10.	.09
+	HYDROGRAPH AT	B50	104.	2.20	14.	8.	8.	.08
+	2 COMBINED AT	C45	139.	2.20	29.	18.	18.	.17
+	HYDROGRAPH AT	CP4	163.	2.23	35.	22.	22.	.20
+	2 COMBINED AT	CCP4	283.	2.20	52.	32.	32.	.30
+	HYDROGRAPH AT	CP3	302.	2.23	58.	36.	36.	.34
+	2 COMBINED AT	CCP3	304.	2.23	60.	37.	37.	.35
+	HYDROGRAPH AT	MX1	42.	2.20	6.	3.	3.	.03
+	HYDROGRAPH AT	MX2	95.	2.20	13.	8.	8.	.08
+	2 COMBINED AT	MX12	137.	2.20	18.	11.	11.	.11
+	ROUTED TO	MX123	136.	2.20	18.	11.	11.	.11
+	HYDROGRAPH AT	MX3	22.	2.20	3.	2.	2.	.02
+	2 COMBINED AT	CP3A	158.	2.20	21.	13.	13.	.13
+	ROUTED TO	RCP3	155.	2.20	21.	13.	13.	.13
+	2 COMBINED AT	CCP3	455.	2.23	81.	50.	50.	.48
+	ROUTED TO	RCP2	454.	2.23	81.	50.	50.	.48
+	HYDROGRAPH AT	RP2	26.	2.50	6.	4.	4.	.05
+	2 COMBINED AT	CCP2	468.	2.23	87.	54.	54.	.53
+	HYDROGRAPH AT	SVRW	40.	2.47	9.	5.	5.	.06
+	HYDROGRAPH AT	EB	7.	2.37	1.	1.	1.	.01
+	HYDROGRAPH AT	WB	10.	2.47	2.	1.	1.	.02
+	HYDROGRAPH AT	WSVR	7.	2.40	1.	1.	1.	.01
+	5 COMBINED AT	CP1	503.	2.23	100.	62.	62.	.63
+	HYDROGRAPH AT	S1	679.	2.33	113.	68.	68.	.52
+	3 COMBINED AT	CP-S1	1116.	2.33	216.	132.	132.	1.16
+	2 COMBINED AT	CP-S1A	2955.	2.53	736.	452.	452.	4.26
+	ROUTED TO	CP-S10	2950.	2.53	736.	452.	452.	4.26
+	HYDROGRAPH AT	A60	45.	2.23	6.	4.	4.	.03
+	ROUTED TO	CP-A50	44.	2.30	6.	4.	4.	.03
+	HYDROGRAPH AT	055	463.	2.33	79.	48.	48.	.48
+	ROUTED TO	CP-A50	462.	2.37	79.	48.	48.	.48

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+	HYDROGRAPH AT	A50	287.	2.33	46.	28.	28.	.25
+	3 COMBINED AT	CP-A50	771.	2.33	131.	79.	79.	.76
+	DIVERSION TO	A50	156.	2.33	4.	2.	2.	.76
+	HYDROGRAPH AT	A50	615.	2.33	127.	77.	77.	.76
+	HYDROGRAPH AT	A42	46.	2.23	6.	4.	4.	.03
+	2 COMBINED AT	CP-A50	658.	2.27	133.	80.	80.	.80
+	ROUTED TO	CP-A45	653.	2.40	133.	80.	80.	.80
+	HYDROGRAPH AT	A40	45.	2.23	6.	4.	4.	.03
+	ROUTED TO	CP-A45	44.	2.43	6.	4.	4.	.03
+	HYDROGRAPH AT	A35	92.	2.27	13.	8.	8.	.06
+	ROUTED TO	CP-A45	90.	2.43	13.	8.	8.	.06
+	HYDROGRAPH AT	A45	154.	2.30	24.	14.	14.	.12
+	4 COMBINED AT	CP-A45	915.	2.40	176.	106.	106.	1.02
+	DIVERSION TO	A45	855.	2.37	126.	76.	76.	1.02
+	HYDROGRAPH AT	A45	60.	2.37	50.	31.	31.	1.02
+	ROUTED TO	CP-S10	60.	2.60	50.	30.	30.	1.02
+	HYDROGRAPH AT	S10	273.	2.47	54.	32.	32.	.26
+	3 COMBINED AT	CP-S10	3270.	2.53	839.	515.	515.	5.54
+	ROUTED TO	CP-B30	3217.	2.60	838.	514.	514.	5.54
+	HYDROGRAPH AT	A65	76.	2.23	10.	6.	6.	.05
+	ROUTED TO	CP-S25	74.	2.53	10.	6.	6.	.05
+	HYDROGRAPH AT	S25	38.	2.47	8.	5.	5.	.08
+	2 COMBINED AT	CP-S25	111.	2.53	19.	11.	11.	.14
+	ROUTED TO	CP-S20	108.	2.57	19.	11.	11.	.14
+	HYDROGRAPH AT	S20	66.	2.43	14.	8.	8.	.14
+	2 COMBINED AT	CP-S20	166.	2.57	33.	20.	20.	.27
+	ROUTED TO	CP-B30	162.	2.73	32.	20.	20.	.27
+	HYDROGRAPH AT	S15	167.	2.27	24.	15.	15.	.13
+	ROUTED TO	CP-B30	163.	2.37	24.	15.	15.	.13
+	HYDROGRAPH AT	B20	54.	2.23	7.	4.	4.	.04
+	ROUTED TO	CP-B25	52.	2.30	7.	4.	4.	.04
+	HYDROGRAPH AT	B25	162.	2.27	23.	14.	14.	.13
+	2 COMBINED AT	CP-B25	212.	2.27	30.	18.	18.	.17
	ROUTED TO							

		Mk Alan	4.53	6	24	72	Area
+	CP-B25	209.	2.43	30.	18.	18.	.17
+ HYDROGRAPH AT	B15	108.	2.27	15.	9.	9.	.07
+ ROUTED TO	CP-B30	107.	2.30	15.	9.	9.	.07
+ HYDROGRAPH AT	B30	90.	2.80	28.	17.	17.	.23
+ 6 COMBINED AT	CP-B30	3673.	2.60	967.	593.	593.	6.41
+ ROUTED TO	DB-030	859.	4.53	658.	441.	441.	6.41

+
+
4.53
1

7.57

SUMMARY OF KINEMATIC WAVE - MUSKINGUM-CUNGE ROUTING

6.78 mi 2