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91st Avenue Drain Hydrology Update
Flood Control District of Maricopa County
Watershed Management Branch

October 3, 1994

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Project:	91st Avenue Drain Hydrology Update
Date:	Draft #1: June 1994 Draft #2: October 3, 1994 Final
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File:	

Comments:

This report explains the development of the model for the 91st Avenue watershed north of Greenway Road. It includes the Westbrook Village development, both east and west of 91st Avenue; and other subdivision projects from Greenway Road to Calle Lejos north of Happy Valley Road.

With the cooperation of the City of Peoria, a hydrologic model has been developed to reflect the existing condition hydrology for this watershed. The model is developed for use by the District staff to monitor overall changes and trends in the watershed, and is not intended for any design. use.

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91ST AVENUE DRAIN HYDROLOGY UPDATE

1. INTRODUCTION

Watershed Management Branch of the Flood Control District of Maricopa County (District) is tasked with maintaining the hydrologic integrity of its structures. As development occurs upstream of these structures, the design hydrology is updated to reflect these changes.

City of Peoria is experiencing rapid growth in the watershed north of the existing 91st Avenue drainage channel along Greenway Road. The channel was designed and constructed by the Flood Control District to convey a 2-year peak discharge of about 750 cfs (21 m^3/s) into the New River. As new developments occur, drainage pattern in the watershed is altered. The Glendale-Peoria Area Drainage Master Plan developed in 1987 has been used to manage the development in this watershed until recently. However, many of the features proposed by the ADMP such as the Interceptor channels along Pinnacle Peak Road have not been implemented. With new subdivision development projects in the area, there is a need for a comprehensive hydrologic model to provide peak discharge estimates by considering existing and proposed drainage master plans in the area.

With the cooperation of the city, a hydrologic model has been developed to reflect the existing condition hydrology for this watershed. The model is developed for use by the District staff to monitor overall changes and trends in the watershed, and is not intended for use in any design.

This report explains the development of the model for the 91st Avenue watershed north of Greenway Road. It includes the Westbrook Village development, both east and west of 91st Avenue; and other subdivision projects from Greenway Road to Calle Lejos north of Happy Valley Road.

2. REVIEW OF PREVIOUS HYDROLOGIC MODELS

Several hydrologic models have covered all or parts of this watershed. Following is a partial list of the models that have been considered or utilized in the development of the updated model.

Westbrook Village Master Drainage Report prepared by UDC for the City of Peoria. September 1983.

An SCS hydrologic method was used to estimate peak discharges for the watershed north of Beardsley Road with an area of 2.49 sq. miles (6.45 km^2). It was shown in the report that the volume of available storage in golf courses is 472.3 ac-ft. The estimated onsite retention requirement is only 31.23 ac-ft. Appendix A shows results of hydrologic calculations for the developed condition.

Bell Road Project Drainage Study, Volume IV, Selected Stormwater/Floodwater Management Plans . Prepared by Greiner Engineering Sciences, Inc. for the Flood Control District of Maricopa County, October 1987.

HEC-1 model was used to estimate peak runoff of 2, 5, 10, 50 and 100 years return period from a watershed of 51.4 sq. miles (133 km^2) north of Bell Road, extending from Grand Avenue to Scottsdale Road. Drainage Area 2 includes the 91st Avenue watershed north of Bell Road. As per requirement of the City of Peoria, the proposed drains to New River were designed for 2-yr peak flows as follows:

(1) along Union Hills from 87th Avenue to New River, 42" conduit to carry 32 cfs (0.9 m^3/s),
(2) along Bell Road from 87th Avenue to New River, 42" then 54" to carry 48 cfs (1.36 m^3/s).

Open channels are proposed along 91st Avenue from Deer Valley Road to Greenway Road and along 87th Avenue from Deer Valley Road to Union Hills Road. Appendix B shows selected drainage plan .

Master Plan of Storm Drainage , City of Peoria, prepared by James Montgomery Consulting Engineers, Inc., April 1988.

Peak discharge with 2, 10, 25 and 100 years return period were determined. The US Army Corps of Engineers HEC-1 model was used for area north of Pinnacle Peak Road. SWMM, a hydrologic computer program developed for the Environmental Protection Agency, was used for the areas in the south.

91st Avenue Channel Improvement Alignment Study by Dibble and Associates. March 1989

SWMM was used to model the area between Pinnacle Peak Road and Greenway Road covering 4.65 sq. miles (11.8 km^2). At the intersection of Greenway Road and 91st Avenue(extended), the 2-year 2-hour design peak flow is about 750 cfs (21 m^3/s). Appendix C shows the hydrologic network for the SWMM model.

Final Drainage Report for Bell Park, Development Engineering, Inc., Feb. 1992

The report discussesd the on-site and off-site drainage for 142 acre subdivision project west of Union Hills Drive and east of 87th Avenue. Appendix D shows the off-site flow schematic for this project.

Master Grading and Drainage Plan, Westbrook Village, Section 27, City of Peoria, prepared by Carter Associates in 1989 and revised by IMC Consultants, Ltd, April 1993

A study of pre-development and post-development hydrologic condition was made using HEC-1. Two drainage channels have been constructed to collect offsite runoff. Within the development, 10 detention basins with a total available retention volume of 112 ac-ft are constructed. SCS curve numbers were used for the rainfall loss parameters. Appendix E shows location of retention basins and contributory parcels with proposed flow directions within the subdivisions.

Arrowhead Cove & Arrowhead Business Park, Preliminary Drainage Report by Erie & Associates, Inc. July 1993

A proposed development west of 91st Avenue south of Bell Road. For offsite hydrology, ERIE & Associates formulated a HEC-1 model for a watershed area of 10.04 sq. miles (25.4 km^2) north of Greenway Road.

The model assumes that a retention basin is located near intersection of 91st Avenue and Union Hills Road with a depth of 8 ft (2.4 m) and storage of 50 ac-ft. The drainage master plans of Westbrook Village were not considered in this study. Appendix F shows a project location map and watershed boundaries.

Fletcher Heights Preliminary Drainage Plan, Concept Overview prepared for New Citrus Farms, Ltd. by CMX Group,Inc. June 7, 1993.

The report provides preliminary estimates of offsite runoff for a proposed master planned community of 793 acres (320 ha) in Peoria east of 83rd Avenue including two-thirds of the existing citrus farm north of Westbrook Village East. Offsite watershed was subdivided into 3 sub-areas. Sub-area 1 runoff will be ultimately discharged through a box culvert under Beardsley Road into the Westbrook Village East.

Depending on how the offsite and onsite runoff is handled, this project will affect the peak runoff on Union Hills Road, Bell Road and ultimately at the existing 91st drainage channel along Greenway Road. Appendix G shows proposed project location and watershed boundaries.

Drainage Report for Calbrisa. Prepared for Continental Homes by Coe & Van Loo Consultants, Inc. July 21, 1993.

The report provides drainage analyses for the proposed development of Calbrisa, located north of Greenway Road alignment with 91st Avenue alignment. Since the existing 91st Avenue drain is not designed to convey a 100-year flow, City of Peoria has required for a HEC-2 run to determine how the subdivision will be impacted by overflow of the existing channel.

Finished floor elevations of the Calbrisa subdivision have been designed to be above the 100-year high water elevation. The 10-year flows will be conveyed within street sections below the top of street curbs. Appendix H shows the location of the Calbrisa subdivision project.

Preliminary Drainage Report, Prepared for Montana Del Sol by American Engineering Company. December 14, 1993.

The report includes proposed onsite retention for 25 lots covering 17 acres (7 ha) at the southeast corner of 83rd Avenue and Calle Lejos. In addition, the offsite runoff was also estimated. It was noted that a drainage swale on the north side of Calle Lejos can carry about 137 cfs (3.9 m^3/s) towards 83rd Avenue and the excess will flow southward.

3. WATERSHED CHARACTERISTICS

The 91st Avenue watershed is located north of Greenway Road, approximately 83rd Avenue to 99th Avenue. Elevation ranges from 1800 ft (550 m) on the northern most tip and about 1177 ft (360 m) along Greenway Road in its southern boundary. General slope is 1.8 percent for a watershed length of 6.5 miles (10.5 km) extending in an approximately north-south direction . The drainage pattern of the northern half is mostly of undefined shallow washes with sparse desert vegetation . The southern portion is urbanizing rapidly with several proposed land development projects. The area of the contributing watershed is 9.58 sq. miles (25 km^2).

A 2-foot topographic map has been prepared for the District as part of the Arizona Canal Diversion Channel Area Drainage Master Study (ACDC ADMS) by Kenny Aerial Mapping, Inc. The topographic map has a scale of 1" = 400' using aerial photographs dated April of 1991. The sub-basins delineated are shown in Figure 1.

The length of water course and slope of each sub-basin have been determined using the 2-foot contour map. Sub-basin areas are determined using a planimeter.

4. METHODOLOGY

Criteria set forth by the Drainage Design Manual for Maricopa County, Volume I, Hydrology, is used to generate the peak runoff and volumes.

Model development was started in August 1993 in constant consultation with the City of Peoria. Earlier assumptions have been revised as a result of discussions specially on split flows at road intersections.

5. RAINFALL

The rainfall used in the model is the 100-year 6-hour storm. Rainfall depths corresponding to different return frequencies can be found in Table 1.

Table 1

6 hour precipitation depths (inches)*						
Frequency	2-year	5-year	10-year	25-year	50-year	100-year
Rainfall	1.2	1.7	2.05	2.55	2.82	3.20

*NOAA Atlas No. 2 - Vol VIII.

The Flood Control District's MCUHP1 (Maricopa County Unit Hydrograph Procedure 1) program automatically determines the temporal distribution of the rainfall. A multi-ratio plan run for the "dry condition" is performed to determine expected peak discharge of return periods 2, 5, 10, 25, 50 and 100 years.

6. LOSS PARAMETERS

Green and Ampt loss parameters have been derived using available SCS soil maps of the area. For each sub-basin, the 5 most dominant soil mapping units comprising the total area have been determined by assigning approximate percentage of total area to each soil mapping unit. The weighted value of the saturated hydraulic conductivity (XKSAT) is used for estimation of other loss rate parameters, i.e. PSIF and DTHETA values. Based on the soil map, it was found that the area north of Beardsley Road have clay to clay loam soils with low XKSAT values and hence greater runoff will be expected. Figure 2 shows the soil map of the area.

The land use factors have been roughly estimated using available aerial photographs including possible percentage vegetative cover. Values of XKSAT have been adjusted for vegetation cover according to Figure 4.4 in MCFCD Drainage Design Manual (1991)

Table 2 shows summary of rainfall loss parameters.

7. UNIT HYDROGRAPH

Parameters for the Clark Unit Hydrograph are determined using MCUHP1 program (see Table 2, last 2 columns). In the Westbrook Village East, SCS's unit dimensionless method was used for the design of the retention ponds. For this area, the largest value for the Lag time is divided by 0.60 to get a rough estimate of the time of concentration which is required in the UC record of the updated model. This was based on empirical relationship "TLAG = 0.60 * TC" as given in USACOE HEC-1 User's Manual (1990)

8. FLOW ROUTING

The major routing reaches consists of the 91st Avenue, 89th Avenue, an undefined channel crossing the undeveloped area between Beardsley Road and Deer Valley Road, two channels that have been constructed in Westbrook Village East, a proposed channel along the east boundary of Sun City and the existing 91st Avenue drain. There are no well defined natural channels. Possible flow directions are estimated from the available 2-ft contour topographic map.

Normal depth routing procedure is used to route flow through streets and assumed hypothetical channel cross-sections which are difficult to determine from the topo map. In routing through Westbrook Village East, cross sections shown in the Mass Grading and Drainage Plan prepared by Carter Associates, Inc. are used to determine the RC, RX and RY records of the HEC-1 model.

Table 2 - Rainfall Loss Rate and Unit Hydrograph Parameters

Sub-Basin	DA	IA	DTHETA	PSIF	XKSAT	RTIMP	TC	STOR.K
SB-A1	.117	.35	.25	4.2	.43	3	.483	.441
SB-A2	.205	.35	.25	4.1	.44	5	1.125	.835
SB-A3	.175	.35	.25	4.1	.44	2	.954	.820
SB-A4	.145	.35	.25	3.9	.38	2	.742	.480
SB-A5	.088	.35	.25	3.9	.37	2	1.008	1.289
SB-A6	.086	.35	.25	3.9	.37	2	.546	.562
SB-A7	.083	.35	.25	3.5	.29	2	.688	.679
SB-B1	.087	.35	.25	3.8	.29	1.00	.254	.225
SB-B2	.160	.35	.25	3.8	.29	3	.317	.296
SB-B3	.119	.35	.25	3.9	.38	10	1.096	.934
SB-B4	.32	.35	.25	3.9	.38	2	1.375	1.009
SB-B5	.114	.35	.25	4.1	.46	2	1.008	1.045
SB-B6	0.156	.35	.25	3.9	.40	2	.692	.407
SB-B7	.67	.35	.25	3.8	.35	2	.144	.695
WBW	1.00	.35	.25	3.5	.28	30	1.00	.85
SB-C1	.100	.25	.25	4.1	.42	5	.513	.406
SB-C2	.190	.25	.25	3.5	.29	10	.400	.238
C3	0.04	.25	.25	3.5	.29	20	.338	.399
SB-C4	.070	.15	.25	3.5	.29	15	.492	.546
SB-C5	.120	.25	.25	3.5	.29	30	.563	.654
WB-P8B	.0085	.25	.25	3.5	.28	30	.17	.15
WB9	.2814	.25	.25	3.5	.28	45	.290	.250
SB-D1	.13	.35	.25	4.3	.46	2	.346	.232
SB-D2	.073	.35	.25	4.3	.46	2	.692	.874
SB-D3	.114	.35	.25	3.5	.29	10	.571	.393
SB-D4	.12	.35	.25	3.5	.29	15	.583	.391
SB-D5	.188	.35	.15	8.5	.06	15	.50	.40
SB-D6	.145	.35	.15	9.4	.02	2	.500	.400
SB-D7	.150	.25	.25	4.1	.42	5	.296	.227
SB-D93	.15	.25	.25	3.50	0.29	15.0	0.379	0.260
SB-D9	.310	.25	.25	3.5	.29	15	.546	.426
SB-D10	.080	.15	.25	3.5	.25	15	.433	.474
SB-D11	.080	.15	.25	3.5	.25	15	.467	.451
SB-D12	.180	.20	.25	3.5	.30	2	.917	1.033
WB1	0.123	.35	.25	8.4	.06	35	0.333	.250
WB2	0.101	.35	.15	8.4	.06	45	0.680	.500
WB3	.0126	.35	.25	3.5	.29	45	.177	.150
SB-F1	.114	.35	.25	4.0	.40	0	.383	.342
SB-F2	.102	.35	.25	3.5	.29	2	.663	.518
SB-F3	.181	.35	.10	12.4	.01	10	.779	.595
SB-F4	.136	.35	.15	8.4	.06	20	.500	.400
SB-F5	.059	.35	.30	6.6	.17	5	.500	.518
SB-E1	.097	.35	.25	4.2	.43	2	.463	.416
SB-E2	.153	.35	.25	3.5	.29	2	.733	.515
SB-E3	.143	.35	.30	6.6	.17	15	.563	.340
SB-E4	.100	.35	.15	12.4	.01	15	.500	.400
SB-E5	.107	.35	.15	10.0	.03	2	.500	.400
SB-F6	.032	.35	.10	12.4	.01	10	.400	.300
SB-F7	.360	.35	.15	8.0	.04	5	.500	.400
WB4	.0644	.35	.25	3.5	.29	45	0.241	.200
WB5	.079	.35	.25	3.5	.29	45	.285	.250
WB7	.033	.35	.15	8.4	.06	60	.218	.150
WB6	.0839	.35	.15	8.4	.06	45	0.433	.300
WB8	.0342	.35	.15	8.4	.06	60	0.167	.150
WB10	.0572	.35	.25	5.0	.28	45	.272	.200
SB-G6	.032	.20	.30	6.80	.16	5.00	.379	.315
SB-G1	.034	.20	.15	8.4	.06	40	.229	.153
SB-G2	.064	.20	.15	8.4	.06	30	.392	.307
SB-G3	.260	.20	.25	3.80	.26	35	.708	.618
SB-G4	.234	.20	.25	5.5	.19	15	.721	.589
SB-G5	.196	.20	.30	6.8	.16	15	.625	.497
SB-H2	.064	.20	.25	6.3	.19	5	.504	.382
SB-H1	.06	.20	.25	6.3	.19	10.0	.387	.296
SB-H3	.086	.20	.25	6.3	.19	5	.475	.321
SB-H4	.069	.20	.15	8.6	.06	5.0	.408	.349
SB-H5	.070	.20	.25	5.80	.23	5.0	.421	.358
SB-H6	.230	.20	.25	5.80	.23	15.0	.625	.342

Table 3 - Channel Routing Parameters

SUB-B	NLEFT	NCH	NRIGHT	RLEN	SLOPE	CHANNEL SECTION								
R-A1	.04	.03	.04	2800	.0064	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-A2	.04	.03	.04	3600	.0072	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-A3	.04	.03	.04	2800	.0064	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-A4	.04	.03	.04	3800	.0058	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-A5	.04	.03	.04	2600	.0058	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-B1	.03	.02	.03	2640	.0102	X:	0	10	20	30	40	50	60	70
						Y:	102	101	100	100	100	100	101	102
R-B2	.03	.02	.03	1760	.0250	X:	0	10	20	30	40	50	60	70
						Y:	102	101	100	100	100	100	101	102
R-B3	.03	.02	.03	5280	.0066	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-B4	.04	.03	.04	5280	.0059	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-B5	.04	.03	.04	2640	.0064	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-B6	.04	.03	.04	5250	.0059	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
RWBW1	.03	.02	.03	5280	.0050	X:	0	30	60	90	190	300	330	360
						Y:	104	103	101	100	100	101	103	104
RRBOF	.03	.02	.03	2080	.0063	X:	0	20	40	60	80	100	120	140
						Y:	102	101	100	100	100	100	101	102
R-C1	0.03	0.02	.03	3280	.0091	X:	0	2	12	22	42	52	62	64
						Y:	102	100	100	100	100	100	100	102
R-C2	0.025	.02	.025	2640	.0068	X:	0	2	12	22	42	52	62	64
						Y:	102	100	100	100	100	100	100	102
R-C3	.025	.02	.025	2640	.0068	X:	0	2	12	22	42	52	62	64
						Y:	102	100	100	100	100	100	100	102
R-C4	.025	.02	.025	5280	.0061	X:	0	2	12	22	42	52	62	64
						Y:	102	100	100	100	100	100	100	102
R-CB	0.02	.015	.02	2381	.0045	X:	0	12	22	40	80	121	131	143
						Y:	103	100	100	102	102	100	100	103
R-D1	.03	.02	.03	2640	.0223	X:	0	20	40	60	80	100	120	140
						Y:	103	102	101	100	100	101	102	103
R-D2	.04	.03	.04	2640	.0109	X:	0	5	10	20	40	50	55	60
						Y:	102	101	100	100	100	100	101	102
R-D3	.03	.02	.03	2640	.0076	X:	0	5	10	20	40	50	55	60
						Y:	102	101	100	100	100	100	101	102
R-D4	.03	.02	.03	1400	.001	X:	0	5	10	20	40	50	55	60
						Y:	103	102	101	100	100	101	102	103
R-D5	.03	.02	.03	2640	.0048	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-D6	.03	.02	.03	2640	.0045	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-D7	.03	.02	.03	2640	.0083	X:	0	3	6	16	26	37	47	50
						Y:	103	100	100	100	100	100	100	103
RD03	.03	.02	.03	2640	.0083	X:	0	3	6	16	26	37	47	50
						Y:	103	100	100	100	100	100	100	103
R-D10	.025	.02	.025	2640	.0061	X:	0	3	6	16	27	37	47	50
						Y:	103	100	100	100	100	100	100	103
R-D11	.04	.03	.04	5600	.0054	X:	0	20	50	80	120	150	180	200
						Y:	102	101	100	100	100	100	101	102
R-WBE1	.03	.02	.03	260	.00192	X:	0	12	17.5	22.5	33.5	37.5	43	55
						Y:	45	42	40	40	40	40	42	45
RD10F	.03	.02	.03	2640	.008	X:	0	5	10	20	40	50	55	60
						Y:	102	101	100	100	100	100	101	102
R-F2	.03	.02	.03	2640	.0061	X:	0	5	10	20	40	50	55	60
						Y:	102	101	100	100	100	100	101	102
R-F3	.03	.02	.03	2640	.0053	X:	0	5	10	20	40	50	55	60
						Y:	102	101	100	100	100	100	101	102
R-F4	.03	.02	.03	2640	.00492	X:	0	5	10	20	40	50	55	60
						Y:	103	102	100	100	100	100	102	103
RED	.04	.03	.04	2800	.00857	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-E2	.04	.03	.04	2640	.0068	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-E3	.03	.02	.03	2640	.0052	X:	0	5	10	20	40	50	55	60
						Y:	102	101	100	100	100	100	101	102
R-E4	.04	.03	.04	2640	.0049	X:	0	25	50	80	120	150	175	200
						Y:	102	101	100	100	100	100	101	102
R-E5	.04	.03	.04	2640	.0057	X:	0	25	50	50	80	120	175	200
						Y:	102	101	100	100	100	100	101	102
R-F5	.04	.03	.04	2640	.00492	X:	0	20	40	60	80	100	120	140
						Y:	103	102	101	100	100	101	102	103
R-F6	.03	.02	.03	1720	.00197	X:	0	20	40	60	80	100	120	140
						Y:	103	102	101	100	100	101	102	103
RCR26	.04	.03	.04	1420	.0018	X:	0	30	60	90	120	150	180	210
						Y:	104	102	100	100	100	100	102	104
RC78	.03	.02	.03	1120	.0032	X:	0	15	30	60	80	105	120	135
						Y:	104	102	100	100	100	100	102	104
RRL87	.02	0.015	.02	660	.0015	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	101	101	100	102	104
RRCR4	0.015	0.015	0.015	1320	.0037	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	101	101	100	102	104
RRD41	.02	.015	.02	1320	.0015	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	101	101	100	102	104
RDV91	.02	.015	.02	1280	.0018	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	101	101	100	102	104
R93RD	.02	.015	.02	360	.0037	X:	0	5	10	20	40	50	55	60
						Y:	105	103	100	100	100	100	103	105

R33G6	.03	.02	.03	640.0	.0001	X:	0	10	20	30	40	50	60	70
						Y:	104	102	101	100	100	101	102	104
RDV91	.02	.015	.02	360	.0133	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	102	102	100	102	104
RCG691	.03	.02	.03	2320	.0091	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	102	102	100	102	104
RDV87S	.02	0.015	.02	1160	.0051	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	101	101	100	102	104
R-G1	.02	.015	0.02	4400	.0039	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	101	101	100	102	104
RDBG2	7.02	0.015	.02	1320	.0015	X:	0	1	5	45	50	90	94	95
						Y:	104	102	100	101	101	100	102	104
RDV89	.02	.015	.02	5280	.0049	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	101	101	100	102	104
RBG3	.02	.015	.02	680	.0015	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	101	101	100	102	104
RWG4	.02	.015	.02	680	.0047	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	101	101	100	102	104
RDG5	.03	.02	.03	1250	.0042	X:	0	6	12	24	36	48	60	72
						Y:	108	104	102	100	100	102	104	108
RDG4	.02	.015	.02	440	.0050	X:	0	1	5	35	40	70	75	75
						Y:	103	102	100	99	99	100	102	104
R-H2	.02	.015	.02	880	.0037	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	99	99	100	102	104
RRDG2	.02	.015	.02	1000	.0017	X:	0	10	20	30	40	60	60	70
						Y:	108	104	102	100	100	102	104	108
RDWPL	.02	.015	.02	720	.0038	X:	0	1	5	35	40	70	74	75
						Y:	104	102	100	101	101	100	102	104
R-H3	.03	.02	.03	560	.0036	X:	0	10	20	35	45	60	70	80
						Y:	108	104	102	100	100	102	104	108
RDH4	.02	.015	.02	1250	.0042	X:	0	6	12	24	36	48	60	72
						Y:	108	104	102	100	100	102	104	108
RPMG	0.02	.015	.02	1720	.0008	X:	0	7	14	20	28	34	41	48
						Y:	107	103.5	100	100	100	100	103.5	107
DVPL	.02	.015	.02	1560	.0090	X:	0	5	20	30	40	50	55	60
						Y:	103	102	101	101	101	101	102	103

RETENTION BASINS DATA

SV	0	50	100	150	200	300	350	400	500	
SE	26	27	28	29	30	32	34	36	38	
SV	0	.35	2.28	6.4	12.82	24.0				
SE	27.5	28.5	29.5	30.5	31.5	32.5				
SV	0	.19	1.23	3.71	7.37	12.1	24.0			
SE	32	33	34	35	36	37	38.0			
SV	0	2.57	7.19	13.71	22.4	32	37	42	47	52
SE	27	28	29	30	31	33	34	35	36	37
SV	0	2	4	6	8					
SE	33	34	35	36	37					
SV	0	.1138	.6342	1.4316	3.3	5.5	6.46	6.94	7.5	10.5
SE	36	37	38	39	40	41	42	43	44	45.5
SV	0	1.97	4.86	9.02	14.99	20	25	30	34	38
SE	26	27	28	29	30	31	32	33	34	35
SV	0	.15	.85	2.26	4.71	6.0	7.0	9.0		
SE	27	28	29	30	31	32	33	34		
SV	0	.36	2.13	5.54	10.63	15.29	16.0			
SE	27	28	29	30	31	32	33			
SV	0	.03	.376	1.698	4.517	9.114	12.000			
SE	25	26	27	28	29	30	31			

DIVERSIONS DATA

KK	D-B4				
DT	DB4				
DI	1	10	100	1000	10000
DQ	.5	5	50	500	5000
KK	D-D2				
DT	DC2				
DI	9	90	900	9000	
DQ	3	9	90	900	
KK	DB4				
DR	DB4				
KK	D-D5				
DT	DC5				
DI	0	50	100	200	300	400
DQ	0	15	30	60	90	120
KK	DVD2					
DT	DD2					
DI	0	50	100	137	200	400
DQ	0	50	100	137	137	137
KK	D93E					
DT	D93E					
DI	0	100	1000			
DQ	0	30	300			
KK	DC2					
DR	DC2					
KK	RD93E					
DR	D93E					
KK	DC5					
DR	DC5					
KK	RD2					

For hypothetical routing reaches, the assumed cross section has the following RC, RX and RY records:

RC	.04	.03	.04	Length	slope			
RX	0	25	50	80	120	150	175	200
RY	102	101	100	100	100	100	101	102

Available cross-sections of 91st Avenue, Union Hill Road, Beardsley Road and Westbrook Village East channels are used in the routing. All of the flow in the Westbrook Village East is routed through 10 detention basins as given in the drainage plan for the area. The storage characteristics are those given in the model formulated by Carter Associates, Inc. report as revised by IMC Consultants Ltd. Drainage area contributing to each basin is as shown in the layout. Approximate length of each routing reach is measured from the drainage plan.

Flow diversion southward of intersection of 87th Avenue and Paradise Lane is routed directly to the existing drainage along Greenway Road alignment.

Table 3 shows summary of routing parameters.

9. SPLIT FLOW CONSIDERATIONS

The watershed has very few well defined drainage channels. Thus, in general, the runoff is basically sheet flow. At road intersections split flows occur and certain percentage distribution has been assumed. For some of the intersections south of Union Hills Road, data on flow rating have been provided by Erie and Associates for split flows as shown in Appendix H. While these are rough estimates they have been incorporated into the model as there are no other data available.

As per drainage master plan of Westbrook Village East a channel along the southern boundary north of Union Hills has a slope towards New River in which a maximum flow diversion of 100cfs is assumed. Weir flow occurs over street crown over a reach length of 2660 ft of Union Hills Road. Using broad crested weir formula: Q = CLH**1.5 where C = 2.6, L = crest length and H = head over street crown, the flow distribution is as follows:

Head(ft) (abv.crown)	91st Avenue	CClub Rd L=660'	87th Ave L=680'	89the Ave L=1320'	Total Q
0.0	80	0	0	0	80
0.25	115	214	221	429	979
0.50	225	607	625	1213	2670
1.00	545	1716	1768	3432	7461
1.50	750	3152	3248	6304	13454

The 80 cfs at 91st Avenue was obtained from H-Q plot of Erie's rating table for Union Hills Road.. Using cross slope of 2% the flow depth on Union Hills will be 0.65' with 80 cfs flow westward along Union Hills Road. Crown overflow or weir flow will occur as soon as there is a head above the street crown. Head is assumed as average depth over the crown since it has a westward slope of about 0.15%.

Table 4 shows assumptions for split flow or diversion at selected road intersections It should be noted that where Erie's data are cited actual diversion depends on rated discharge at specified depths of water at the center of the road crossings. Actual diversion can be determined from the model results.

Table 4 - Split Flow Assumptions at Selected Concentration Points

C. P.	LOCATION	DIVERSION
CPD2	89th Avenue x Calle Lejos	137 cfs eastward to 83rd Avenue per American Engineering Co Report
CPC2	91st Avenue. x Pinnacle Peak Road	30% eastward to Pinnacle Peak
CPB4	92nd Avenue x Deer Valley Road	50% eastward to 91st Avenue
CPC5	91st Avenue x Beardsley Road	30% eastward to west inlet of West brook village East
WBEO	South.Entrance WBE x Union Hills Road.	100 cfs to New River, then flow splits westward along Union Hills and southward to Country Club Road per Erie's data
DS87S	91st Avenue x 87th Avenue	Split depends on weir flow over road.crown for a length of 680'
DS89	91st Avenue x 89th Avenue	Split depends on weir flow over road crown for a length of 1320'
91ST	91st Avenue x Union Hills Road	Split as per Erie's data
CPG2	89th Avenue x Bell Road	50% up to 150 cfs eastward thru Bell Road to New River
CPG4	91st Avenue x Bell Road	Split as per Erie's data
CPH1	87th Avenue x Paradise Lane	Split as per Erie's data
CPH5	91st Avenue x Greenway Road	Diversion as per FCD Triple Box Culvert design and Erie's rating table

Figure 3 shows the schematic diagram of the hydrologic network showing points where split flows are occurring. The split at concentration point CPD2 was introduced in view of the presence of a swale north of Calle Lejos Rd. east of 88th Avenue with a capacity of 137 cfs going eastward to 83rd Avenue. Since the diversion will pass through concentration point CPE1 a BI record was used to maintain the earlier model version.

The most significant split flows are those occuring at the south outlet of Westbrook Village East where flow splits into three outlets, part goes to New River, part goes southward to Country Club Road and part flows westward along Union Hills Road. The flow diverted to Country Club Road is eventually lost to New River..

10. HEC-1 MODEL RESULTS

Appendix I shows the results of the HEC-1 modeling. This includes all the changes that have been discussed with the City of Peoria as briefly explained in the KM records and also a diagram of the hydrologic network and other information.

Sub-basins G1 and G2 boundaries have been revised to reflect changes in the area due to sub-division development which resulted in much greater onsite runoff being drained directly into New River. In the earlier model drainage area of G1 and G2 are much greater.

Table 5 shows summary of estimated peak discharge from 100-year 6-hour rainfall at selected concentration points using "normal" antecedent moisture conditions. A dry condition would have resulted in lower peak discharge estimates.

Table 5-Summary of Peak Discharge from 100yr-6hr Rainfall at Selected Concentration Points

CONC. POINT	INTERSECTION LOCATION	D.A. (sq.miles)	PEAK Q (normal)
CPC2	91st Ave & Pinnacle Peak Road	0.29	230
CPC3	91st Ave & Williams Road	0.33	237
CPC4A	91st Ave & Deer Valley Road	0.40	285
CPC5	91st Ave & Beardsley Road	0.52	471
CP91	91st Ave & Union Hills Road	4.87	698
CPG4	91st Ave & Bell Road	9.02	1257
CPH5	91st Ave & Greenway Road	9.57	1369
CPD10	89th Avenue. & Williams Road	0.69	607

CPD11	89th Avenue & Deer Valle Road	0.77	672
CPD3	87th Avenue & Pinnacle Peak	0.32	92
CPD5	87th Avenue & Deer Valley Road	0.63	378
CPF2	83rd Avenue & Pinnacle Peak	0.39	160
CPF3	83rd Avenue & Williams Road	0.57	312
CPF4	83rd Avenue & Deer Valley	0.70	436
CPF6	83rd Avenue & Beardsley Road	1.39	782
WBE1	W. Inlet of Westbrook Village East	1.72	1236
WBE2	E. Inlet of Westbrook Village East	1.75	525
WBEOT	Outlet of Westbrook Village East	4.06	1668
CPB7	Inlet of Westbrook Village West	2.53	614
CP93	93rd Avenue & Union Hills Road	8.40	204
CPG1	87th Avenue & Meadow Drive	0.03	365
CPG2	87th Avenue & Bell Road	0.10	340
CPG3	89th Avenue & Bell Road	0.36	521
CPG5	93rd Avenue & Bell Road	9.22	411
CPH2	About 1/4 Mile S. Bell Rd at 91st	0.06	893
CPH4	1/2 Mile S. Bell Rd at 93rd Avenue	9.50	1362
CPH6	Outlet of 91st Ave Drain to New River	9.80	1310

11. PEAK DISCHARGE OF VARIOUS RETURN PERIODS

A multiple-ratio plan run using JR record in the HEC-1 input is performed to provide peak discharge estimates of return periods 2, 5, 10, 25, and 50 years. Appendix J shows the summary of peak flow estimates. Table 6 is a summary of estimated peak discharge for selected concentration points.

Table 6 - Summary of Peak Discharge of Various Frequencies

C.P.	LOCATION	2-yr	5-yr	10-yr	25-yr	50-yr
CPC2	91st Ave. at Pinnacle Peak	14	58	90	140	185
CPC4	91st Ave. at Deer Valley Rd.	13	70	132	240	324
CPC5	91st Ave. at Beardsley Rd.	18	84	156	279	377
CPD10	89th Ave at Williams Rd	48	150	246	391	503
CPF6	83rd Ave at Beardsley Rd.	105	237	346	516	650
CP93	93rd Ave. at Union Hills Dr.	23	44	76	119	166
WBEO	Westbrook Village East outlet	39	58	312	938	1365
CPG4	91st Avenue at Bell Rd.	117	226	323	594	940
CPG5	93rd Ave. at Bell Road	48	103	146	217	295
CPH5	91st Ave at Greenway Rd.	144	315	453	662	1006
CPH6	91st Ave Drain Outlet.	159	360	527	771	1051

12. DISCUSSIONS

12.1 . EXISTING AND FUTURE CONDITIONS

The HEC-1 model is formulated using existing condition of the area. The effect of future land use changes, especially with many proposed subdivision projects and the re-zoning of the state land north of Beardsley Road, could be incorporated in the model to reflect future condition. Effect of Arrowhead Cove subdivision is not included. It must be pointed out that the Westbrook Village East inlets design capacity is only up to a total of 1000 cfs (28.3 m^3/s) as per design of Carter & Associates, Inc. The FCD updated model shows a total of 1761 cfs (49.9 m^3/s) for the two north inlets. This was based on the assumption that about 70% of flow at the intersection of 83rd Avenue and Beardsley Road will move southward and eventually discharge into New River.

12.2 . SWMM VERSUS HEC-1 MODEL

In the final report of Dibble & Associates, dated March 15, 1989, the SWMM results showed a 2-year 2-hour peak discharge of 743 cfs at the outlet of 91st Ave. Drain. The SWMM model

covers a total watershed area of 4.65 sq. miles (12 km^2) (below Pinnacle Peak Road) with 32.6% impervious area. The HEC-1 model covers 9.80 sq. miles (25 km^2) with a weighted percent impervious area of about 15%. The discrepancy in drainage area is mainly due to the fact that the Dibble & Associates model excluded a large area to the north of Pinnacle Peak Road; most of which are under natural desert condition. The design capacity of the existing drain along Greenway Road is 750 cfs (21 m^3/s) which was based on the results of the SWMM model used by Dibble & Associates in 1989.

12.3 . WESTBROOK VILLAGE OFFSITE RUNOFF

The 100-yr peak flow estimate of UDC (report dated 1983) at Beardsley Road is 733 cfs (20.75 m^3/s) for 2.49 sq. miles (6.4 km^2) watershed north of Westbrook Village West. Assumed curve number of 88 seems too high as the area is mostly under natural desert condition. In the updated model, the estimated peak discharge is only 614 cfs (17.4 m^3/s) for watershed of 2.53 sq. miles (6.55 km^2). Thus, it could be assumed that all the offsite runoff can be accommodated by the existing retention basins and therefore no outflow into Union Hills Road. About 25 cfs was assumed to be the outflow from the development at Union Hills to bleed off the retention within the development.

Offsite runoff estimate for Westbrook Village East by Carter & Associates (1989) at Beardsley Road was 887 cfs (25.1 m^3/s) for 4.29 sq. miles (11 km^2) using an SCS curve number of 81.25 which may be too low considering that the soil types in the area are clay to clay loam with very low infiltration rates. In the updated model, the peak flow at the west inlet including diversion from 91st Avenue along Beardsley Road is 1236 cfs (35 m^3/s); and 525 cfs (14.9 m^3/s) at the east inlet after excluding southward flow through 83rd Avenue. The total flow of 1761 cfs is coming from 3.27 sq. miles. As per drainage master plan of Westbrook Village East, the total design capacity of the inlets is 1000 cfs (28.3 m^3/s).

The drainage master plan of Westbrook Village East includes 10 retention basins which were primarily designed to retain only the 10-year onsite runoff. The HEC-1 model of Carter & Associates, Inc used the initial and uniform loss rates with an outflow at the south entrance of about 700 cfs (19.8 m^3/s) versus 1668 cfs (47.2 m^3/s) in the updated model.

12.4. INCLUSION OF RETENTION BASIN IN WESTBROOK VILLAGE WEST

An estimated 472 ac-ft of available storage has been reported by Universal Development Corporation's consultant Collar, William & White Engineering, Inc. in 1983 for the drainage master plan of Westbrook Village West. Based on field reconnaissance and on assessment by Erie & Associate, Inc., the actual capacity was estimated to be only about 350 acre-feet. The subdivision is already well developed with several golf courses in place. In the model it was assumed that outflow will occur only after 350 acre-feet storage has been satisfied. The model results show that all offsite runoff from the north as well as the onsite runoff is retained with only storage outflow of about 50 cfs through 2-24" pipe culvert across Union Hills Road.

12.5. INCLUSION OF 91ST DRAIN DIVERSION SOUTH OF GREENWAY ROAD

Finally, at the intersection of 91st Avenue and Greenway Road, the effect of the existing triple barrel 10' x 6' x 183.8' box culvert is included in the model. During events greater than the design, flows are diverted south on 91st Avenue. The Calbrisa proposal called for 550 ft (168 m) weir to discharge about 2500 cfs (71 m^3/s) and bring down flow to 1800 cfs (51 m^3/s) along Greenway Road to New River. The updated model uses data on flow rating provided by Erie & Associates, Inc., which determined that of the total 100-year 6-hour runoff of 1369 cfs (38.8 m^3/s), about 89% will pass through the existing 91st Avenue drainage channel into New River and about 11% (141 cfs) will move down southward through 91st Avenue.

13. CONCLUSIONS AND RECOMMENDATIONS

The eastern portion of the watershed has high runoff potential due to presence of clay loam soil types. This was not properly considered by previous models in the area. This accounts for much larger offsite runoff into Westbrook Village East than the estimated peak flow in the HEC-1 model used in the design of the drainage master plan of the area.

The retention basins in Westbrook Village West are effective in storing onsite and offsite 100-year 6-hour storm runoff. With the 350 ac-ft storage the outflow into Union Hills Road is zero.. On the other hand , based on re-runs of the HEC-1 model for the Westbrook Village East, it was found that the 10 retention basins are effective only in retaining the 100-year 2-hour offsite runoff.

Diversion outflows from the system consist of the 70% southward diversion through 83rd Ave at Beardsley Road intersection which amounts to 547 cfs(15.5m3/s), the diversion of 100 cfs (2.83 m3/s) north of Union Hills Road into New River, the diversions through Country Club Road just south of Westbrook Village East of 350 cfs(9.9 m3/s) to New River, the diversion of a maximum of 150 cfs (4.25 m3/s) through Bell Road to New River and the diversion of 141 cfs (4.0 m3/s) through the triple barrel box culvert at intersection of 91st Avenue and Greenway Road southward into 91st Avenue. The total diversion outflow from the system is 1288 cfs (36.5 m3/s). It must be emphasized that this outflow was not considered in previous HEC-1 models of the area.

Estimated peak flows south of Beardsley Road can be decreased by considering future flow diversions into 99th Avenue, and also diverting part of the flow at the crossing of 83rd Avenue and future Beardsley Road extension eastward in which there is high possibility of being considered by the proposed Fletcher Heights Subdivision project. Also, an increased eastward diversion into New River along Union Hills Road and along Bell Road can be beneficial if the capacity of existing sub-surface and surface drainage systems can be increased..

The available storage in the golf course in the Westbrook Village West should be checked for their actual storage capacities.

New land development projects should not be allowed to discharge flow in excess of the estimates for the present condition. Enforcing retention basin criteria will greatly reduce flooding problems in the watershed as has been shown with the West Brook Village development.

The Bell Road Project Drainage Study proposed conduits to carry 2-year peak flows only. The 42" CMP (2700 ft) along Union Hills was designed for 32 cfs (0.9 m^3/s) and the 54" RCP (1820 feet) along Bell Road was designed for 48 cfs (1.4 m^3/s). Should the City of Peoria decide on a 100-year flood protection, then open channels along these existing conduits can be investigated and comnpared with other alternatives. It may be more economical to add additional retention basins north of Beardsley Road which is mostlly undeveloped..

The drainage plan of the proposed Fletcher Heights east of 83rd Avenue should take into consideration the possibility of discharging offsite and onsite runoff in eastward direction towards New River instead of discharging into interceptor channel in the Westbrook Village East.

With more data on the proposed drainage master plans, detention basins, routing reaches, land use changes and split flows at some of the street intersections, modification of the HEC-1 model can be done with proper coordination among interested parties. Future subdivision projects should consider design data for the existing culverts, pipelines and open channels where available to insure effective storm drainage system for the area.

In order to have a check on the actual flow in the 91st Avenue Drain, a crest gauge could be installed near its outlet (free from backwater) to be observed whenever significant flooding occurs in the area.

14. REFERENCES

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91ST AVENUE HYDROLOGIC STUDY

HEC-1 DRAINAGE NETWORK

Prepared by: WATERSHED MANAGEMENT BRANCH

FLOOD CONTROL DISTRICT

MARICOPA COUNTY MARCH 1994

In cooperation with: CITY OF PEORIA

DEVELOPMENT SERVICES DIVISION

DRAFT

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

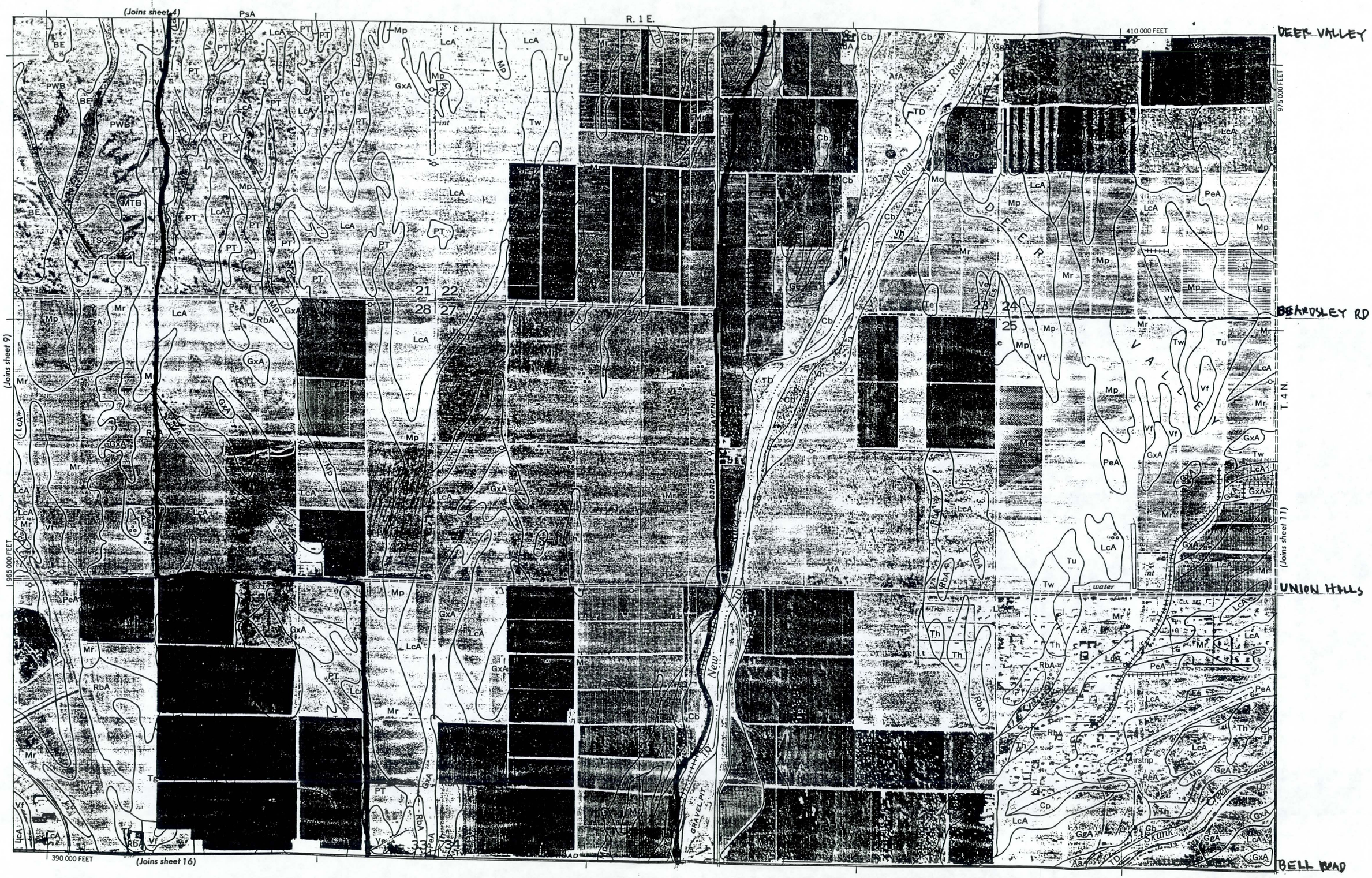
FIGURE 1

MARICOPA COUNTY, ARIZONA, CENTRAL PART — SHEET NUMBER 4

FIGURE 2

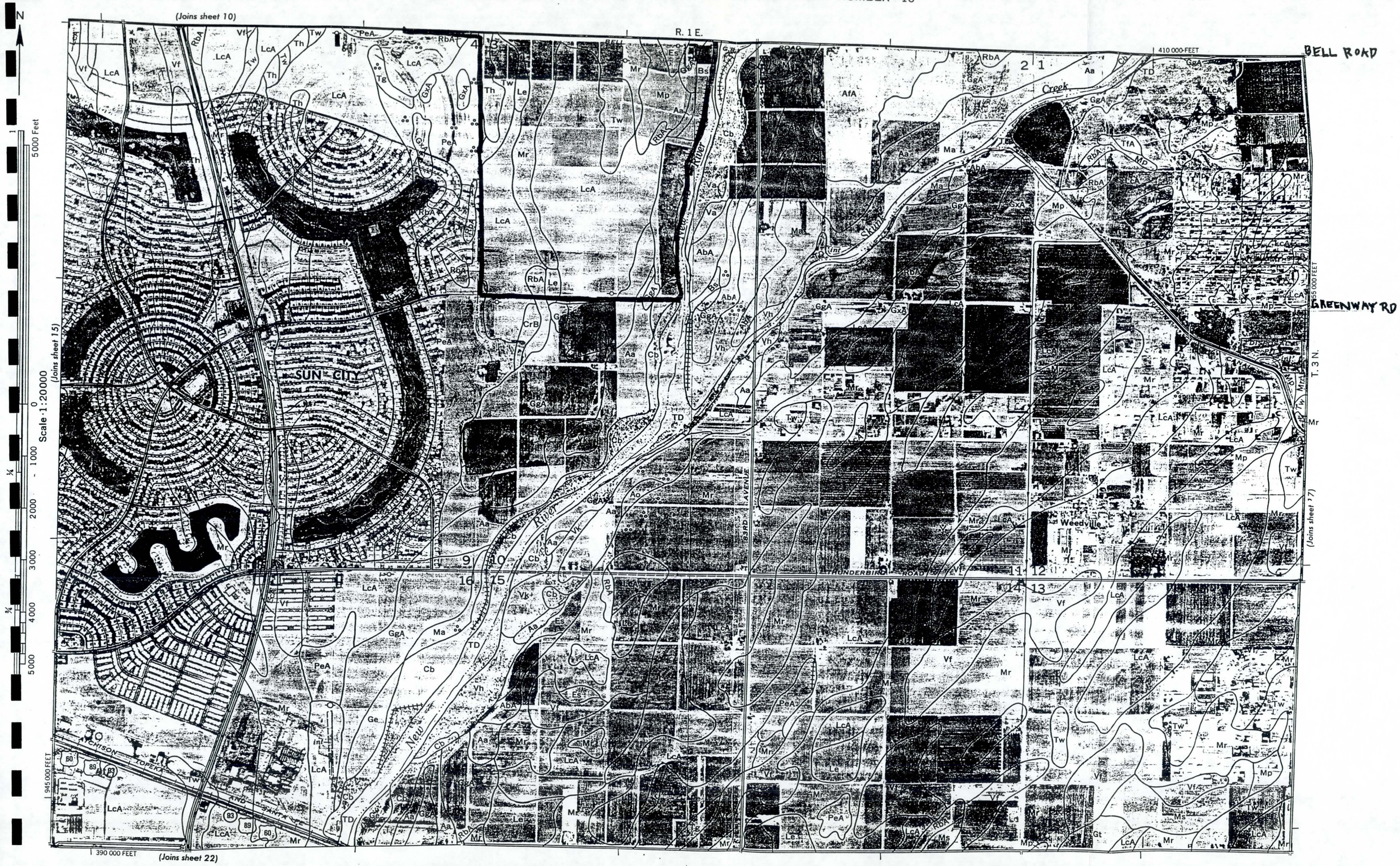
This map is compiled on 1973 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MARICOPA COUNTY, ARIZONA, CENTRAL PART — SHEET NUMBER 10

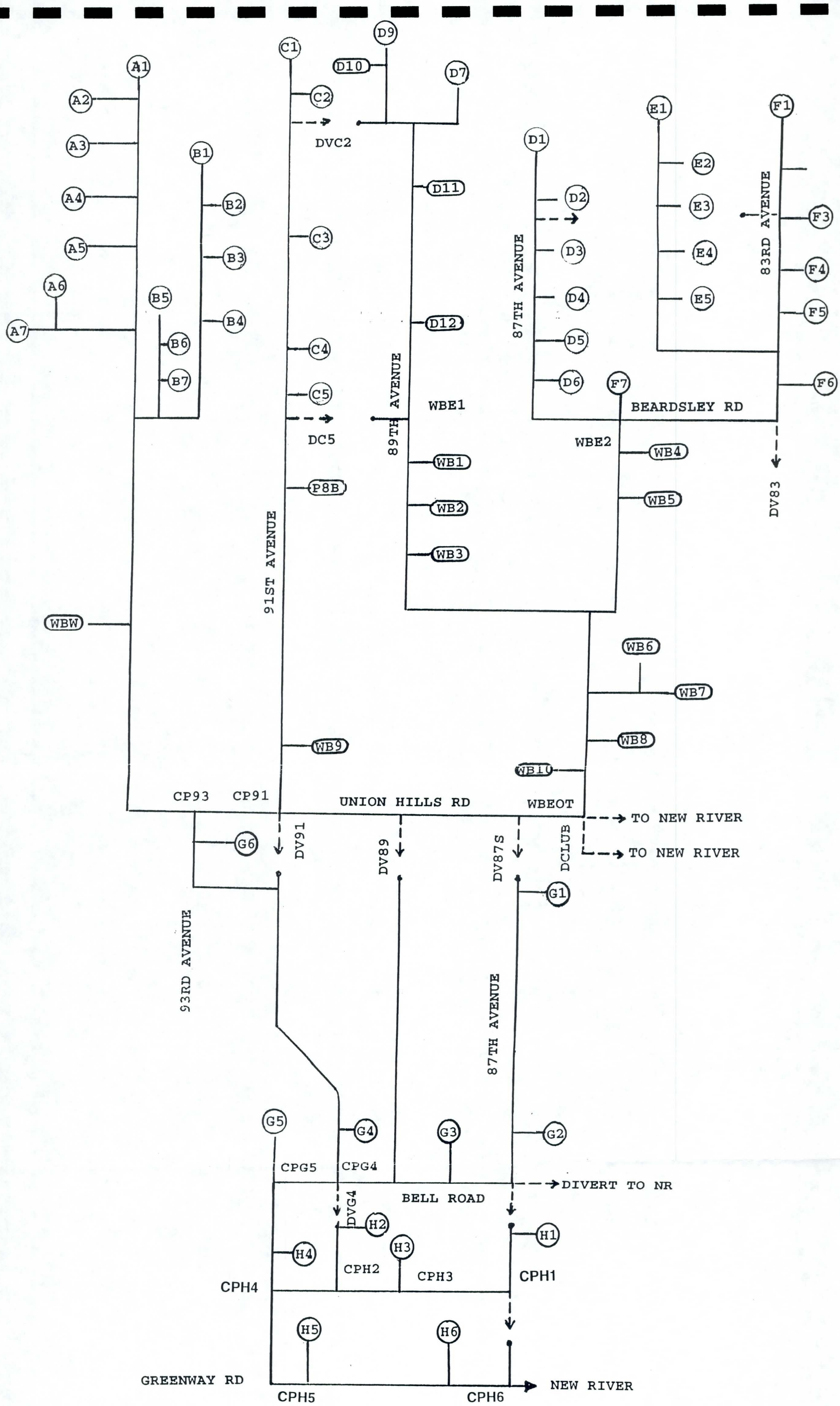


This map is compiled on 1973 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

MARICOPA COUNTY, ARIZONA, CENTRAL PART — SHEET NUMBER 16



This map is compiled on 1973 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

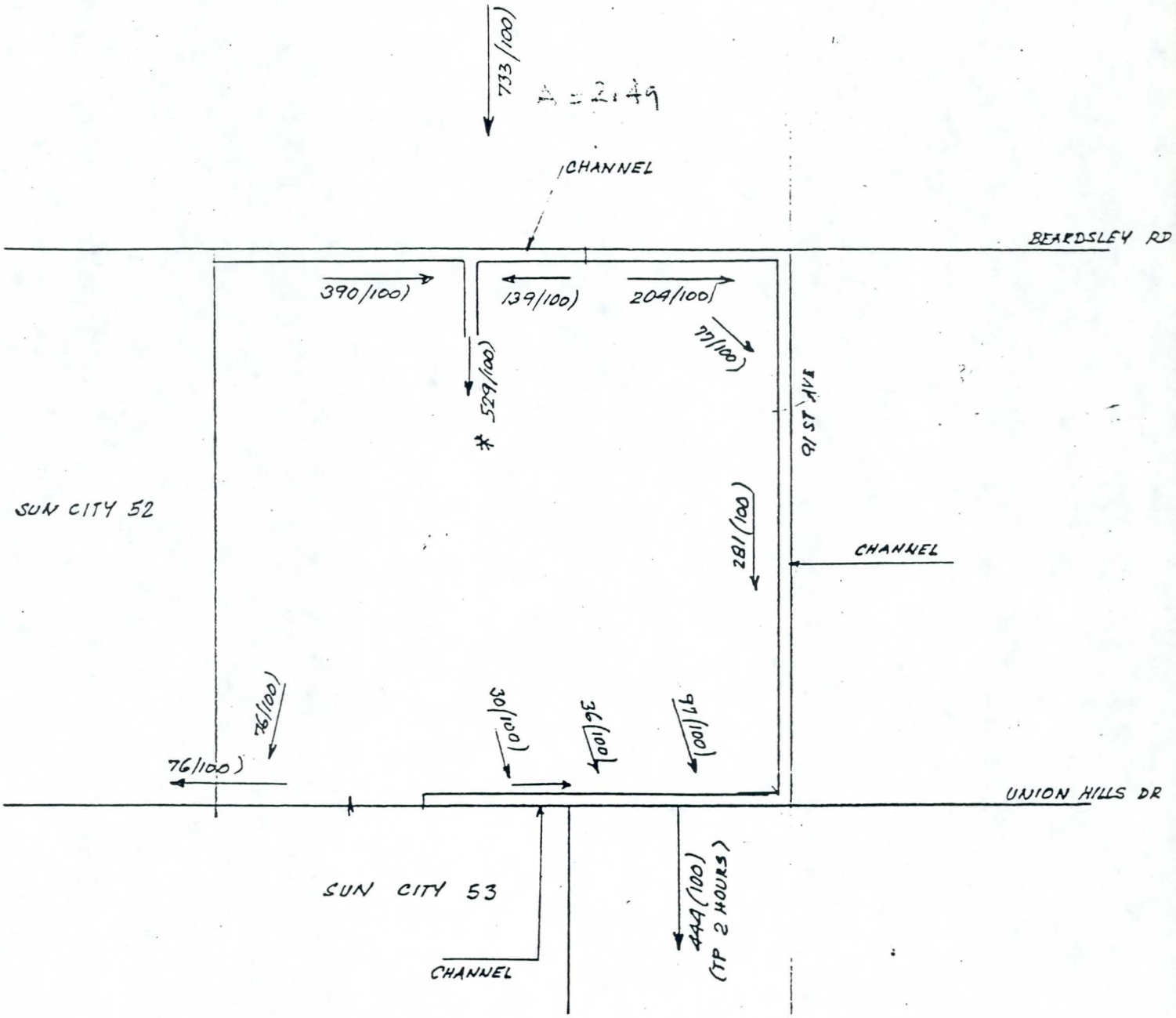


91ST AVENUE WATERSHED
SCHEMATIC DIAGRAM OF HYDROLOGIC MODEL

FIGURE 3

APPENDIX A

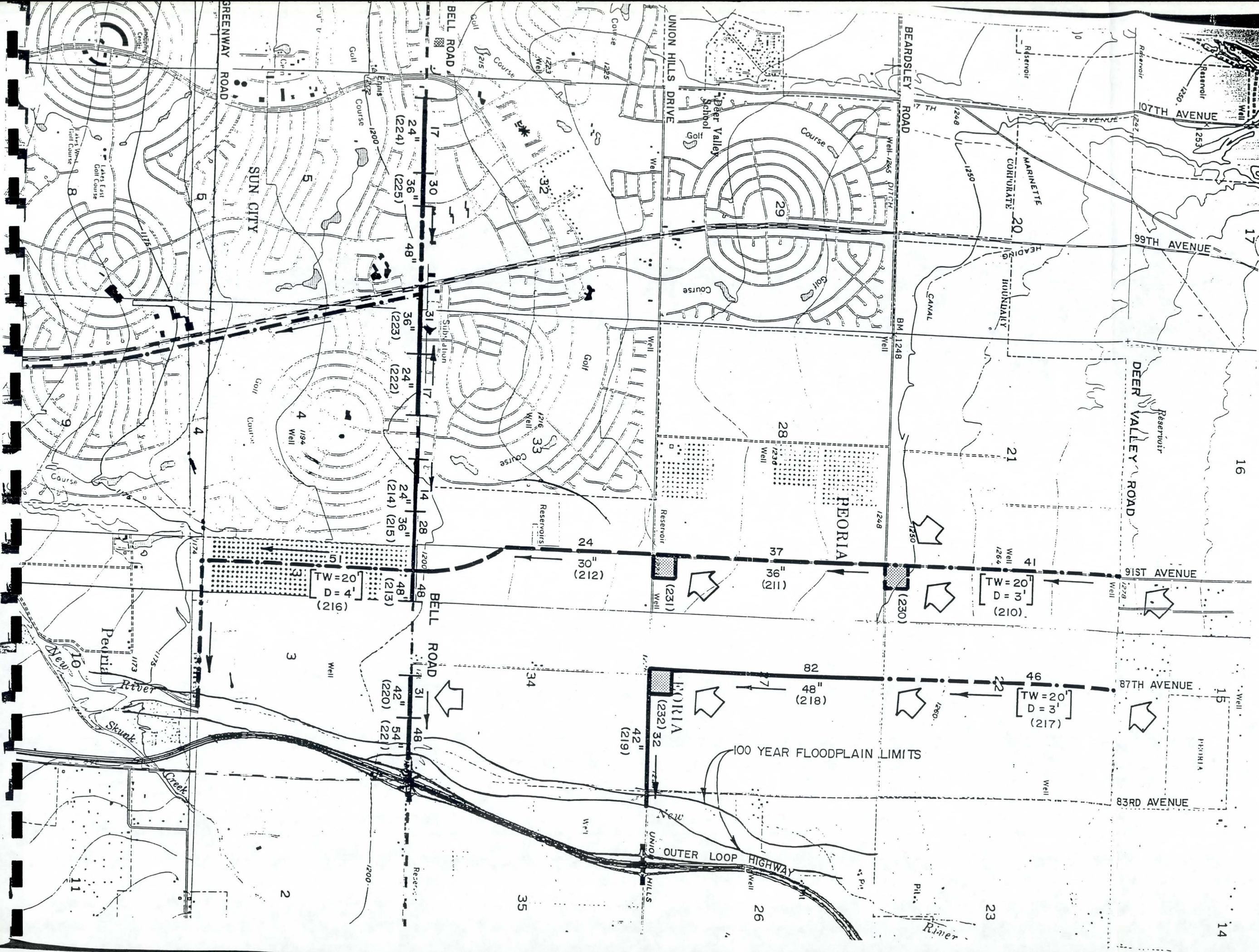
DEVELOPED CONDITIONS



* DETAIN IN GOLF COURSE FOR 9 HOURS

REDUCTION IN OVERFLOW IN UNION HILLS DR EAST OF SUN CITY 53 –
757 – 444 — 41%

REDUCTION IN FLOW VIA PVMT UNION HILLS DR BETWEEN SUN CITY 52-53
200 - 76 — 62%


APPENDIX
N
2000 0 2000
1" = 2000' feet
LEGEND
CONDUIT
OPEN CHANNEL
DETENTION BASIN
51 PEAK FLOW IN CFS
36" STRUCTURE SIZE FOR CONDUITS
(714) STRUCTURE NUMBER
OPEN CHANNELS
TW=20' D=3' TOP WIDTH DEPTH
FACILITIES PROPOSED BY THIS STUDY
PROPOSED OR EXISTING FACILITIES FROM AREA MASTER DRAINAGE STUDIES
GREENWAY ROAD
BELL ROAD
UNION HILLS DRIVE
BEARDSLEY ROAD
DEER VALLEY ROAD
107TH AVENUE
99TH AVENUE
91ST AVENUE
87TH AVENUE
83RD AVENUE
SUN CITY
PEORIA
MARINETTE CANAL
CORPORATE HEADING BOUNDARY
Deer Valley School
Lakes West Golf Course
Lakes East Golf Course
Sewage Center
Subdivision
Reservoir
Well
Ditch
Pit
New River
Skunk Creek
Rainer
OUTER LOOP HIGHWAY
100 YEAR FLOODPLAIN LIMITS
24" (224)
36" (225)
36" (223)
24" (222)
24" (214)
36" (215)
48" (213)
TW=20' D=4' (216)
24 30" (212)
37 36" (211)
(231)
(230)
41 TW=20' D=3' (210)
82 48" (218)
46 TW=20' D=3' (217)
(232)
42" (219)
42" (220)
54" (221)
PLATE 2
SELECTED PLAN
DRAINAGE AREA 2
BELL ROAD PROJECT
DRAINAGE STUDY
Greiner Engineering

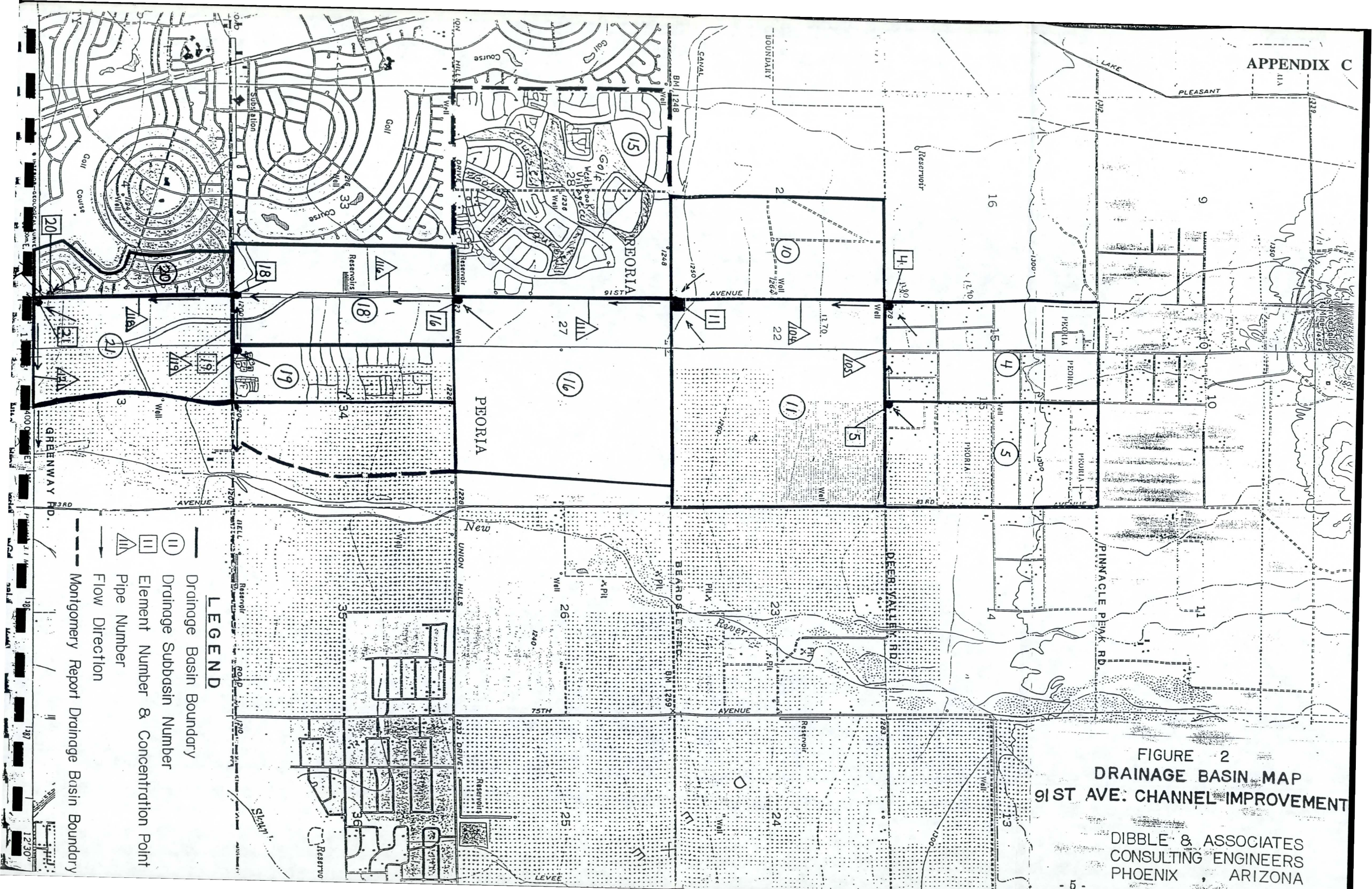
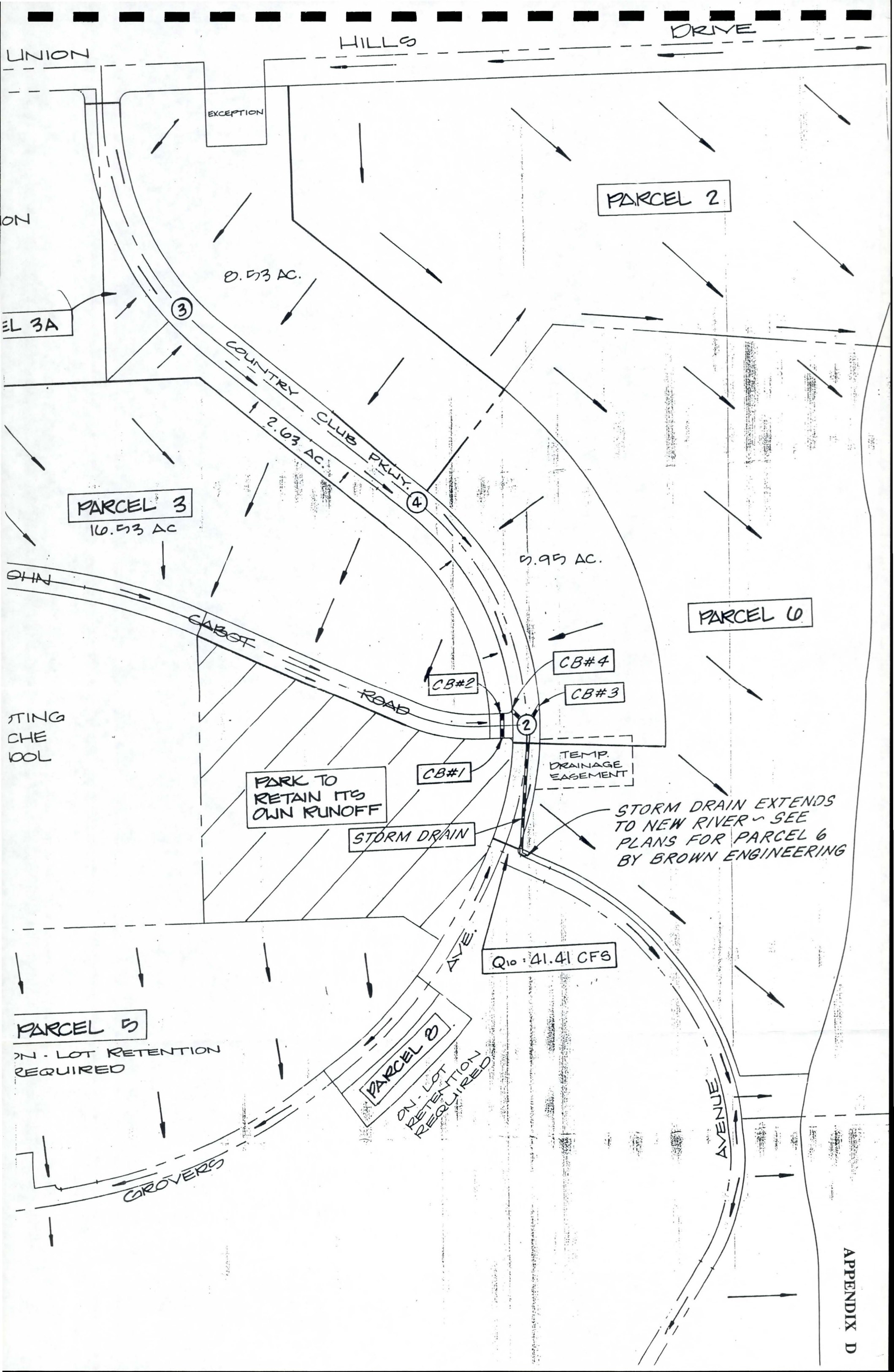


FIGURE 2
DRAINAGE BASIN MAP
91 ST AVE. CHANNEL IMPROVEMENT

DIBBLE & ASSOCIATES
CONSULTING ENGINEERS
PHOENIX , ARIZONA


UNION
HILLS
DRIVE
EXCEPTION
PARCEL 2
0.53 AC.
EL 3A
3
COUNTRY CLUB PKWY.
2.63 AC.
4
PARCEL 3
16.53 AC
5.95 AC.
CABOT
ROAD
PARCEL 6
CB#4
CB#2
CB#3
2
TEMP. DRAINAGE EASEMENT
CB#1
PARK TO RETAIN ITS OWN RUNOFF
STORM DRAIN
STORM DRAIN EXTENDS TO NEW RIVER ~ SEE PLANS FOR PARCEL 6 BY BROWN ENGINEERING
AVE.
Q10 : 41.41 CFS
PARCEL 5
ON - LOT RETENTION REQUIRED
PARCEL 8
ON - LOT RETENTION REQUIRED
GROVERS
AVENUE

APPENDIX D

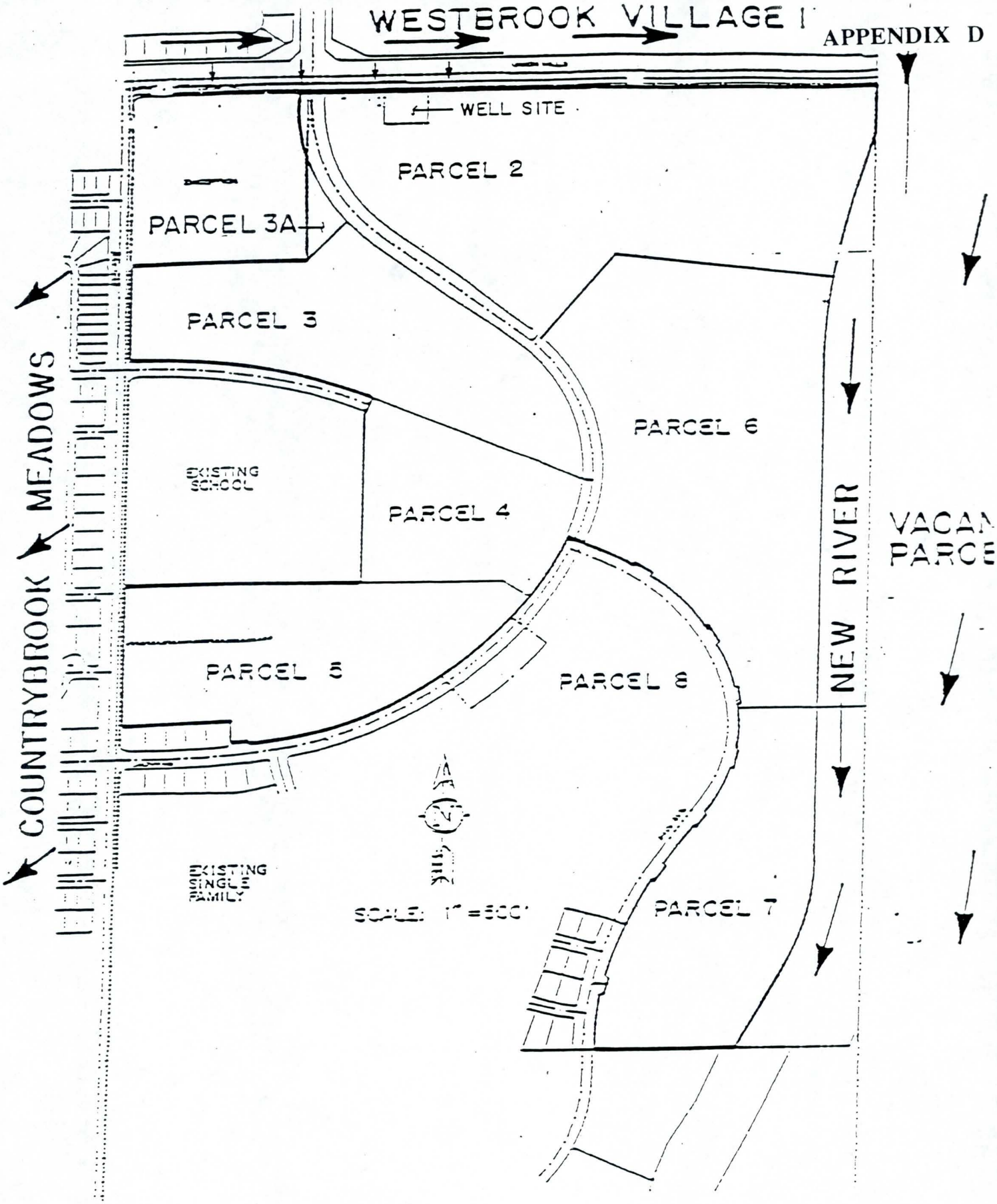
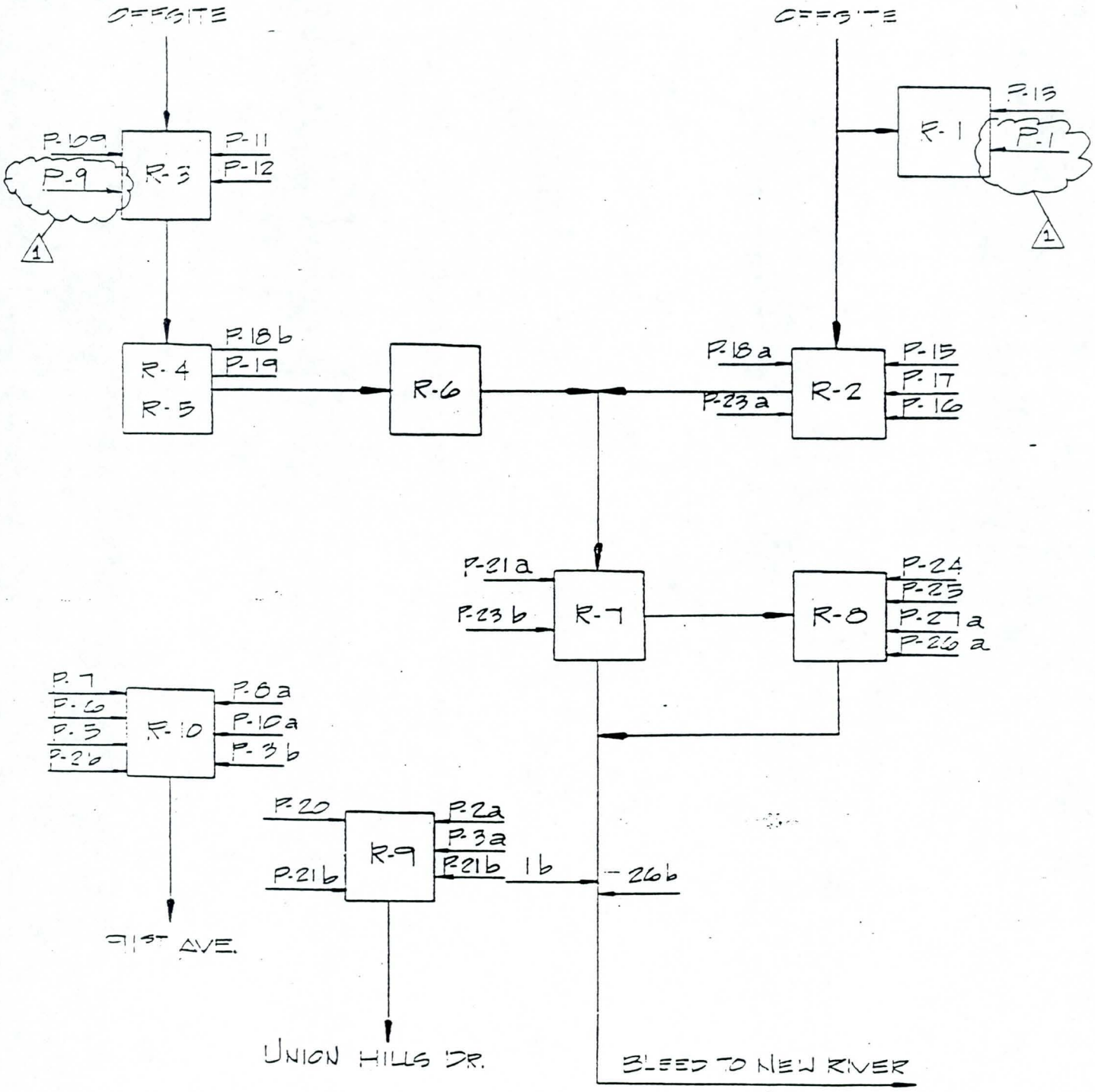


FIGURE 2
OFF-SITE HYDROLOGY

WESTBROOK VILLAGE SECTION DRAINAGE SYSTEM

APPENDIX E



LEGEND

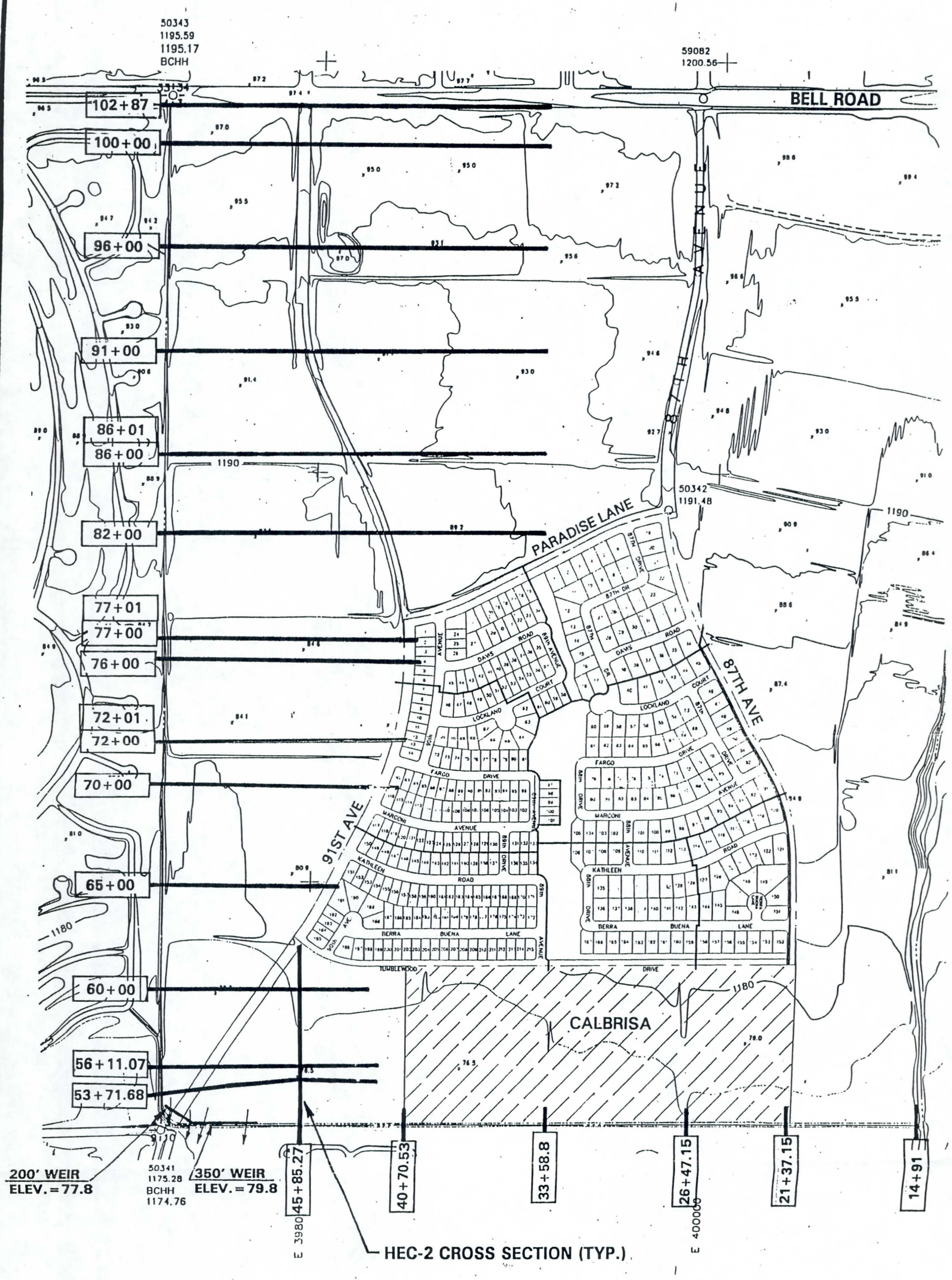
P-3a PARCEL AREA TRIBUTARY TO RETENTION

R-4 RETENTION BASIN

1 PROPOSED REVISION, PARCEL 9 & 14 CHANGE FROM COMMERCIAL WITH ONSITE RETENTION TO SINGLE FAMILY WITH RETENTION IN THE GOLF COURSE. 9-91

CARTER ASSOCIATES, INC.
CONSULTING ENGINEERS, PLANNERS & SURVEYORS

FIG. F-3



Note: 0.8' should be added to these elevations to convert to the Calbrisa design plans datum

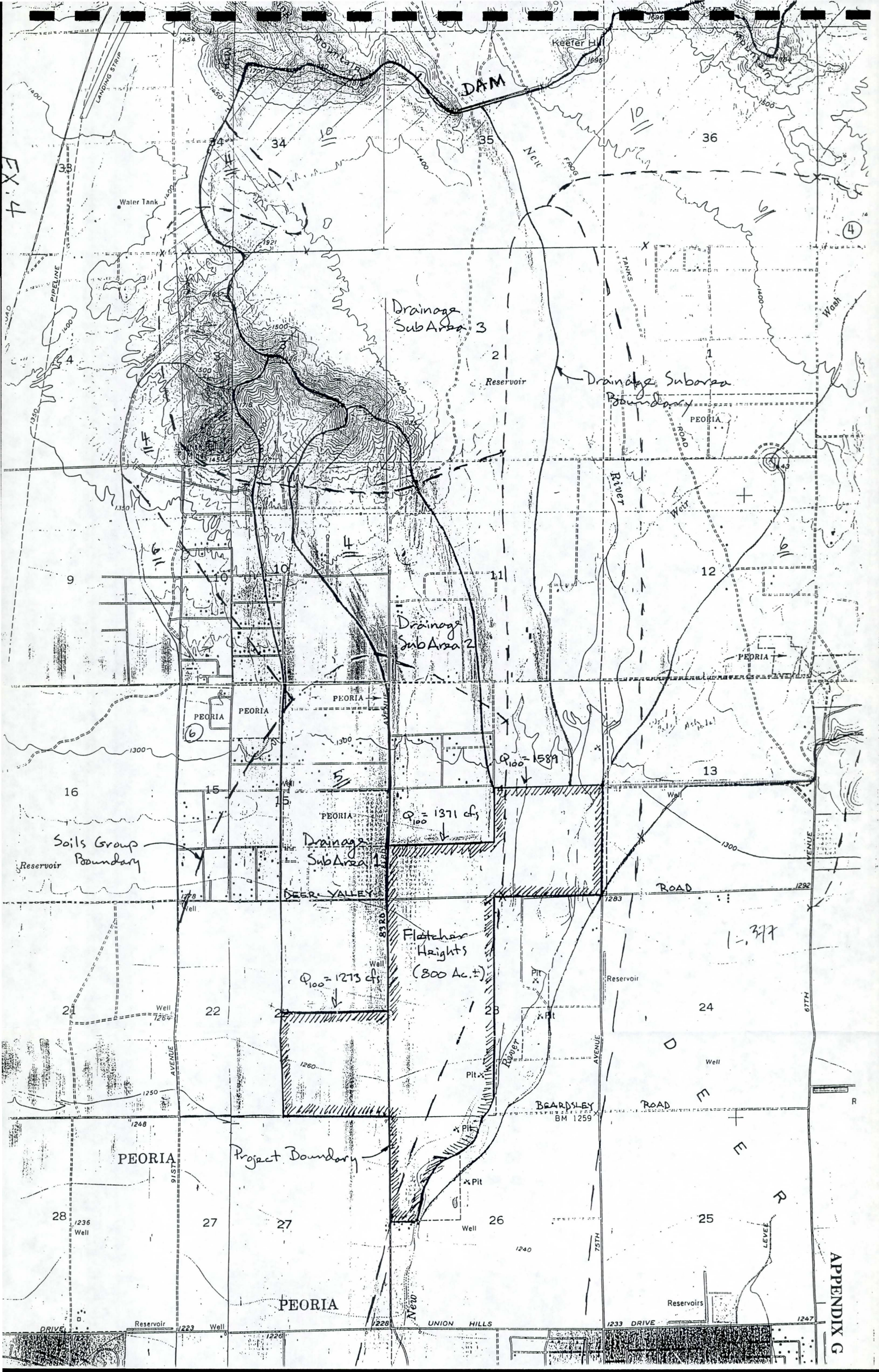
1" = 500'

HEC-2 CROSS SECTION LOCATION MAP

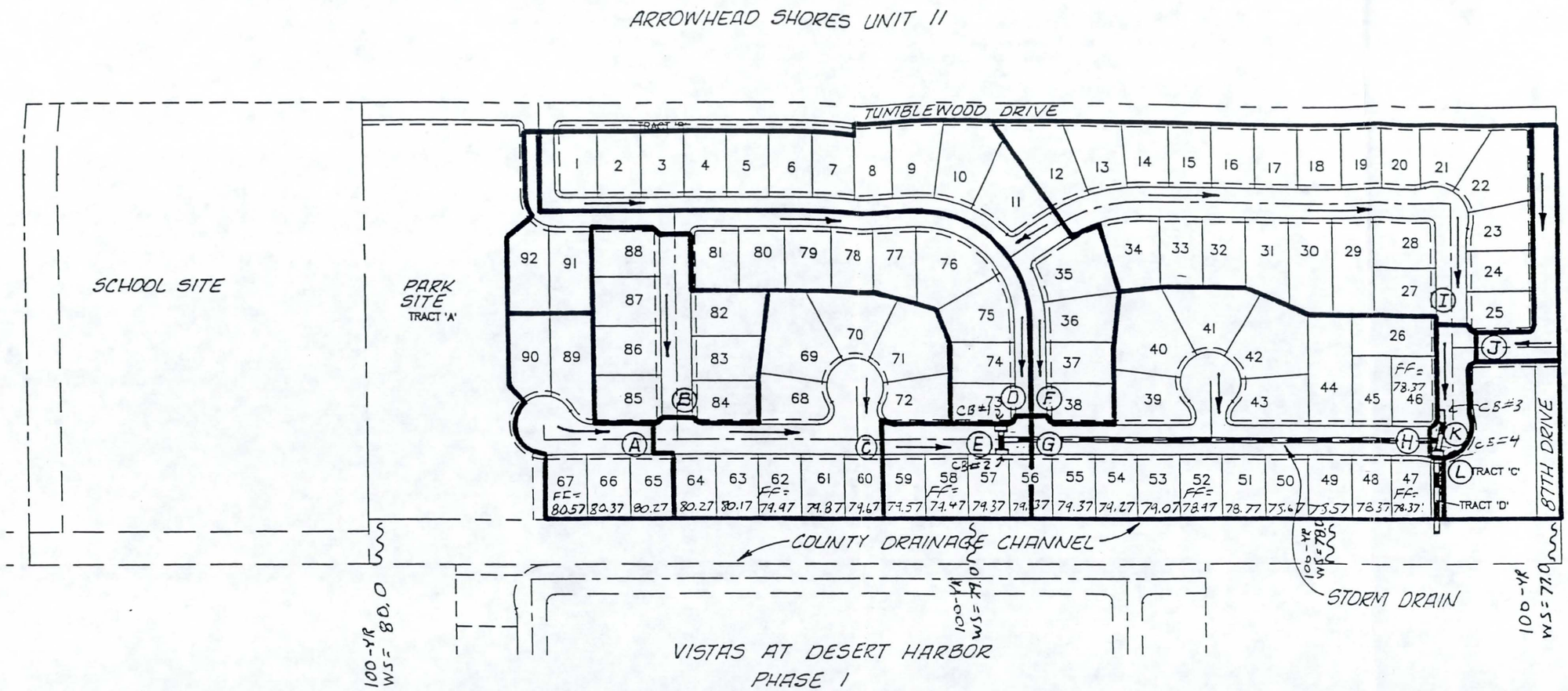
PLATE 4

COE & VAN LOO
PLANNING • ENGINEERING
LANDSCAPE ARCHITECTURE

APPENDIX F


DAM
Keefer Hill
Mountain
LANDING STRIP
Water Tank
PIPELINE
Drainage Sub Area 3
Reservoir
Drainage Subarea Boundary
PEORIA
ROAD
River
Weir
Wash
Drainage Sub Area 2
Q_{100} = 1589
Q_{100} = 1371 cfs
Soils Group Boundary
Drainage Sub Area 1
DEER VALLEY
Fletcher Heights (800 Ac.±)
Q_{100} = 1273 cfs
Project Boundary
BEARDSLEY
BM 1259
Pit
Well
Reservoir
AVENUE
91ST
83RD
75TH
67TH
UNION HILLS
DRIVE
LEVEE
Reservoirs
New
1-377

APPENDIX G



Note: These 100-YR Water Surfaces are on Calbrisa Datum, as are the Finished Floor elevations.

LEGEND

- DRAINAGE AREA BOUNDARY
- DIRECTION OF FLOW
- (A) CONCENTRATION POINT
- STORM DRAIN

NTS

CALBRISA

DRAINAGE MAP

PLATE 2

COE & VAN LOO
PLANNING · ENGINEERING
LANDSCAPE ARCHITECTURE

ERIE & ASSOCIATES, INC.
CONSULTING ENGINEERS

APPENDIX I

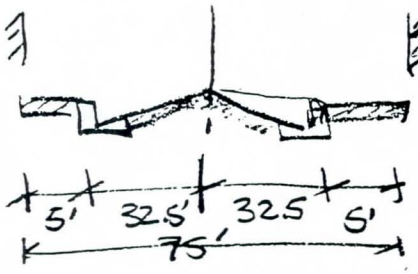
JOB NO. 4163 SHEET 1/6

PROJECT Torrejon SUBDIV W/O QUE CALC. LE DATE JUN 94

SUBJECT Drainage - RATING CURVES for FLOW SPLITS IN HEC-1 CHKD. _____ DATE _____

TYPICAL ROAD X-SECS and Hydraulic properties

- Assume all cross slopes at 2%±, and n = .015 onwards
- UNION HILLS - SLOPES NO MEDIAN



SIDEBOARD @ BACK OF S/W

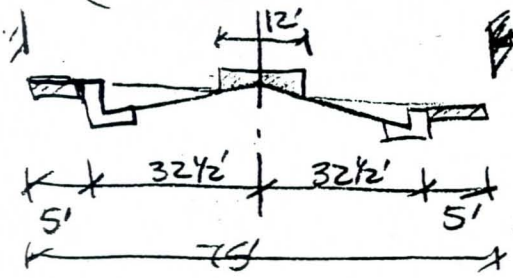
$S \cong \frac{25.9 - 19.2}{4400} \cong 0.0015'/'$

36th AVE to 92nd AVE

FULL ST capacity

D	A	WP	R	V	Q
0	0 SF	0'	0	0 FPS	0 CFS
0.5	16	32	0.5	2.7	43.
1.0	53.5	75	0.71	3.2	170.
2.0	128.5	75	1.7	5.5	710.
3.0	203.5	75	2.7	8.0	1630
4.0	278.5	75	3.7	9.0	2500.

- COUNTRY club
- (36th AVE): 4 lanes with raised median (south extension of West Brook Parkway)



SIDEBOARD @ BACK OF S/W $S = .008'/'$ per mike smith experience

FULL ST. CAPACITY

D (ft)	A (SF)	WP (ft)	R	V (fps)	Q (CFS)
0	0	0	0	0	0
0.5	13.25	53	0.25	3.5	46.
1.0	44.75	63.	0.7	7.0	310
2.0	113.75	75	1.5	12.0	365.
3.0	188.75	75	2.5	17.0	3200.
4.0	263.75	75	3.5	19.0	5000.

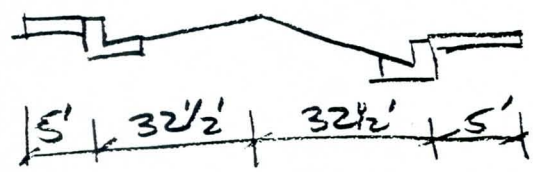
ERIE & ASSOCIATES, INC.
CONSULTING ENGINEERS

91V-6399

JOB NO. 1446.3 SHEET 2/6
PROJECT
CALC. CE DATE JUN 94
SUBJECT
CHKD. DATE

• 87th AVE: 5 lanes northbound
@ Union Hills

$S \cong \frac{2}{100} = .02\,1/1$



FULL ST. CAPACITY

D	A	wp	R	V	Q
0	0	0	0	0	0
0.5	16	32	0.5	9.0	145.
1.0	53.5	75	0.7	12.0	640.
2.0	128.5	75	1.7	20.0	2570.
3.0	203.5	75	2.7	25.0	5090.
4.0	278.5	75	3.7	32.0	8920.

• 91st AVE: 4 lanes northbound
@ Union Hills

$S \cong \frac{2}{150} = 0.0133$

FULL ST. CAPACITY

D	A	wp	R	V	Q
0	0	0	0	0	0
0.5	16	32	0.5	7.1	115.
1.0	53.5	75	0.7	9.0	480.
2.0	128.5	75	1.7	17.0	2180.
3.0	203.5	75	2.7	22.0	4480
4.0	278.5	75	3.7	25.0	6960.

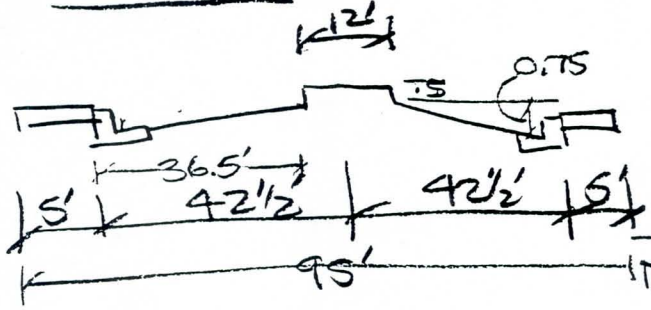
ERIE & ASSOCIATES, INC.
CONSULTING ENGINEERS

JOB NO. 1416.3 SHEET 3/6

PROJECT _____ CALC. LE DATE JUN 94

SUBJECT _____ CHKD. _____ DATE _____

• BELL ROAD – 6 lanes with median



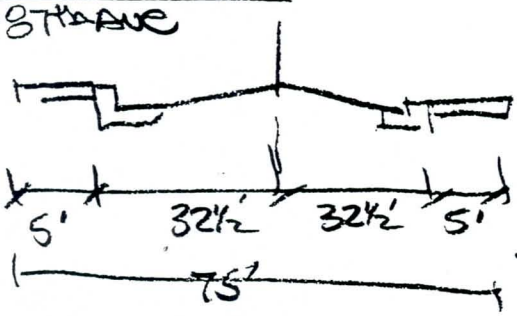
$S = \frac{1200.56 - 1196.}{2500} =$

$= 0.0018$ 1/1

FULL ST. CAPACITY

D	A	wp	R	V	Q
0	0	0	0	0	0
0.5	12.5	50.	0.25	1.7	21.
1.0	58.	47.5	1.22	5.0	290
2.0	150.	95	1.58	5.8	870.
3.0	245.	95	2.58	7.9	1935.
4.0	340	95	3.58	9.5	3230.

• Paradise Lane – @ 8th Ave



$S = \frac{1}{260} = 0.0038$

FULL ST. CAPACITY

D	A	wp	R	V	Q
0	0	0	0	0	0
.5	16	32	.5	4.0	64.
1.0	53.5	75	.7	4.8	260
2.0	128.5	75	1.7	8.5	1090.
3.0	203.5	75	2.7	12.0	2440.
4.0	278.5	75	3.7	16.0	4460.

ERIE & ASSOCIATES, INC.
CONSULTING ENGINEERS

JOB NO. 1416.3 SHEET 4/6

PROJECT _____ CALC. CE DATE June 94

SUBJECT _____ CHKD. _____ DATE _____

Arrowhead shares channel!

The channel is depressed 4' below the street and sidewalk along paradise lane without as a weir taking water off paradise lane into channel / park.

Assume a 50' weir length that will begin to take water at ½' depth in paradise lane. By broadcrested weir equation $Q = CLH^{3/2}$ where $C = 2.6$, $L = 50'$

D=H	Q
0	0
1.0'	130. cfs
2.0	370.
3.0	675.
3.5	850.

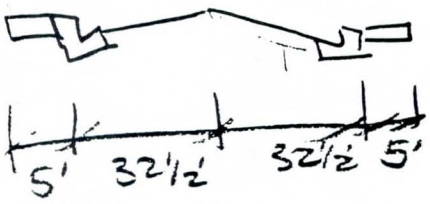
Assume will will start when flow in paradise is 1' at gutter

ERIE & ASSOCIATES, INC.
CONSULTING ENGINEERS

JOB NO. 14163 SHEET 5/6
PROJECT _____ CALC. LE DATE Jun 99
SUBJECT _____ CHKD. _____ DATE _____

- 8TH AVE : Slumes no motion @ S/O Bell

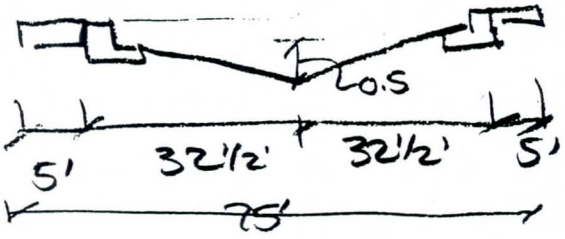
S = 0.0057'/'
per mike smith c/peoria.



FULL ST. CAPACITY

D	A	wp	R	V	Q
0	0	0	0	0	0
0.5	16	32	0.5	5.0	80.
1.0	53.5	75	0.7	5.8	310.
2.0	128.5	75	1.7	12.0	1540.
3.0	203.5	75	2.7	15.0	3050.
4.0	278.5	75	3.7	18.0	5000.

- 91st AVE S/O Bell : Slumes no motion inverted crown



S ≅ 2/400 = 0.005

FULL ST. CAPACITY

D*	A	wp	R	V	Q
0	0	0	0	0	0
0.5	16.25	65.	0.25	2.8	40.
1.0	81.25	65	1.25	9.0	730.
2.0	156.25	75	2.08	12.0	1875.
3.0	231.25	75	3.08	16.0	3700.
4.0	306.25	75	4.08	18.0	5510.

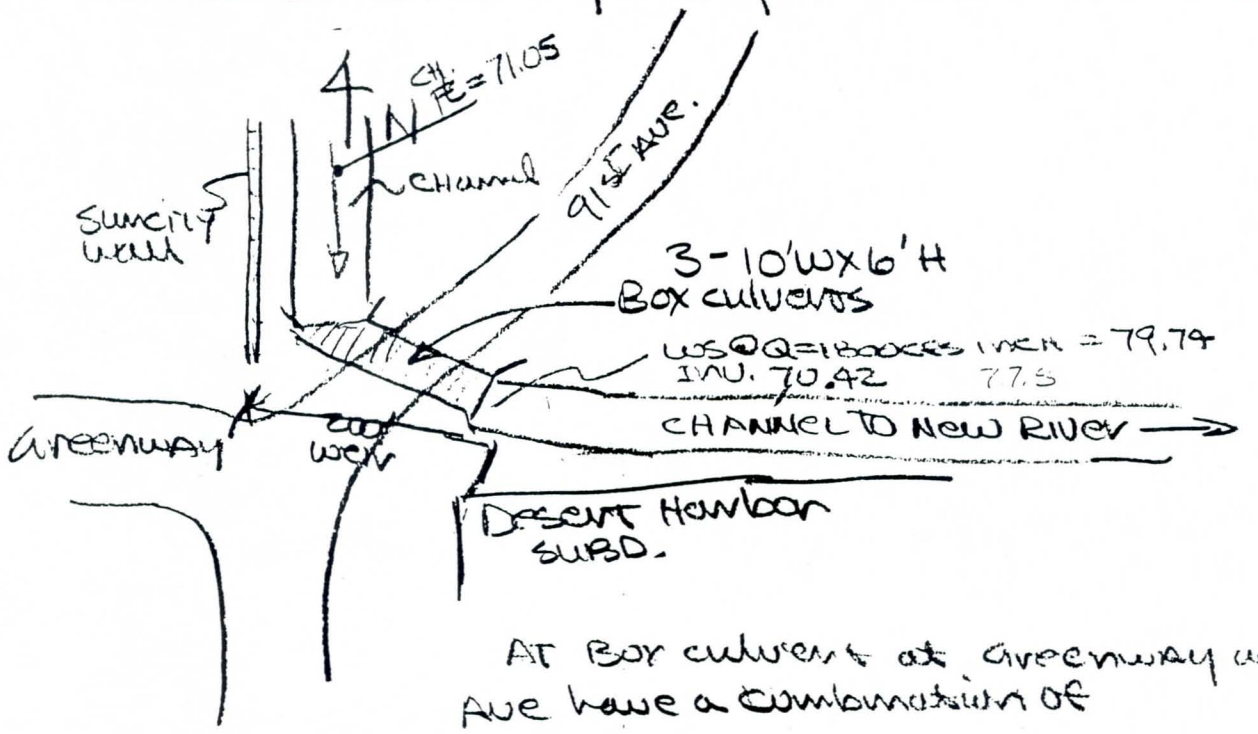
* From street ℄ invert

ERIE & ASSOCIATES, INC.
CONSULTING ENGINEERS

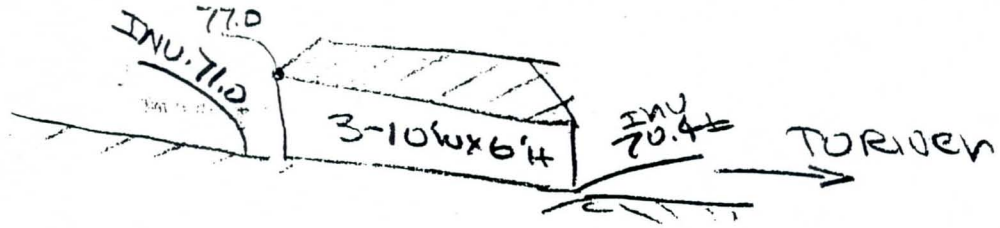
JOB NO. 14163 SHEET 6/6

PROJECT Torhjohn S/O Bell W/O 91st CALC. CE DATE JAN 94

SUBJECT 91st & Greenway rating curve CHKD. DATE



At Box culverts at Greenway w/ 91st Ave have a combination of

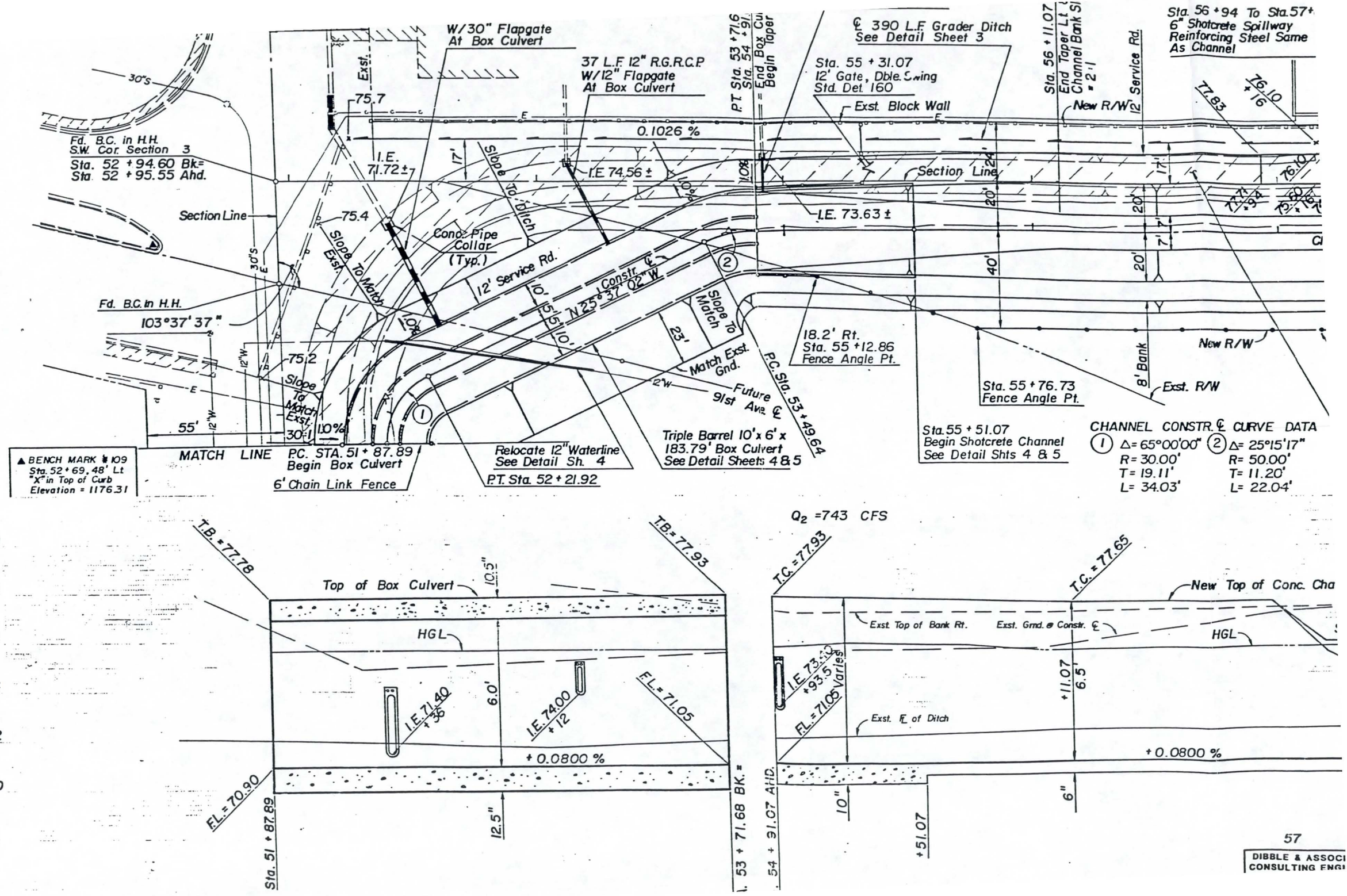


Assume box is in inlet control, Let weir length be 200' at elev 77.5 (top of box)

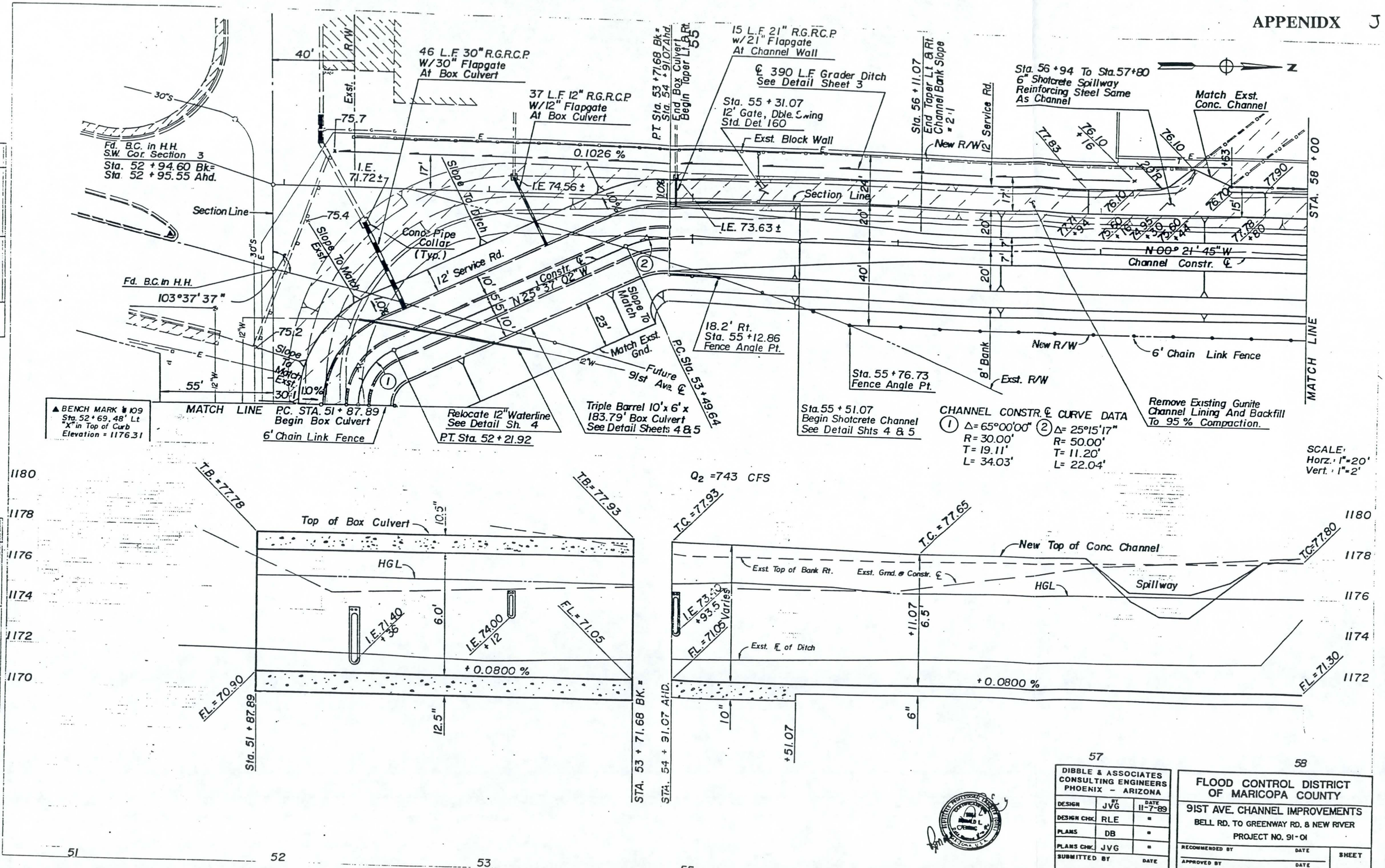
ELEV.	HW/D	Q/B	$Q_{@B=26'}$ Box*	H_{weir}	Q_{weir}	Q_{TOT}
71.0	0	0	0	0	0	0
77.0	1.0	45	1170.	0	0	1,170.
78.0	1.17	53.	1380.	1.0	520	1,900.
79.0	1.33	60.	1560.	2.0	1,470.	3,000.
80.0	1.5	78.	2030	3.0	2,700	4,700

where $Q_{weir} = CLH^{3/2}$; $C = 2.6$ & $L = 200'$.

*Assume 4' of debris on Box piers (1 pier width on each side of each pier.)



DIBBLE & ASSOCI
CONSULTING ENGI



DIBBLE & ASSOCIATES CONSULTING ENGINEERS PHOENIX – ARIZONA		
DESIGN	BY JVG	DATE 11-7-89
DESIGN CHK.	RLE	"
PLANS	DB	"
PLANS CHK.	JVG	"
SUBMITTED BY		DATE

FLOOD CONTROL DISTRICT OF MARICOPA COUNTY

91ST AVE. CHANNEL IMPROVEMENTS

BELL RD. TO GREENWAY RD. & NEW RIVER

PROJECT NO. 91-01

RECOMMENDED BY DATE

APPROVED BY DATE

CHIEF ENGINEER AND GENERAL MANAGER

SHEET 13 OF 21

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1**************************************
**************************************
*                                    *                                    *
*                                    *                                    *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)*                                    *   U.S. ARMY CORPS OF ENGINEERS
*                                    *                                    *
*            SEPTEMBER 1990          *                                    *   HYDROLOGIC ENGINEERING CENTER
*                                    *                                    *
*             VERSION 4.0            *                                    *         609 SECOND STREET
*                                    *                                    *
*                                    *                                    *       DAVIS, CALIFORNIA 95616
*                                    *                                    *
* RUN DATE  09/29/1994  TIME  11:46:29 *                                  *          (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

  1           ID   91ST AVENUE HYDROLOGY NORTH OF GREENWAY ROAD DATAFILE:91ST.DAT
  2           ID   FCD-WSMB HEC-1 MODEL DEVELOPMENT FOR EXISTING CONDITIONS
  3           ID   REVISION DATE: JUNE 20, 1994.  AA AND FT COMMENTS HAVE BEEN INCORPORATED.
  4           ID     *** THIS EXCLUDED A SUBDIVISION AREA THRU COUNTRY CLUB ROAD AND INCLUDED
  5           ID         POSSIBLE BLEED OFF THRU WBV WEST AS PER MEETING MAY 9, 1994
  6           ID         WITH DEVELOPMENT SERVICES DIVISION, CITY OF PEORIA
  7           ID   RUN WITH 350 AC-FT RETENTION IN WEST WESTBROOK VILLAGE AND ERIE'S DATA
  8           ID   BASIC ASSUMPTIONS AS PER MEETINGS WITH THE CITY OF PERORIA
  9           ID          :MAX. OF 137 CFS EASTWARD DIVERSION ALONG CALLE LEJOS AT CP-D2 TO 83RD
 10           ID          :DATA FROM PRELIM. DRAINAGE REPORT OF AM. ENGG. CO, DATED 12/1993
 11           ID          :AT 83RD & BEARDSLEY INTERSECTION, 30% GOES WEST AND 70% GO SOUTH
 12           ID          :AT INLET TO WEST WB NO EASTWARD DIVERSION OF 30% ALONG BEARDSLEY RD
 13           ID          :MAX. OF 100 CFS EASTWARD DIVESION ALONG UNION HILLS TO N.R.
 14           ID          :MAX. OF 150 CFS EASTWARD DIVERSION ALONG BELL RD TO N.R.
 15           ID          :NO INFLOW FROM SUN CITY AT EITHER BELL RD OR UNION HILLS RD
 16           ID          :SPILL THRU 91ST AVE SOUTH OF GREENWAY RO
 17           ID   MODELED AREA : CATCHMENT AREA NORTH OF GREENWAY RD = 9.80 SQ.MILES
 18           ID   RAINFALL     : 100YR-6HR = 3.20 INCHES
 19           ID   LOSS RATES   : GREEN AND AMPT BASED ON 5 DOMINANT SOIL MAPPING UNITS
 20           ID                 : LS RECORDS IN EAST WESTBROOK VILLAGE CONVERTED TO LG
 21           ID                 : AMC AT NORMAL CONDITION  W/ DTHETA= 0.10 TO .30
 22           ID                 : XKSAT CORRECTED FOR VEGETATION COVER
 23           ID   HYDROGRAPH    : CLARK UNIT HYDROGRAPH (MCUHP1)
 24           ID   ROUTING METH  : NORMAL DEPTH ROUTING PROCEDURE USING HYPOTHE. CHANNEL 700'
 25           ID                   WIDE WITH DEPTH UP TO 2 FT, S.S. 1:1, BOTTOM N=0.04
 26           ID   RETENTION     : MAXIMUM STORAGE OF 350 AC-FT IN WESTBROOK VILLAGE WEST
 27           ID                   AS ESTIMATED BY ERIE & ASSOC WAS USED INSTEAD OF 472 AC-FT
 28           ID                   AS REPORTED BY CONSULTANT IN UDC REPORT DATED 1983
 29           ID                   ALL RETENTION BASINS IN WESTBROOK VILLAGE EAST ARE USED
 30           ID                   AS PER DRAINAGE MASTER PLAN REVISED APRIL 1993 BY IMC
 31           ID                   CONSULTANTS LTD
 32           ID   SPLIT FLOWS   : RATING TABLES DEVELOPED BY ERIE & ASSOCIATES, INC. FOR
 33           ID                 : SOME STREET CROSSINGS WERE INCORPORATED INTO THE MODEL
 34           ID                 : ASSUMES INFLOW AT DIVERSION AS SUM OF TWO FLOWS PER RATING
 35           ID         DIVERSION AT WESTBROOK VILLAGE EAST SOUTH OUTLET INTERSECTION WITH
 36           ID         UNION HILLS ROAD SPLITS TO NEW RIVER, COUNTRY CLUB RD AND 91ST AVE
 37           ID         WEIR FLOW EXISTS OVER UNION HILLS CROWN SOUTH OF WESTBROOK VILLAGE EAST
 38           ID         SOUTHWARD OVERFLOW PRORATED AS PER CREST LENGTH WITH Q=CLH**1.5
 39           ID         WHERE C=2.6, L = CREST LENGTH, H = HEAD OVER ROAD CROWN
 40           ID         91ST FLOW SPLITS AT 87TH AVE AND 89TH AVE AND REMAINING FLOW TO 91ST AV
              *DIAGRAM
              *     FREQ      2YR     5YR    10YR    25YR    50YR   100YR
              * JR  PREC    0.375   0.531   0.634   0.778   0.891   1.000
 41           IT        5 20JUN94    1200     300
 42           IO        5

 43           KK   SB-A1
 44           BA    .117
 45           IN      15
 46           PB   3.027
 47           PC    .000    .013    .019    .028    .043    .055    .067    .079    .091    .103
 48           PC    .118    .133    .155    .201    .285    .464    .679    .811    .880    .921
 49           PC    .947    .961    .974    .987   1.000
 50           LG     .35     .25     4.2     .43       3
 51           UC    .483    .441
1                                          HEC-1 INPUT                                                    PAGE  2

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

 52           UA       0       3       5       8      12      20      43      75      90      96
 53           UA     100
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 54          KK    R-A1
 55          RS       2     FLOW      -1
 56          RC     .04      .03     .04     2800    .0064
 57          RX       0       25      50       80      120     150     175     200
 58          RY     102      101     100      100      100     100     101     102

 59          KK   SB-A2
 60          BA    .205
 61          LG     .35      .25     4.1      .44        5
 62          UC   1.125     .835
 63          UA       0        5      16       30       65      77      84      90      94      97
 64          UA     100

 65          KK    CPA2
 66          KM   AT INTERSECTION WITH PINNACLE PEAK RD
 67          HC       2

 68          KK    R-A2
 69          RS       3     FLOW      -1
 70          RC     .04      .03     .04     3600    .0072
 71          RX       0       25      50       80      120     150     175     200
 72          RY     102      101     100      100      100     100     101     102

 73          KK   SB-A3
 74          BA    .175
 75          LG     .35      .25     4.1      .44        2
 76          UC    .954     .820
 77          UA       0        3       5        8       12      20      43      75      90      96
 78          UA     100

 79          KK    CPA3
 80          KM   AT INTERSECTION WITH UNNAMED RD
 81          HC       2

 82          KK    R-A3
 83          RS       2     FLOW      -1
 84          RC     .04      .03     .04     2800    .0064
 85          RX       0       25      50       80      120     150     175     200
 86          RY     102      101     100      100      100     100     101     102

 87          KK   SB-A4
 88          BA    .145
 89          LG     .35      .25     3.9      .38        2
 90          UC    .742     .480
 91          UA       0        3       5        8       12      20      43      75      90      96
 92          UA     100
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 93          KK    CPA4
 94          KM   AT INTERSECTION WITH UNNAMED RD
 95          HC       2

 96          KK    R-A4
 97          RS       3     FLOW      -1
 98          RC     .04      .03     .04     3800    .0058
 99          RX       0       25      50       80      120     150     175     200
100          RY     102      101     100      100      100     100     101     102

101          KK   SB-A5
102          BA    .088
103          LG     .35      .25     3.9      .37        2
104          UC   1.008    1.289
105          UA       0        3       5        8       12      20      43      75      90      96
106          UA     100

107          KK    CPA5
108          KM   AT INTERSECTION WITH BEARDSLEY RD
109          HC       2

110          KK   SB-A6
111          BA    .086
112          LG     .35      .25     3.9      .37        2
113          UC    .546     .562
114          UA       0        3       5        8       12      20      43      75      90      96
115          UA     100

116          KK    R-A6
117          RS       1     FLOW      -1
118          RC     .04      .03     .04     2600    .0058
119          RX       0       25      50       80      120     150     175     200
120          RY     102      101     100      100      100     100     101     102

121          KK   SB-A7
122          BA    .083
123          LG     .35      .25     3.5      .29        2
124          UC    .688     .679
125          UA       0        3       5        8       12      20      43      75      90      96
126          UA     100

127          KK    CPA7
128          KM   BEARDSLEY RD. AT ABOUT 97TH AVE ALIGNMENT
129          HC       3

130          KK   SB-B1
131          BA    .087
132          LG     .35      .25     3.8      .29     1.00
133          UC    .254     .225
134          UA       0        3       5        8       12      20      43      75      90      96
135          UA     100
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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136          KK    R-B1
137          RS       1     FLOW      -1
138          RC     .03      .02     .03     2640    .0102
139          RX       0       10      20       30       40       50       60       70
140          RY     102      101     100      100      100      100      101      102

141          KK   SB-B2
142          KM   SUB-BASIN B2
143          BA    .160
144          LG     .35      .25     3.8      .29        3
145          UC    .317     .296
146          UA       0        3       5        8       12       20       43       75       90       96
147          UA     100

148          KK    CPB2
149          HC       2

150          KK    R-B2
151          RS       1     FLOW      -1
152          RC     .03      .02     .03     1760    .0250
153          RX       0       10      20       30       40       50       60       70
154          RY     102      101     100      100      100      100      101      102

155          KK   SB-B3
156          BA    .119
157          LG     .35      .25     3.9      .38       10
158          UC   1.096     .934
159          UA       0        3       5        8       12       20       43       75       90       96
160          UA     100

161          KK    CPB3
162          KM   AT INTERSECTION OF 93RD AVE & PINNACLE PEAK RD
163          HC       2

164          KK    R-B3
165          RS       3     FLOW      -1
166          RC     .03      .02     .03     5280    .0066
167          RX       0       25      50       80      120      150      175      200
168          RY     102      101     100      100      100      100      101      102

169          KK   SB-B4
170          BA     .32
171          LG     .35      .25     3.9      .38        2
172          UC   1.375    1.009
173          UA       0        3       5        8       12       20       43       75       90       96
174          UA     100

175          KK    CPB4
176          KM   AT DEER VALLEY RD
177          HC       2
1                                        HEC-1 INPUT                                                PAGE  5

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

178          KK    D-B4
179          KM   DIVERT 50% EAST TO 91ST AVENUE
180          DT     DB4
181          DI       1       10     100     1000    10000
182          DQ      .5        5      50      500     5000

183          KK    R-B4
184          KM   ROUTE REMAINING FLOW THRU SUB-B7
185          RS       2     FLOW      -1
186          RC     .04      .03     .04     5280    .0059
187          RX       0       25      50       80      120      150      175      200
188          RY     102      101     100      100      100      100      101      102

189          KK   SB-B5
190          BA    .114
191          LG     .35      .25     4.1      .46        2
192          UC   1.008    1.045
193          UA       0        3       5        8       12       20       43       75       90       96
194          UA     100

195          KK    R-B5
196          RS       1     FLOW      -1
197          RC     .04      .03     .04     2640    .0064
198          RX       0       25      50       80      120      150      175      200
199          RY     102      101     100      100      100      100      101      102

200          KK   SB-B6
201          BA   0.156
202          LG     .35      .25     3.9      .40        2
203          UC    .692     .407
204          UA       0        3       5        8       12       20       43       75       90       96
205          UA     100

206          KK    CPB6
207          KM   AT INTERSECTION WITH DEER VALLEY RD
208          HC       2

209          KK    R-B6
210          RS       2     FLOW      -1
211          RC     .04      .03     .04     5250    .0059
212          RX       0       25      50       80      120      150      175      200
213          RY     102      101     100      100      100      100      101      102

214          KK   SB-B7
215          BA     .67
216          LG     .35      .25     3.8      .35        2
217          UC    .144     .695
218          UA       0        3       5        8       12       20       43       75       90       96
219          UA     100
1                                        HEC-1 INPUT                                                PAGE  6

LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10
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220          KK    CPB7
221          KM   AT INLET TO WEST WESTBROOK VILLAGE WEST ALONG BEARDSLY RD
222          HC       4

223          KK   RWBW1
224          KM   ROUTE THRU WEST WESTBROOK VILLAGE GOLF COURSES
225          RS       3     FLOW      -1
226          RC     .03      .02      .03     5280    .0050
227          RX       0       30       60       90      190      300      330      360
228          RY     104      103      101      100      100      101      103      104

229          KK     WBW
230          KM   TOTAL OF PARCELS 1 TO 27 IN WESTBROOK VILLAGE WEST(1983 PROJECT)
231          KM   PLUS PARCELS 28 (GOLF COURSES) ABOUT 23% OF AREA
232          BA    1.00
233          LG     .35      .25      3.5      .28       30
234          UC    1.00      .85
235          UA       0        3        5        8       12       20       43       75       90       96
236          UA     100

237          KK    CWBW
238          HC       2

239          KK    RBWB
240          KM    PER 1983 UDC REPORT AVAILABLE STORAGE IS 472 AC-FT IN GOLF COURSES
241          KM    A MAXIMUM OF 350 AC-FT IS ASSUMED AS PER ERIE'S QUESTIMATE
242          KM    PER MEETING ON MAY 9, 1994 25 CFS IS ASSUMED AS BLEED OFF THRU 2'DIA PIPE
243          KM    CULVER CROSSING UNION HILLS ROAD AT ABOUT 93RD AVENUE ALIGNMENT
244          RS       1     STOR       0
245          SV       0       50      100      150      200      300      350      400      500
246          SE      26       27       28       29       30       32       34       36       38
247          SQ       0       25       25       25       25       25       25      300      400

248          KK   RRBOF
249          KM   ALONG UNIONB HILLS RD EASTWARD TOWARDS 93RD AVE
250          RS       1     FLOW      -1
251          RC     .03      .02      .03     2080    .0063
252          RX       0       20       40       60       80      100      120      140
253          RY     102      101      100      100      100      100      101      102

254          KK   SB-C1
255          BA    .100
256          KM   RAINFALL DEPTH OF 3.20 WAS SPACIALLY REDUCED TO FIND TC & R FOR THIS BASIN
257          KM   USED REDUCTION FACTOR OF 0.946
258          LG     .25      .25      4.1      .42        5
259          UC    .513     .406
260          UA       0        5       16       30       65       77       84       90       94       97
261          UA     100
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

262          KK    R-C1
263          KM   ROUTE A THRU 91ST AVE
264          RS       3     FLOW      -1
265          RC    0.03     0.02      .03     3280    .0091
266          RX       0        2       12       22       42       52       62       64
267          RY     102      100      100      100      100      100      100      102

268          KK   SB-C2
269          KM   SUB-BASIN C2
270          BA    .190
271          LG     .25      .25      3.5      .29       10
272          UC    .400     .238
273          UA       0        5       16       30       65       77       84       90       94       97
274          UA     100

275          KK    CPC2
276          KM   AT INTERSECTION OF 91ST AVE & PINNACLE PEAK RD
277          HC       2

278          KK    D-C2
279          KM   DIVERT 10% EASTWARD THRU PINNACLE PEAK
280          DT     DC2
281          DI       9       90      900     9000
282          DQ       3        9       90      900

283          KK    R-C2
284          KM   ROUTE C2 THRU 91ST AVE FROM WILLIAMS RD TO DEER VALLEY RD
285          RS       2     FLOW      -1
286          RC   0.025      .02     .025     2640    .0068
287          RX       0        2       12       22       42       52       62       64
288          RY     102      100      100      100      100      100      100      102

289          KK      C3
290          BA    0.04
291          LG     .25      .25      3.5      .29       20
292          UC    .338     .399
293          UA       0        5       16       30       65       77       84       90       96       97
294          UA     100

295          KK    CPC3
296          KM   AT INTERSECTION OF WILLIAMS RD CROSSING W/ 91ST AVE
297          HC       2

298          KK    R-C3
299          RS       2     FLOW      -1
300          RC    .025      .02     .025     2640    .0068
301          RX       0        2       12       22       42       52       62       64
302          RY     102      100      100      100      100      100      100      102
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

303          KK   SB-C4
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304          KM   SUB-BASIN C4
305          BA    .070
306          LG     .15      .25      3.5      .29       15
307          UC    .492     .546
308          UA       0        5       16       30       65      77       84       90       94       97
309          UA     100

310          KK   CPC4A
311          KM   AT INTERSECTION OF 91ST AV & DEER VALLEY RD
312          HC       2

313          KK     DB4
314          DR     DB4

315          KK    CPC4
316          KM    91ST AVENUE AT DEER VALLEY ROAD
317          HC       2

318          KK    R-C4
319          KM   ROUTE C4 THRU 91ST AVE
320          RS       4     FLOW       -1
321          RC    .025      .02     .025     5280    .0061
322          RX       0        2       12       22       42      52       62       64
323          RY     102      100      100      100      100     100      100      102

324          KK   SB-C5
325          KM   SUB-BASIN C5
326          BA    .120
327          LG     .25      .25      3.5      .29       30
328          UC    .563     .654
329          UA       0        5       16       30       65      77       84       90       94       97
330          UA     100

331          KK    CPC5
332          KM   AT INTERSECTION OF 91ST AVE & BEARDSLEY RD
333          HC       2

334          KK    D-C5
335          KM   DIVERT 30% OF THE FLOWS EAST TO WEST BROOK VILLAGE EAST DETENTION
336          DT     DC5
337          DI       0       50      100      200      300     400
338          DQ       0       15       30       60       90     120

339          KK  WB-P8B
340          KM   WESTBROOK VILLAGE PARCELL B8
341          KM   THIS PARCEL DISCHARGES DIRECTLY INTO 91ST AVENUE
342          BA   .0085
343          LG     .25      .25      3.5      .28       30
344          UC     .17      .15
345          UA       0        5       16       30       65      77       84       90       94       96
346          UA     100
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

347          KK    CP5B
348          KM   91ST AVE, SOUTH OF BEARDSLEY ROAD
349          HC       2

350          KK    R-5B
351          KM    ROUTE FLOWS ON 91ST AVENUE, BEARDSLEY TO UNION HILLS
352          KM   ROUTE THRU 91ST AVE SOUTHWARD, X-SECTION GIVEN IN 1983 WB REPORT
353          RS       1     FLOW       -1
354          RC    0.02     .015      .02     2380    .0045
355          RX       0       12       22       40       80     121      131      143
356          RY     103      100      100      102      102     100      100      103

357          KK     WB9
358          KM   COMBINE PARCELS 8A,10B,7,6,5,G10,2B,3B
359          BA   .2814
360          LG     .25      .25      3.5      .28       45
361          UC    .290     .250
362          UA       0        5       16       30       65      77       84       90       94       96
363          UA     100

364          KK   R-R10
365          KM   ROUTE FLOWS THROUGH RESERVOIR 10, WESTBROOK VILLAGE EAST
366          KM   THE RESERVOIR BLEEDS INTO 91ST AVENUE,
367          RS       1    STOR       -1        0
368          SV       0      .35     2.28      6.4    12.82    24.0
369          SE    27.5     28.5     29.5     30.5     31.5    32.5
370          SQ       0        2       12       19       22    44.0

371          KK    91ST
372          KM    91ST AVENUE AT INTERSECTION WITH UNION HILL DR
373          HC       2

374          KK   SB-D1
375          BA     .13
376          LG     .35      .25      4.3      .46        2
377          UC    .346     .232
378          UA       0        5       16       30       65      77       84       90       94       96
379          UA     100

380          KK    R-D1
381          RS       2     FLOW       -1
382          RC     .03      .02      .03     2640    .0223
383          RX       0       20       40       60       80     100      120      140
384          RY     103      102      101      100      100     101      102      103

385          KK   SB-D2
386          BA    .073
387          LG     .35      .25      4.3      .46        2
388          UC    .692     .874
389          UA       0        5       16       30       65      77       84       90       94       97
390          UA     100
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 391          KK   CPD2
 392          KM  AT INTERSECTION OF CALLEY LEJOS & 89TH AVE
 393          HC      2

 394          KK   DVD2
 395          KM   DIVERT MAX. OF 137 CFS AS PER AM. ENGINEERING CO. REPORT DEC. 1993
 396          DT    DD2
 397          DI      0      50     100     137     200     400
 398          DQ      0      50     100     137     137     137

 399          KK   R-D2
 400          RS      2    FLOW      -1
 401          RC    .04     .03     .04    2640   .0109
 402          RX      0       5      10      20      40      50      55      60
 403          RY    102     101     100     100     100     100     101     102

 404          KK  SB-D3
 405          BA   .114
 406          LG    .35     .25     3.5     .29      10
 407          UC   .571    .393
 408          UA      0       5      16      30      65      77      84      90      94      97
 409          UA    100

 410          KK   CPD3
 411          KM  AT INTERSECTION OF PINNACLE PEAK RD & 87TH AVE
 412          HC      2

 413          KK   R-D3
 414          RS      2    FLOW      -1
 415          RC    .03     .02     .03    2640   .0076
 416          RX      0       5      10      20      40      50      55      60
 417          RY    102     101     100     100     100     100     101     102

 418          KK  SB-D4
 419          BA    .12
 420          LG    .35     .25     3.5     .29      15
 421          UC   .583    .391
 422          UA      0       5      18      30      65      77      84      90      94      97
 423          UA    100

 424          KK   CPD4
 425          KM  AT INTERSECTION OF WILLIAMS RD & 87TH AVE
 426          HC      2

 427          KK   R-D4
 428          RS      1    FLOW      -1
 429          RC    .03     .02     .03    1400    .001
 430          RX      0       5      10      20      40      50      55      60
 431          RY    103     102     101     100     100     101     102     103
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 432          KK  SB-D5
 433          BA   .188
 434          LG    .35     .15     8.5     .06      15
 435          UC    .50     .40
 436          UA      0       3       5       8      12      20      43      75      90      96
 437          UA    100

 438          KK   CPD5
 439          KM  AT INTERSECTION OF DEER VALLEY RD & 87TH AVE
 440          HC      2

 441          KK   R-D5
 442          RS      2    FLOW      -1
 443          RC    .03     .02     .03    2640   .0048
 444          RX      0      25      50      80     120     150     175     200
 445          RY    102     101     100     100     100     100     101     102

 446          KK  SB-D6
 447          BA   .145
 448          LG    .35     .15     9.4     .02       2
 449          UC   .500    .400
 450          UA      0       3       5       8      12      20      43      75      90      96
 451          UA    100

 452          KK   CPD6
 453          KM  AT NR INTERSECTION OF 89TH RD & UNNAMED RD
 454          HC      2

 455          KK   R-D6
 456          KM  ROUTE WESTWARD TO D12
 457          RS      1    FLOW      -1
 458          RC    .03     .02     .03    2640   .0045
 459          RX      0      25      50      80     120     150     175     200
 460          RY    102     101     100     100     100     100     101     102

 461          KK  SB-D7
 462          KM  SUB-BASIN D7
 463          BA   .150
 464          LG    .25     .25     4.1     .42       5
 465          UC   .296    .227
 466          UA      0       3       5       8      12      20      43      75      90      96
 467          UA    100

 468          KK   R-D7
 469          KM  ROUTE THRU 89TH AVE
 470          RS      3    FLOW      -1
 471          RC    .03     .02     .03    2640   .0083
 472          RX      0       3       6      16      26      37      47      50
 473          RY    103     100     100     100     100     100     100     103
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 474          KK  SB-D93
 475          BA     .15
 476          LG     .25      .25     3.50     0.29     15.0
 477          UC   0.379    0.260
 478          UA       0        5       16       30       65       77       84       90       94       97
 479          UA     100

 480          KK    CPD9
 481          HC       2

 482          KK    D93E
 483          KM   DIVERT 30% EASTWARD ALONG PINNACLE PEAK TO D10
 484          DT    D93E
 485          DI       0      100     1000
 486          DQ       0       30      300

 487          KK    RD93
 488          RS       1     FLOW       -1
 489          RC     .03      .02      .03     2640    .0083
 490          RX       0        3        6       16       26       37       47       50
 491          RY     103      100      100      100      100      100      100      103

 492          KK     DC2
 493          KM   RETRIEVE DIVERTED 10%
 494          DR     DC2

 495          KK   SB-D9
 496          KM   SUB-BASIN D9
 497          BA    .310
 498          LG     .25      .25      3.5      .29       15
 499          UC    .546     .426
 500          UA       0        5       16       30       65       77       84       90       94       97
 501          UA     100

 502          KK   RD93E
 503          DR    D93E

 504          KK  SB-D10
 505          KM   SUB-BASIN D-10
 506          BA    .080
 507          LG     .15      .25      3.5      .25       15
 508          UC    .433     .474
 509          UA       0        5       16       30       65       77       84       90       94       97
 510          UA     100

 511          KK   CPD10
 512          KM   AT INTERSECTION OF 89TH AVE AND WILLIAMS RD
 513          KM   SERIOUS FLOODING HAVE BEEN OBSERVED AT THIS POINT
 514          HC       5
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 515          KK   R-D10
 516          KM   ROUTE THRU 89TH AVE TO DEER VALLEY RD
 517          RS       2     FLOW       -1
 518          RC    .025      .02     .025     2640    .0061
 519          RX       0        3        6       16       27       37       47       50
 520          RY     103      100      100      100      100      100      100      103

 521          KK  SB-D11
 522          KM   SUB-BASIN D11
 523          BA    .080
 524          LG     .15      .25      3.5      .25       15
 525          UC    .467     .451
 526          UA       0        5       16       30       65       77       84       90       94       97
 527          UA     100

 528          KK   CPD11
 529          KM   AT INTERSECTION OF DEER VALLEY RD & 89TH AVE
 530          HC       2

 531          KK   R-D11
 532          KM   ROUTE THRU POORLY DEFINED NATURAL DEPRESSIONS?
 533          RS       1     FLOW       -1
 534          RC     .04      .03      .04     5600    .0054
 535          RX       0       20       50       80      120      150      180      200
 536          RY     102      101      100      100      100      100      101      102

 537          KK  SB-D12
 538          KM   SUB-BASIN D12
 539          BA    .180
 540          LG     .20      .25      3.5      .30        2
 541          UC    .917    1.033
 542          UA       0        3        5        8       12       20       43       75       90       96
 543          UA     100

 544          KK     DC5
 545          DR     DC5

 546          KK    WBE1
 547          KM   COMBINE FLOWS FROM SUB-B 9,10,11,12 AND ROUTED FLOWS
 548          KM   ABOUT 1280 FT ALONG BEARDSLEY RD EAST OF 91ST AVENUE
 549          KM   NOTE***AS PER WESTBROOK DRAINAGE MASTER PLAN CAHNNEL CAPACITY = 500CFS
 550          HC       4

 551          KK  R-WBE1
 552          KM   ROUTE OFFSITE INFLOWS, W.B. EAST INLET TO FIRST DETENTION
 553          RS       1     FLOW       -1
 554          RC     .03      .02      .03      260   .00192
 555          RX       0       12     17.5     22.5     33.5     37.5       43       55
 556          RY      45       42       40       40       40       40       42       45
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 557          KK     WB1
 558          KM   COMBINE PARCELS 9,10A,11,12,GC3
 559          KM   HIGHEST SCS LAG TIME USED BY CONSULTANT WAS CONVERTED TO TC: TLAG/0.60
 560          BA   0.123
 561          LG     .35      .25      8.4      .06       35
 562          UC   0.333     .250
 563          UA       0        3        5        8       12       20       43       75       90       96
 564          UA     100

 565          KK   CPWB1
 566          KM   WITHIN EAST WESTBROOK VILLAGE
 567          HC       2

 568          KK    R-R3
 569          KM   ROUTE THROUGH RESERVOIR 3 IN WESTBROOK VILLAGE EAST
 570          RS       1     STOR       -1        0
 571          SV       0      .19     1.23     3.71     7.87     12.1     24.0
 572          SE      32       33       34       35       36       37     38.0
 573          SQ       0        2       12       19      195      811   1200.0

 574          KK     WB2
 575          KM   COMBINE PARCELS 19,18B,GC4-5
 576          BA   0.101
 577          LG     .35      .15      8.4      .06       45
 578          UC   0.680     .500
 579          UA       0        3        5        8       12       20       43       75       90       96
 580          UA     100

 581          KK   CPWB2
 582          KM   WITHIN EAST WESTBROOK VILLAGE
 583          HC       2

 584          KK   R-4-5
 585          KM   ROUTE THROUGH RESERVOIRS 4 AND 5 IN WESTBROOK VILLAGE EAST
 586          RS       1     STOR       -1        0
 587          SV       0     2.57     7.19    13.71     22.4       32       37       42       47       52
 588          SE      27       28       29       30       31       33       34       35       36       37
 589          SQ       0        2       12       19       21       21       21       21      386     1207

 590          KK     WB3
 591          KM   GOLF COURSE AT DRIVING RANGE
 592          BA   .0126
 593          LG     .35      .25      3.5      .29       45
 594          UC    .177     .150
 595          UA       0        3        5        8       12       20       43       75       90       96
 596          UA     100

 597          KK   CPWB3
 598          KM   WITHIN EAST WESTBROOK VILLAGE
 599          HC       2
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 600          KK     R-6
 601          KM     RESERVOIR 6 WESTBROOK VILLAGE EAST
 602          RS       1     STOR       -1        0
 603          SV       0        2        4        6        8
 604          SE      33       34       35       36       37
 605          SQ       0        0      227      811     1200

 606          KK   SB-F1
 607          BA    .114
 608          LG     .35      .25      4.0      .40        0
 609          UC    .383     .342
 610          UA       0        3        5       88       12       20       43       75       90       96
 611          UA     100

 612          KK    QINP
 613          BA    0.17
              * BI  CED2       21
              * THIS IS AN INPUT HYDROGRAPH OF CED2 EDITED FOR MAXIMUM Q OF 137 CFS
 614          IN       5             1540
 615          QI       0        2       23       51       88      124      155      176      168
 616          QI     133      112       93       76       63       53       43       36       30
 617          QI      23       19       16       14       12       10        8        7        6
 618          QI       4        3        2        1        0        0        0        0        0

 619          KK    CIQF
 620          HC       2

 621          KK   RCIQF
 622          RS       1     FLOW       -1
 623          RC     .03      .02      .03     2640     .008
 624          RX       0        5       10       20       40       50       55       60
 625          RY     102      101      100      100      100      100      101      102

 626          KK   SB-F2
 627          BA    .102
 628          IN      15
 629          LG     .35      .25      3.5      .29        2
 630          UC    .663     .518
 631          UA       0        5       16       30       65       77       84       90       94       97
 632          UA     100

 633          KK    CPF2
 634          KM   AT INTERSECTION OF PINNACLE PEAK RD & 83RD AVE
 635          HC       2

 636          KK    R-F2
 637          RS       2     FLOW       -1
 638          RC     .03      .02      .03     2640   .0061
 639          RX       0        5       10       20       40       50       55       60
 640          RY     102      101      100      100      100      100      101      102
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 641          KK   SB-F3
 642          BA    .181
 643          LG     .35      .10     12.4      .01       10
 644          UC    .779     .595
 645          UA       0        5       16       30       65       77       84       90       94       97
 646          UA     100

 647          KK    CPF3
 648          KM   AT INTERSECTION OF WILLIAMS RD & 83RD AVE
 649          HC       2

 650          KK    R-F3
 651          RS       1     FLOW       -1
 652          RC     .03      .02      .03     2640    .0053
 653          RX       0        5       10       20       40       50       55       60
 654          RY     102      101      100      100      100      100      101      102

 655          KK   SB-F4
 656          BA    .136
 657          LG     .35      .15      8.4      .06       20
 658          UC    .500     .400
 659          UA       0        3        5        8       12       20       43       75       90       96
 660          UA     100

 661          KK    CPF4
 662          KM   AT INTERSECTION OF DEER VALLEY RD & 83RD AVE
 663          HC       2

 664          KK    R-F4
 665          RS       2     FLOW       -1
 666          RC     .03      .02      .03     2640   .00492
 667          RX       0        5       10       20       40       50       55       60
 668          RY     103      102      100      100      100      100      102      103

 669          KK   SB-F5
 670          BA    .059
 671          LG     .35      .30      6.6      .17        5
 672          UC    .500     .518
 673          UA       0        3        5        8       12       20       43       75       90       96
 674          UA     100

 675          KK    CPF5
 676          KM   AT INTERSECTION OF UNNAMED RD & 83RD AVE
 677          HC       2

 678          KK   SB-E1
 679          BA    .097
 680          LG     .35      .25      4.2      .43        2
 681          UC    .463     .416
 682          UA       0        3        5        8       12       20       43       75       90       96
 683          UA     100
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LINE          ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

 684          KK     RD2
 685          KM   RETRIEVE DIVERTED DD2
 686          DR     DD2

 687          KK    CED2
 688          KO       5        0        0        0       21
 689          HC       2

 690          KK    DCLE
 691          KM   DIVERT UP TO MAXIMUM OF 137 EASTWARD ALONG CALLE LEJOS
 692          DT    DVCL
 693          DI       0      100      137      200      400
 694          DQ       0      100      137      137      137

 695          KK     RED
 696          RS       2     FLOW       -1
 697          RC     .04      .03      .04     2800   .00857
 698          RX       0       25       50       80      120      150      175      200
 699          RY     102      101      100      100      100      100      101      102

 700          KK   SB-E2
 701          BA    .153
 702          LG     .35      .25      3.5      .29        2
 703          UC    .733     .515
 704          UA       0        3        5        8       12       20       43       75       90       96
 705          UA     100

 706          KK    CPE2
 707          KM   AT INTERSECTION OF PINNACLE PEAK & 85TH AVE
 708          HC       2

 709          KK    R-E2
 710          RS       2     FLOW       -1
 711          RC     .04      .03      .04     2640    .0068
 712          RX       0       25       50       80      120      150      175      200
 713          RY     102      101      100      100      100      100      101      102

 714          KK   SB-E3
 715          BA    .143
 716          LG     .35      .30      6.6      .17       15
 717          UC    .563     .340
 718          UA       0        5       16       30       65       77       84       90       94       97
 719          UA     100

 720          KK    CPE3
 721          KM   AT INTERSECTION OF WILLIAMS RD & 85TH AVE
 722          HC       2
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723          KK    R-E3
724          RS       1    FLOW      -1
725          RC     .03     .02     .03    2640   .0052
726          RX       0       5      10      20      40      50      55      60
727          RY     102     101     100     100     100     100     101     102
1                                          HEC-1 INPUT                                                          PAGE 18

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

728          KK   SB-E4
729          BA    .100
730          LG     .35     .15    12.4     .01      15
731          UC    .500    .400
732          UA       0       3       5       8      12      20      43      75      90      96
733          UA     100

734          KK    CPE4
735          KM   AT INTERSECTION OF DEER VALLEY RD & 85TH AVE
736          HC       2

737          KK    R-E4
738          RS       2    FLOW      -1
739          RC     .04     .03     .04    2640   .0049
740          RX       0      25      50      80     120     150     175     200
741          RY     102     101     100     100     100     100     101     102

742          KK   SB-E5
743          BA    .107
744          LG     .35     .15    10.0     .03       2
745          UC    .500    .400
746          UA       0       3       5       8      12      20      43      75      90      96
747          UA     100

748          KK    CPE5
749          KM   AT INTERSECTION OF UNNAMED RD & 85TH AVE
750          HC       2

751          KK    R-E5
752          RS       1    FLOW      -1
753          RC     .04     .03     .04    2640   .0057
754          RX       0      25      50      50      80     120     175     200
755          RY     102     101     100     100     100     100     101     102

756          KK    CPF5
757          KM   83RD AVE 1/2 MILE NORTH OF BEARDSLEY (NORTH OF THE CITRUS FARM)
758          HC       2

759          KK    R-F5
760          RS       1    FLOW      -1
761          RC     .04     .03     .04    2640  .00492
762          RX       0      20      40      60      80     100     120     140
763          RY     103     102     101     100     100     101     102     103

764          KK   SB-F6
765          BA    .032
766          LG     .35     .10    12.4     .01      10
767          UC    .400    .300
768          UA       0       3       5       8      12      20      43      75      90      96
769          UA     100
1                                          HEC-1 INPUT                                                          PAGE 19

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

770          KK    CPF6
771          KM   83RD AVE. AND BEARDSLEY RD
772          HC       2

773          KK    DVER
774          KM    DIVERT 70% SOUTHWARD THRU 83RD AVENUE
775          DT    DV83
776          DI       0     200     400     800    1200
777          DQ       0     140     280     560     840

778          KK    R-F6
779          KM   ROUTE WESTWARD THRU BEARDSLEY RD TO WESTBROOK VILLAGE EAST
780          RS       1    FLOW      -1
781          RC     .03     .02     .03    1720  .00197
782          RX       0      20      40      60      80     100     120     140
783          RY     103     102     101     100     100     101     102     103

784          KK   SB-F7
785          BA    .360
786          LG     .35     .15     8.0     .04       5
787          UC    .500    .400
788          UA       0       3       5       8      12      20      43      75      90      96
789          UA     100

790          KK    WBE2
791          KM   WESTBROOK VILLAGE EAST, OFFSITE, EAST INFLOW CHANNEL, INCLUDES CITRUS FARM
792          HC       2

793          KK     WB4
794          KM   COMBINE PARCELS 13,14,G1
795          BA   .0644
796          LG     .35     .25     3.5     .29      45
797          UC   0.241    .200
798          UA       0       3       5       8      12      20      43      75      90      96
799          UA     100

800          KK   CPWB4
801          KM   WITHIN EAST WESTBROOK VILLAGE
802          HC       2

803          KK    R-R1
804          KM     ROUTE THROUGH RESERVOIR 1, WESTBROOK VILLAGE EAST
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805          RS       1    STOR      -1       0
806          SV       0   .1138   .6342  1.4316     3.3     5.5    6.46    6.94     7.5    10.5
807          SE      36      37      38      39      40      41      42      43      44    45.5
808          SQ       0       2      12      19    21.8    23.1    24.1      25     750    1350

809          KK     WB5
810          KM   COMBINE PARCELS 15,16,17, 18A,23A,GC2
811          BA    .079
812          LG     .35     .25     3.5     .29      45
813          UC    .285    .250
814          UA       0       3       5       8      12      20      43      75      90      96
815          UA     100
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

816          KK   CPWB5
817          KM   WITHIN EAST WESTBROOK
818          HC       2

819          KK    R-R2
820          KM   ROUTE THROUGH RESERVOIR 2, WESTBROOK VILLAGE EAST
821          RS       1    STOR      -1       0
822          SV       0    1.97    4.86    9.02   14.99      20      25      30      34      38
823          SE      26      27      28      29      30      31      32      33      34      35
824          SQ       0       2      12      19      21      21      21      21     930    1200

825          KK    CPR6
826          KM   COMBINE R6 AND R-R2
827          HC       2

828          KK   RCR26
829          RS       1    FLOW      -1
830          RC     .04     .03     .04    1420   .0018
831          RX       0      30      60      90     120     150     180     210
832          RY     104     102     100     100     100     100     102     104

833          KK     WB7
834          KM   COMBINE PARCELS 23B,21A,G7
835          BA    .033
836          LG     .35     .15     8.4     .06      60
837          UC    .218    .150
838          UA       0       3       5       8      12      20      43      75      90      96
839          UA     100

840          KK   CR6W7
841          HC       2

842          KK    R-R7
843          KM    ROUTE FLOWS THROUGH RESERVOIR 7, WESTBROOK VILLAGE EAST
844          RS       1    STOR      -1       0
845          SV       0     .15     .85    2.26    4.71     6.0     7.0     9.0
846          SE      27      28      29      30      31      32      33      34
847          SQ       0      11      23      35      46     526    1391    2500

848          KK     WB6
849          KM   COMBINE PARCELS 25,24,GC8,27A,26A
850          BA   .0839
851          LG     .35     .15     8.4     .06      45
852          UC   0.433    .300
853          UA       0       3       5       8      12      20      43      75      90      96
854          UA     100

855          KK    R-R8
856          KM    ROUTE FLOWS THROUGH RESERVOIR 8, WESTBROOK VILLAGE EAST
857          RS       1    STOR      -1       0
858          SV       0     .36    2.13    5.54   10.63   15.29    16.0
859          SE      27      28      29      30      31      32      33
860          SQ       0       2      12      19      22      30     100
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LINE         ID.......1.......2.......3.......4.......5.......6.......7.......8.......9......10

861          KK    C7R8
862          KM   COMBINE OUTFLOW FROM RES. 7 AND 8
863          HC       2

864          KK    RC78
865          KM   THRU MAIN SOUTH STREET W/IN EAST WESTBROOK
866          RS       1    FLOW      -1
867          RC     .03     .02     .03    1120   .0032
868          RX       0      15      30      60      80     105     120     135
869          RY     104     102     100     100     100     100     102     104

870          KK     WB8
871          KM   COMBINE R/C,1B,26B
872          BA   .0342
873          LG     .35     .15     8.4     .06      60
874          UC   0.167    .150
875          UA       0       3       5       8      12      20      43      75      90      96
876          UA     100

877          KK  CP-678
878          HC       2

879          KK    WB10
880          KM   COMBINE PARCELS1A,20,21B,G9A,G9B,2A,3A
881          BA   .0572
882          LG     .35     .25     5.0     .28      45
883          UC    .272    .200
884          UA       0       3       5       8      12      20      43      75      90      96
885          UA     100

886          KK    R-R9
887          KM   ROUTE THROUGH RESERVOIR 9, WESTBROOK VILLAGE EAST
888          RS       1    STOR      -1       0
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889          SV       0      .03     .376    1.698    4.517    9.114   12.000
890          SE      25       26       27       28       29       30       31
891          SQ       0        2       11       18       24      128      200

892          KK   WBEOT
893          KM    OUTFLOW FROM WESTBROOK VILLAGE EAST INTO UNION HILLS AT 86TH AVE ALIGNMENT
894          KM    AT INTERSECTION OF OUTLET WITH UNION HILLS RD, MAIN ENTERANCE
895          HC       2

896          KK    DVNR
897          KM   DIVERT 100CFS TO NEW RIVER: 50 CFS THRU 42"CMP AND 50 CFS OVERLAND
898          DT    TONR
899          DI       0       50      100      150      300      600      900
900          DQ       0        0        0      100      100      100      100

901          KK   CCLUB
902          KM   DIVERT THRU COUNTRY CLUB ROAD AND EVENTUALLY LOSS TO NEW RIVER
903          KM   RATING AS PER ERIE'S REPORT, ASSUMES OVERFLOW PROPORTIONAL TO WEIR LENGTH
904          DT   DCLUB
905          DI       0       50       80      982     2670     7461    13454
906          DQ       0        0        0      214      607     1716     3152
1                                          HEC-1 INPUT                                          PAGE 22

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

907          KK   RR287
908          KM   ROUTE REMAINING TO INTERSECTION OF UNION HILLS & 87TH AVE
909          RS       1     FLOW       -1
910          RC     .02    0.015      .02      660    .0015
911          RX       0        1        5       35       40       70       74       75
912          RY     104      102      100      101      101      100      102      104

913          KK   DV87S
914          KM   DIVERT SOUTH THRU 87TH AVE, PART  GO TO 91ST AVENUE AT UNION HILLS
915          KM   USING RATING CURVE DEVELOPED BY ERIE & ASSOCIATES
916          KM   INFLOW IS ASSUMED SUM OF RATED Q AT RD INTERSECTION
917          KM   THIS APPLIES TO SUCCEDING DIVERSIONS USING ERIE'S DATA
918          DT   DV87S
919          DI       0       50       80      762     2067     5745
920          DQ       0        0        0      221      625     1768

921          KK   RR289
922          KM   ROUTE REMAINING FLOW TO 89TH AVE THRU NORTH SIDE OF UNION HILLS RD.
923          RS       1     FLOW       -1
924          RC   0.015    0.015    0.015     1320    .0037
925          RX       0        1        5       35       40       70       74       75
926          RY     104      102      100      101      101      100      102      104

927          KK    DS89
928          KM   ASSUME SPLIT OCCURS WHEN DEPTH IS 0.5 FT ABOVE 91ST AVE CROWN AT INTERSECTION
929          KM   PER ERIE'S RATING Q=145 CFS ABOVE WHICH FLOW WILL HAVE 50-50 SPLIT
930          KM   FLOW LESS OR EQ TO 145 CFS WILL SIMPLY CONTINUE WESTWARD TO 91ST AVENUE
931          DT    DV89
932          DI       0       80      145      300      500      800     1200
933          DQ       0        0        0      150      250      400      600

934          KK   RR291
935          RS       1     FLOW       -1
936          RC     .02     .015      .02     1320    .0015
937          RX       0        1        5       35       40       70       74       75
938          RY     104      102      100      101      101      100      102      104

939          KK    CP91
940          KM    UNION HILLS AT 91ST AVENUE
941          HC       2

942          KK    DV91
943          KM   DIVERT SOUTH THRU 91ST AVE,THEN WEST TO 93RD AVENUE USING ERIE RATING VALUES
944          DT    DV91
945          DI       0      158      650     2890     6110
946          DQ       0      115      480     2180     4480

947          KK   RDV91
948          RS       1     FLOW       -1
949          RC     .02     .015      .02     1280    .0018
950          RX       0        1        5       35       40       70       74       75
951          RY     104      102      100      101      101      100      102      104
1                                          HEC-1 INPUT                                          PAGE 23

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

952          KK    CP93
953          KM      93RD AVENUE AT UNION HILLS,
954          HC       2

955          KK   R93RD
956          KM    ROUTE THRU PROPOSED CHANNEL ALONG EAST BOUNDARY OF SCITY
957          RS       1     FLOW       -1
958          RC     .02     .015      .02      360    .0037
959          RX       0        5       10       20       40       50       55       60
960          RY     105      103      100      100      100      100      103      105

961          KK   SB-G6
962          BA    .032
963          LG     .20      .30     6.80      .16     5.00
964          UC    .379     .315
965          UA       0        5       16       30       65       77       84       90       94       97
966          UA     100

967          KK    CPG6
968          HC       2

969          KK   R93G6
970          RS       1     FLOW       -1
971          RC     .03      .02      .03    640.0    .0001
972          RX       0       10       20       30       40       50       60       70
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 973          RY    104     102     101     100     100     101     102     104

 974          KK   R91S
 975          DR   DV91

 976          KK   RDV91
 977          RS      1    FLOW      -1
 978          RC    .02    .015     .02     360   .0133
 979          RX      0       1       5      35      40      70      74      75
 980          RY    104     102     100     102     102     100     102     104

 981          KK   CRG6C
 982          HC      2

 983          KK  RCG691
 984          RS      1    FLOW      -1
 985          RC    .03     .02     .03    2320   .0091
 986          RX      0       1       5      35      40      70      74      75
 987          RY    104     102     100     102     102     100     102     104

 988          KK   DV87S
 989          KM   RETREIVE FLOWS GOING SOUTH ON 87TH AVE SOUTH OF UNION HILLS
 990          DR   DV87S
```



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

 991          KK  RDV87S
 992          KM   ROUTE SOUTHWARD THRU 87TH AVE
 993          RS      1    FLOW      -1
 994          RC    .02   0.015     .02    1160   .0051
 995          RX      0       1       5      35      40      70      74      75
 996          RY    104     102     100     101     101     100     102     104

 997          KK   SB-G1
 998          BA    .034
 999          LG    .20     .15     8.4     .06      40
1000          UC    .229    .153
1001          UA      0       5      16      30      65      77      84      90      94      97
1002          UA    100

1003          KK    CPG1
1004          KM   AT INTERSECTION 87TH AVE & JOHN CABOT RD
1005          HC      2

1006          KK    R-G1
1007          RS      1    FLOW      -1
1008          RC    .02    .015    0.02    4400   .0039
1009          RX      0       1       5      35      40      70      74      75
1010          RY    104     102     100     101     101     100     102     104

1011          KK   SB-G2
1012          BA    .064
1013          LG    .20     .15     8.4     .06      30
1014          UC    .392    .307
1015          UA      0       5      16      30      65      77      84      90      94      97
1016          UA    100

1017          KK    CPG2
1018          KM   AT INTERSECTION OF BELL RD & 87TH AVE
1019          HC      2

1020          KK   BEL87
1021          KM   DIVERT 50% UP TO MAXIMUM OF 150 CFS EASTWARD ALONG BELL RD TO NR
1022          DT   BD2NR
1023          DI      0      20      50     150     200     300
1024          DQ      0       6      50     150     150     150

1025          KK    BDVW
1026          KM   DIVERT SOUTHWARD ALONG 87TH AVE, SOUTH OF BELL USING ERIE'S RATING VALUES
1027          DT    DVG2
1028          DI      0     101     600    2410    4905
1029          DQ      0      80     310    1540    3050

1030          KK   RCBG2
1031          KM   ROUTE WESTWARD ALONG BELL RD
1032          RS      1    FLOW      -1
1033          RC    .02   0.015     .02    1320   .0015
1034          RX      0       1       5      45      50      90      94      95
1035          RY    104     102     100     101     101     100     102     104
```



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

1036          KK   RDV89
1037          DR    DV89

1038          KK   RDV89
1039          RS      1    FLOW      -1
1040          RC    .02    .015     .02    5280   .0049
1041          RX      0       1       5      35      40      70      74      75
1042          RY    104     102     100     101     101     100     102     104

1043          KK   SB-G3
1044          BA    .260
1045          LG    .20     .25    3.80     .26      35
1046          UC    .708    .618
1047          UA      0       3       5       8      12      20      43      75      90      96
1048          UA    100

1049          KK   CP-G3
1050          KM   AT INTERSECTION OF BELL RD & 89TH AVE
1051          HC      3

1052          KK    RBG3
1053          RS      1    FLOW      -1
```

```
1054          RC     .02    .015     .02     680   .0015
1055          RX       0       1       5      35      40      70      74      75
1056          RY     104     102     100     101     101     100     102     104

1057          KK    SB-G4
1058          BA     .234
1059          LG      .20     .25     5.5     .19      15
1060          UC     .721    .589
1061          UA       0       5      16      30      65      77      84      90      94      96
1062          UA     100

1063          KK     CPG4
1064          KM    AT INTERSECTION BELL RD & 91ST AVE
1065          HC       3

1066          KK    DV2CP
1067          KM    DIVERT THRU 91ST AVE, SOUTH OF BELL USING ERIE'S DATA
1068          DT     DVG4
1069          DI       0      61    1020    2745    5635
1070          DQ       0      40     730    1875    3700

1071          KK     RWG4
1072          KM     ROUTE FLOWS WEST, NORTH OF BELL TO 91ST AVENUE DRAIN
1073          RS       1    FLOW      -1
1074          RC     .02    .015     .02     680   .0047
1075          RX       0       1       5      35      40      70      74      75
1076          RY     104     102     100     101     101     100     102     104
```



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

1077          KK    SB-G5
1078          BA     .196
1079          LG      .20     .30     6.8     .16      15
1080          UC     .625    .497
1081          UA       0       5      16      30      77      84      90      94      97
1082          UA     100

1083          KK     CPG5
1084          HC       2

1085          KK     RCG5
1086          KM     ROUTE FLOWS IN EXISTING DRAIN SOUTH OF BELL
1087          RS       1    FLOW      -1
1088          RC     .03     .02     .03    1250   .0042
1089          RX       0       6      12      24      36      48      60      72
1090          RY     108     104     102     100     100     102     104     108

1091          KK    RDVG4
1092          DR     DVG4

1093          KK     RDG4
1094          RS       1    FLOW      -1
1095          RC     .02    .015     .02     440   .0050
1096          RX       0       1       5      35      40      70      75      75
1097          RY     103     102     100      99      99     100     102     104

1098          KK    SB-H2
1099          BA     .064
1100          LG      .20     .25     6.3     .19       5
1101          UC     .504    .382
1102          UA       0       5      16      30      65      77      84      90      94      97
1103          UA     100

1104          KK     CPH2
1105          KM    ABOUT 440' S. OF BELL RD X 91ST INTERESECTION
1106          HC       2

1107          KK     R-H2
1108          RS       1    FLOW      -1
1109          RC     .02    .015     .02     880   .0037
1110          RX       0       1       5      35      40      70      74      75
1111          RY     104     102     100      99      99     100     102     104

1112          KK    RDVG2
1113          DR     DVG2

1114          KK    RRDG2
1115          RS       1    FLOW      -1
1116          RC     .02    .015     .02    1000   .0017
1117          RX       0      10      20      30      40      60      60      70
1118          RY     108     104     102     100     100     102     104     108
```



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

1119          KK    SB-H1
1120          BA      .06
1121          LG      .20     .25     6.3     .19    10.0
1122          UC     .387    .296
1123          UA       0       5      16      30      65      77      84      90      94      97
1124          UA     100

1125          KK     CPH1
1126          HC       2

1127          KK     DWPL
1128          KM     DIVERT THROUGH PARADISE LANE WESTWARD
1129          KM     USING ERIE'S RATING VALUES AT THE CROSSING
1130          DT     DVPL
1131          DI       0     144     570    2530    5490
1132          DQ       0      80     310    1540    3050

1133          KK    RDWPL
1134          RS       1    FLOW      -1
1135          RC     .02    .015     .02     720   .0038
```

```
1136          RX      0      1      5     35     40     70     74     75
1137          RY    104    102    100    101    101    100    102    104

1138          KK   SB-H3
1139          BA    .086
1140          LG     .20    .25    6.3    .19      5
1141          UC    .475   .321
1142          UA       0      5     16     30     65     77     84     90     94     97
1143          UA     100

1144          KK    CPH3
1145          HC       3

1146          KK    R-H3
1147          KM   ROUTE TO EXISTING 91ST CHANNEL WESTWARD
1148          RS       1   FLOW     -1
1149          RC     .03    .02    .03    560  .0036
1150          RX       0     10     20     35     45     60     70     80
1151          RY     108    104    102    100    100    102    104    108

1152          KK   SB-H4
1153          BA    .069
1154          LG     .20    .15    8.6    .06    5.0
1155          UC    .408   .349
1156          UA       0      5     16     30     65     77     84     90     94     97
1157          UA     100

1158          KK    CPH4
1159          HC       3
```



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

1160          KK    RCH4
1161          KM   ROUTE THRU EXISTING DRAIN
1162          RS       1   FLOW     -1
1163          RC     .02   .015    .02   1250  .0042
1164          RX       0      6     12     24     36     48     60     72
1165          RY     108    104    102    100    100    102    104    108

1166          KK   SB-H5
1167          BA    .070
1168          LG     .20    .25   5.80    .23    5.0
1169          UC    .421   .358
1170          UA       0      5     16     30     65     77     88     90     94     97
1171          UA     100

1172          KK    CPH5
1173          HC       2

1174          KK   DS91S
1175          KM   DIVERT THRU EXISTING 91ST AVE CHANNEL SPILLWAY PER DESIGN DRAWINGS
1176          KM   DESIGN CAPACITY OF TRIPLE BARREL CULVERT = 743 CFS PLUS FB CAPACITY
1177          KM   FLOW SOUTHWARD ALONG 91ST AVE TOWARDS DESERT HARBOR MPC
1178          DT   DV91S
1179          DI       0    100    743   1170   1900   3000   4700
1180          DQ       0      0      0      0    520   1470   2700

1181          KK    RRMG
1182          KM   ROUTE REMAINING FLOW THRU 91ST CHANNEL TO OUTLET
1183          KM   EXISTING GUNITE CHANNEL WITH 2:1 SS AS PER FCD CONSULTANT DESIGN
1184          RS       1   FLOW     -1
1185          RC    0.02   .015    .02   1720  .0008
1186          RX       0      7     14     20     28     34     41     48
1187          RY     107  103.5    100    100    100    100  103.5    107

1188          KK   RDVPL
1189          DR    DVPL

1190          KK    DVPL
1191          KM   ROUTE THRU 87TH SOUTH OF PARADISE LANE TO EXISTING DRAIN AR GREENWAY RD
1192          RS       1   FLOW     -1
1193          RC     .02   .015    .02   1560  .0090
1194          RX       0      5     20     30     40     50     55     60
1195          RY     103    102    101    101    101    101    102    103

1196          KK   SB-H6
1197          BA    .230
1198          LG     .20    .25   5.80    .23   15.0
1199          UC    .625   .342
1200          UA       0      5     16     30     65     77     84     90     94     97
1201          UA     100
```



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

1202          KK    CPH6
1203          KM   AT OUTLET TO NEW RIVER
1204          HC       3
1205          ZZ
```

1

SCHEMATIC DIAGRAM OF STREAM NETWORK

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

  NO.     (.) CONNECTOR        (<---) RETURN OF DIVERTED OR PUMPED FLOW

   43      SB-A1
              V
              V
   54       R-A1
              .
              .
   59         .        SB-A2
              .           .
              .           .
```

```
 65        CPA2............
              V
              V
 68        R-A2
              .
              .
 73           .        SB-A3
              .           .
              .           .
 79        CPA3............
              V
              V
 82        R-A3
              .
              .
 87           .        SB-A4
              .           .
              .           .
 93        CPA4............
              V
              V
 96        R-A4
              .
              .
101           .        SB-A5
              .           .
              .           .
107        CPA5............
              .
              .
110           .        SB-A6
              .           V
              .           V
116           .         R-A6
              .           .
              .           .
121           .           .        SB-A7
              .           .           .
              .           .           .
127        CPA7........................
              .
              .
130           .        SB-B1
              .           V
              .           V
136           .         R-B1
              .           .
              .           .
141           .           .        SB-B2
              .           .           .
              .           .           .
148           .         CPB2............
              .           V
              .           V
150           .         R-B2
              .           .
              .           .
155           .           .        SB-B3
              .           .           .
              .           .           .
161           .         CPB3............
              .           V
              .           V
164           .         R-B3
              .           .
              .           .
169           .           .        SB-B4
              .           .           .
              .           .           .
175           .         CPB4............
              .           .
              .           .
180           .           .-------->     DB4
178           .         D-B4
              .           V
              .           V
183           .         R-B4
              .           .
              .           .
189           .           .        SB-B5
              .           .           V
              .           .           V
195           .           .         R-B5
              .           .           .
              .           .           .
200           .           .           .        SB-B6
              .           .           .           .
              .           .           .           .
206           .           .         CPB6............
              .           .           V
              .           .           V
209           .           .         R-B6
              .           .           .
              .           .           .
214           .           .           .        SB-B7
              .           .           .           .
              .           .           .           .
220        CPB7.......................................
              V
              V
223       RWBW1
              .
              .
229           .          WBW
              .           .
              .           .
237        CWBW............
              V
```

```
                V
239          RBWB
                V
                V
248         RRBOF
                .
                .
254             .        SB-C1
                .           V
                .           V
262             .        R-C1
                .           .
                .           .
268             .           .        SB-C2
                .           .           .
                .           .           .
275             .        CPC2............
                .           .
                .           .
280             .           .-------->     DC2
278             .        D-C2
                .           V
                .           V
283             .        R-C2
                .           .
                .           .
289             .           .           C3
                .           .           .
                .           .           .
295             .        CPC3............
                .           V
                .           V
298             .        R-C3
                .           .
                .           .
303             .           .        SB-C4
                .           .           .
                .           .           .
310             .       CPC4A............
                .           .
                .           .
314             .           .           .<-------      DB4
313             .           .          DB4
                .           .           .
                .           .           .
315             .        CPC4............
                .           V
                .           V
318             .        R-C4
                .           .
                .           .
324             .           .        SB-C5
                .           .           .
                .           .           .
331             .        CPC5............
                .           .
                .           .
336             .           .-------->     DC5
334             .        D-C5
                .           .
                .           .
339             .           .      WB-P8B
                .           .           .
                .           .           .
347             .        CP5B............
                .           V
                .           V
350             .        R-5B
                .           .
                .           .
357             .           .          WB9
                .           .           V
                .           .           V
364             .           .       R-R10
                .           .           .
                .           .           .
371             .        91ST............
                .           .
                .           .
374             .           .       SB-D1
                .           .           V
                .           .           V
380             .           .        R-D1
                .           .           .
                .           .           .
385             .           .           .       SB-D2
                .           .           .           .
                .           .           .           .
391             .           .        CPD2............
                .           .           .
                .           .           .
396             .           .           .-------->     DD2
394             .           .        DVD2
                .           .           V
                .           .           V
399             .           .        R-D2
                .           .           .
                .           .           .
404             .           .           .       SB-D3
                .           .           .           .
                .           .           .           .
410             .           .        CPD3............
                .           .           V
                .           .           V
413             .           .        R-D3
                .           .           .
                .           .           .
418             .           .           .       SB-D4
```

```
424          CPD4............
                V
                V
427          R-D4
432                SB-D5
438          CPD5............
                V
                V
441          R-D5
446                SB-D6
452          CPD6............
                V
                V
455          R-D6
461                SB-D7
                      V
                      V
468                R-D7
474                      SB-D93
480                CPD9............
484                      -------> D93E
482                D93E
                      V
                      V
487                RD93
494                            <------- DC2
492                         DC2
495                                SB-D9
503                                          <------- D93E
502                                      RD93E
504                                                SB-D10
511                CPD10..............................................
                      V
                      V
515                R-D10
521                      SB-D11
528                CPD11............
                      V
                      V
531                R-D11
537                      SB-D12
545                                      <------- DC5
544                                    DC5
546          WBE1...................................
                V
                V
551        R-WBE1
557                WB1
565          CPWB1............
                V
                V
568          R-R3
574                WB2
581          CPWB2............
                V
                V
584          R-4-5
590                WB3
```

```
597                 CPWB3............
                      V
                      V
600                 R-6
                      .
606                   .       SB-F1
                      .
                      .
612                   .                QINP
                      .                  .
                      .                  .
619                   .        CIQF............
                      .          V
                      .          V
621                   .       RCIQF
                      .
                      .
626                   .                SB-F2
                      .                  .
                      .                  .
633                   .        CPF2............
                      .          V
                      .          V
636                   .        R-F2
                      .
                      .
641                   .                SB-F3
                      .                  .
                      .                  .
647                   .        CPF3............
                      .          V
                      .          V
650                   .        R-F3
                      .
                      .
655                   .                SB-F4
                      .                  .
                      .                  .
661                   .        CPF4............
                      .          V
                      .          V
664                   .        R-F4
                      .
                      .
669                   .                SB-F5
                      .                  .
                      .                  .
675                   .        CPF5............
                      .
                      .
678                   .                SB-E1
                      .                  .
                      .                  .
686                   .                  .          .<-------     DD2
684                   .                  .        RD2
                      .                  .          .
                      .                  .          .
687                   .                CED2............
                      .                  .
                      .                  .
692                   .                  ..------->    DVCL
690                   .                DCLE
                      .                  V
                      .                  V
695                   .                 RED
                      .                  .
                      .                  .
700                   .                  .       SB-E2
                      .                  .          .
                      .                  .          .
706                   .                CPE2............
                      .                  V
                      .                  V
709                   .                R-E2
                      .                  .
                      .                  .
714                   .                  .       SB-E3
                      .                  .          .
                      .                  .          .
720                   .                CPE3............
                      .                  V
                      .                  V
723                   .                R-E3
                      .                  .
                      .                  .
728                   .                  .       SB-E4
                      .                  .          .
                      .                  .          .
734                   .                CPE4............
                      .                  V
                      .                  V
737                   .                R-E4
                      .                  .
                      .                  .
742                   .                  .       SB-E5
                      .                  .          .
                      .                  .          .
748                   .                CPE5............
                      .                  V
                      .                  V
751                   .                R-E5
                      .                  .
                      .                  .
756                   .        CPF5............
                      .          V
                      .          V
759                   .        R-F5
```

```
764                                                  SB-F6
770                                          CPF6............
775                                                 -------->    DV83
773                                          DVER
                                                V
                                                V
778                                          R-F6
784                                                  SB-F7
790                                          WBE2............
793                                                    WB4
800                                          CPWB4...........
                                                V
                                                V
803                                          R-R1
809                                                    WB5
816                                          CPWB5...........
                                                V
                                                V
819                                          R-R2
825                                  CPR6............
                                        V
                                        V
828                                  RCR26
833                                            WB7
840                                  CR6W7...........
                                        V
                                        V
842                                  R-R7
848                                            WB6
                                                V
                                                V
855                                          R-R8
861                                  C7R8............
                                        V
                                        V
864                                  RC78
870                                            WB8
877                                 CP-678...........
879                                          WB10
                                                V
                                                V
886                                          R-R9
892                                  WBEOT...........
898                                             -------->    TONR
896                                  DVNR
904                                             -------->    DCLUB
901                                  CCLUB
                                        V
                                        V
907                                  RR287
918                                             -------->    DV87S
913                                  DV87S
                                        V
                                        V
921                                  RR289
931                                             -------->    DV89
927                                  DS89
                                        V
                                        V
934                                  RR291
939                          CP91............
```

```
944          .          .------->   DV91
942          .       DV91
             .          V
             .          V
947          .      RDV91
             .          .
             .          .
952       CP93...........
             V
             V
955      R93RD
             .
             .
961          .      SB-G6
             .          .
             .          .
967       CPG6...........
             V
             V
969      R93G6
             .
             .
975          .          .<-------   DV91
974          .       R91S
             .          V
             .          V
976          .      RDV91
             .          .
             .          .
981      CRG6C...........
             V
             V
983     RCG691
             .
             .
990          .          .<-------   DV87S
988          .      DV87S
             .          V
             .          V
991          .     RDV87S
             .          .
             .          .
997          .          .      SB-G1
             .          .          .
             .          .          .
1003         .       CPG1...........
             .          V
             .          V
1006         .       R-G1
             .          .
             .          .
1011         .          .      SB-G2
             .          .          .
             .          .          .
1017         .       CPG2...........
             .          .
             .          .
1022         .          .------->   BD2NR
1020         .      BEL87
             .          .
             .          .
1027         .          .------->   DVG2
1025         .       BDVW
             .          V
             .          V
1030         .      RCBG2
             .          .
             .          .
1037         .          .          .<-------   DV89
1036         .          .      RDV89
             .          .          V
             .          .          V
1038         .          .      RDV89
             .          .          .
             .          .          .
1043         .          .          .      SB-G3
             .          .          .          .
             .          .          .          .
1049         .      CP-G3.......................
             .          V
             .          V
1052         .       RBG3
             .          .
             .          .
1057         .          .      SB-G4
             .          .          .
             .          .          .
1063      CPG4........................
             .
             .
1068         .------->   DVG4
1066     DV2CP
             V
             V
1071      RWG4
             .
             .
1077         .      SB-G5
             .          .
             .          .
1083      CPG5...........
             V
             V
1085      RCG5
             .
             .
1092         .          .<-------   DVG4
```

```
1091            .        RDVG4
                .           V
                .           V
1093            .        RDG4
                .           .
                .           .
1098            .           .        SB-H2
                .           .           .
                .           .           .
1104            .      - CPH2............
                .           V
                .           V
1107            .        R-H2
                .           .
                .           .
1113            .           .           .<-------    DVG2
1112            .           .        RDVG2
                .           .           V
                .           .           V
1114            .           .        RRDG2
                .           .           .
                .           .           .
1119            .           .           .        SB-H1
                .           .           .           .
                .           .           .           .
1125            .           .        CPH1............
                .           .           .
                .           .           .
1130            .           .           .------->    DVPL
1127            .           .        DWPL
                .           .           V
                .           .           V
1133            .           .        RDWPL
                .           .           .
                .           .           .
1138            .           .           .        SB-H3
                .           .           .           .
                .           .           .           .
1144            .        CPH3........................
                .           V
                .           V
1146            .        R-H3
                .           .
                .           .
1152            .           .        SB-H4
                .           .           .
                .           .           .
1158         CPH4........................
                V
                V
1160         RCH4
                .
                .
1166            .        SB-H5
                .           .
                .           .
1172         CPH5............
                .
                .
1178            .------->   DV91S
1174        DS91S
                V
                V
1181         RRMG
                .
                .
1189            .           .<-------    DVPL
1188            .        RDVPL
                .           V
                .           V
1190            .        DVPL
                .           .
                .           .
1196            .           .        SB-H6
                .           .           .
                .           .           .
1202         CPH6........................
```

(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

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1****************************************
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 *                                      *                                    *
 *                                      *                                    *
 *   FLOOD HYDROGRAPH PACKAGE  (HEC-1)  *                                    *   U.S. ARMY CORPS OF ENGINEERS
 *                                      *                                    *
 *            SEPTEMBER 1990            *                                    *   HYDROLOGIC ENGINEERING CENTER
 *                                      *                                    *
 *             VERSION 4.0              *                                    *         609 SECOND STREET
 *                                      *                                    *
 *                                      *                                    *      DAVIS, CALIFORNIA 95616
 *                                      *                                    *
 *  RUN DATE  09/29/1994  TIME  11:46:29 *                                    *           (916) 756-1104
 *                                      *                                    *
 *                                      *                                    *
 ****************************************
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91ST AVENUE HYDROLOGY NORTH OF GREENWAY ROAD DATAFILE:91ST.DAT
FCD-WSMB HEC-1 MODEL DEVELOPMENT FOR EXISTING CONDITIONS
REVISION DATE: JUNE 20, 1994. AA AND FT COMMENTS HAVE BEEN INCORPORATED.
*** THIS EXCLUDED A SUBDIVISION AREA THRU COUNTRY CLUB ROAD AND INCLUDED
POSSIBLE BLEED OFF THRU WBV WEST AS PER MEETING MAY 9, 1994
WITH DEVELOPMENT SERVICES DIVISION, CITY OF PEORIA

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                    RUN WITH 350 AC-FT RETENTION IN WEST WESTBROOK VILLAGE AND ERIE'S DATA
                    BASIC ASSUMPTIONS AS PER MEETINGS WITH THE CITY OF PERORIA
                           :MAX. OF 137 CFS EASTWARD DIVERSION ALONG CALLE LEJOS AT CP-D2 TO 83RD
                           :DATA FROM PRELIM. DRAINAGE REPORT OF AM. ENGG. CO. DATED 12/1993
                           :AT 83RD & BEARDSLEY INTERSECTION, 30% GOES WEST AND 70% GO SOUTH
                           :AT INLET TO WEST WB NO EASTWARD DIVERSION OF 30% ALONG BEARDSLEY RD
                           :MAX. OF 100 CFS EASTWARD DIVESION ALONG UNION HILLS TO N.R.
                           :MAX. OF 150 CFS EASTWARD DIVERSION ALONG BELL RD TO N.R.
                           :NO INFLOW FROM SUN CITY AT EITHER BELL RD OR UNION HILLS RD
                           :SPILL THRU 91ST AVE SOUTH OF GREENWAY RO
                    MODELED AREA : CATCHMENT AREA NORTH OF GREENWAY RD = 9.80 SQ.MILES
                    RAINFALL     : 100YR-6HR = 3.20 INCHES
                    LOSS RATES   : GREEN AND AMPT BASED ON 5 DOMINANT SOIL MAPPING UNITS
                                 : LS RECORDS IN EAST WESTBROOK VILLAGE CONVERTED TO LG
                                 : AMC AT NORMAL CONDITION  W/ DTHETA= 0.10 TO .30
                                 : XKSAT CORRECTED FOR VEGETATION COVER
                    HYDROGRAPH   : CLARK UNIT HYDROGRAPH (MCUHP1)
                    ROUTING METH : NORMAL DEPTH ROUTING PROCEDURE USING HYPOTHE. CHANNEL 700'
                                   WIDE WITH DEPTH UP TO 2 FT, S.S. 1:1, BOTTOM N=0.04
                    RETENTION    : MAXIMUM STORAGE OF 350 AC-FT IN WESTBROOK VILLAGE WEST
                                   AS ESTIMATED BY ERIE & ASSOC WAS USED INSTEAD OF 472 AC-FT
                                   AS REPORTED BY CONSULTANT IN UDC REPORT DATED 1983
                                   ALL RETENTION BASINS IN WESTBROOK VILLAGE EAST ARE USED
                                   AS PER DRAINAGE MASTER PLAN REVISED APRIL 1993 BY IMC
                                   CONSULTANTS LTD
                    SPLIT FLOWS  : RATING TABLES DEVELOPED BY ERIE & ASSOCIATES, INC. FOR
                                 : SOME STREET CROSSINGS WERE INCORPORATED INTO THE MODEL
                                 : ASSUMES INFLOW AT DIVERSION AS SUM OF TWO FLOWS PER RATING
                         DIVERSION AT WESTBROOK VILLAGE EAST SOUTH OUTLET INTERSECTION WITH
                         UNION HILLS ROAD SPLITS TO NEW RIVER, COUNTRY CLUB RD AND 91ST AVE
                         WEIR FLOW EXISTS OVER UNION HILLS CROWN SOUTH OF WESTBROOK VILLAGE EAST
                         SOUTHWARD OVERFLOW PRORATED AS PER CREST LENGTH WITH Q=CLH**1.5
                         WHERE C=2.6, L = CREST LENGTH, H = HEAD OVER ROAD CROWN
                         91ST FLOW SPLITS AT 87TH AVE AND 89TH AVE AND REMAINING FLOW TO 91ST AV

 42 IO          OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                       NMIN          5  MINUTES IN COMPUTATION INTERVAL
                      IDATE     20JUN94  STARTING DATE
                      ITIME       1200  STARTING TIME
                         NQ        300  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE     21JUN94  ENDING DATE
                     NDTIME       1255  ENDING TIME
                      ICENT         19  CENTURY MARK

                 COMPUTATION INTERVAL     .08 HOURS
                      TOTAL TIME BASE   24.92 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

WARNING --- ROUTED OUTFLOW (   1207.) IS GREATER THAN MAXIMUM OUTFLOW (   1207.) IN STORAGE-OUTFLOW TABLE

 688 KO         OUTPUT CONTROL VARIABLES
                      IPRNT          5  PRINT CONTROL
                      IPLOT          0  PLOT CONTROL
                      QSCAL         0.  HYDROGRAPH PLOT SCALE
                      IPNCH          0  PUNCH COMPUTED HYDROGRAPH
                       IOUT         21  SAVE HYDROGRAPH ON THIS UNIT
                      ISAV1          1  FIRST ORDINATE PUNCHED OR SAVED
                      ISAV2        300  LAST ORDINATE PUNCHED OR SAVED
                     TIMINT       .083  TIME INTERVAL IN HOURS

1
                                          RUNOFF SUMMARY
                                     FLOW IN CUBIC FEET PER SECOND
                                  TIME IN HOURS,  AREA IN SQUARE MILES

                                   PEAK   TIME OF    AVERAGE FLOW FOR MAXIMUM PERIOD      BASIN    MAXIMUM    TIME OF
        OPERATION        STATION   FLOW    PEAK                                          AREA     STAGE    MAX STAGE
+                                                     6-HOUR     24-HOUR     72-HOUR
        HYDROGRAPH AT
+                        SB-A1      72.    4.33        12.         3.          3.        .12
        ROUTED TO
+                         R-A1      59.    4.75        12.         3.          3.        .12
+                                                                                                  100.31      4.75
        HYDROGRAPH AT
+                        SB-A2      79.    4.67        21.         5.          5.        .20
        2 COMBINED AT
+                         CPA2     139.    4.67        33.         8.          8.        .32
        ROUTED TO
+                         R-A2     129.    5.00        33.         8.          8.        .32
+                                                                                                  100.47      5.00
        HYDROGRAPH AT
+                        SB-A3      71.    4.75        17.         4.          4.        .17
        2 COMBINED AT
+                         CPA3     196.    4.92        50.        13.         12.        .50
        ROUTED TO
+                         R-A3     185.    5.17        50.        13.         12.        .50
+                                                                                                  100.61      5.17
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+	HYDROGRAPH AT	SB-A4	89.	4.58	16.	4.	4.	.14	
+	2 COMBINED AT	CPA4	230.	5.08	66.	17.	16.	.64	
+ +	ROUTED TO	R-A4	218.	5.33	65.	17.	16.	.64	100.68 5.33
+	HYDROGRAPH AT	SB-A5	30.	4.92	10.	2.	2.	.09	
+	2 COMBINED AT	CPA5	243.	5.33	75.	19.	19.	.73	
+	HYDROGRAPH AT	SB-A6	51.	4.42	10.	2.	2.	.09	
+ +	ROUTED TO	R-A6	38.	4.83	10.	2.	2.	.09	100.24 4.83
+	HYDROGRAPH AT	SB-A7	50.	4.58	11.	3.	3.	.08	
+	3 COMBINED AT	CPA7	294.	5.25	95.	24.	24.	.90	
+	HYDROGRAPH AT	SB-B1	86.	4.17	11.	3.	3.	.09	
+ +	ROUTED TO	R-B1	79.	4.25	11.	3.	3.	.09	100.51 4.25
+	HYDROGRAPH AT	SB-B2	145.	4.25	21.	5.	5.	.16	
+	2 COMBINED AT	CPB2	224.	4.25	32.	8.	8.	.25	
+ +	ROUTED TO	R-B2	221.	4.25	32.	8.	8.	.25	100.71 4.25
+	HYDROGRAPH AT	SB-B3	53.	4.92	15.	4.	4.	.12	
+	2 COMBINED AT	CPB3	240.	4.33	47.	12.	11.	.37	
+ +	ROUTED TO	R-B3	217.	4.67	47.	12.	11.	.37	100.52 4.67
+	HYDROGRAPH AT	SB-B4	121.	5.08	35.	9.	9.	.32	
+	2 COMBINED AT	CPB4	301.	4.83	82.	21.	20.	.69	
+	DIVERSION TO	DB4	151.	4.83	41.	10.	10.	.69	
+	HYDROGRAPH AT	D-B4	151.	4.83	41.	10.	10.	.69	
+ +	ROUTED TO	R-B4	123.	5.33	40.	10.	10.	.69	100.49 5.33
+	HYDROGRAPH AT	SB-B5	39.	4.83	11.	3.	3.	.11	
+ +	ROUTED TO	R-B5	30.	5.25	11.	3.	3.	.11	100.21 5.25
+	HYDROGRAPH AT	SB-B6	102.	4.50	17.	4.	4.	.16	
+	2 COMBINED AT	CPB6	109.	4.50	27.	7.	7.	.27	
+ +	ROUTED TO	R-B6	80.	5.17	27.	7.	7.	.27	100.38 5.17
+	HYDROGRAPH AT	SB-B7	372.	4.25	79.	20.	19.	.67	
+	4 COMBINED AT	CPB7	614.	5.17	239.	62.	59.	2.53	
+ +	ROUTED TO	RWBW1	601.	5.42	237.	62.	59.	2.53	100.91 5.42
+	HYDROGRAPH AT	WBW	618.	4.83	184.	47.	46.	1.00	
+	2 COMBINED AT	CWBW	1108.	5.08	414.	109.	105.	3.53	
+ +	ROUTED TO	RBWB	25.	4.83	25.	22.	21.	3.53	30.00 10.33

+	ROUTED TO	RRBOF	25.	7.00	25.	21.	20.	3.53	100.20	7.08
+										
+	HYDROGRAPH AT	SB-C1	67.	4.25	11.	3.	3.	.10		
+	ROUTED TO	R-C1	64.	4.50	11.	3.	3.	.10	100.34	4.50
+										
+	HYDROGRAPH AT	SB-C2	193.	4.17	29.	7.	7.	.19		
+	2 COMBINED AT	CPC2	230.	4.25	40.	10.	10.	.29		
+	DIVERSION TO	DC2	23.	4.25	6.	1.	1.	.29		
+	HYDROGRAPH AT	D-C2	207.	4.25	35.	9.	8.	.29		
+	ROUTED TO	R-C2	202.	4.33	35.	9.	8.	.29	100.73	4.33
+										
+	HYDROGRAPH AT	C3	36.	4.17	7.	2.	2.	.04		
+	2 COMBINED AT	CPC3	237.	4.33	41.	10.	10.	.33		
+	ROUTED TO	R-C3	233.	4.42	41.	10.	10.	.33	100.79	4.42
+										
+	HYDROGRAPH AT	SB-C4	53.	4.33	12.	3.	3.	.07		
+	2 COMBINED AT	CPC4A	285.	4.42	53.	13.	13.	.40		
+	HYDROGRAPH AT	DB4	151.	4.83	41.	10.	10.	.00		
+	2 COMBINED AT	CPC4	402.	4.50	94.	24.	23.	.40		
+	ROUTED TO	R-C4	395.	4.75	93.	24.	23.	.40	101.12	4.75
+										
+	HYDROGRAPH AT	SB-C5	88.	4.42	23.	6.	6.	.12		
+	2 COMBINED AT	CPC5	471.	4.67	115.	29.	28.	.52		
+	DIVERSION TO	DC5	141.	4.67	34.	9.	9.	.52		
+	HYDROGRAPH AT	D-C5	330.	4.67	80.	21.	20.	.52		
+	HYDROGRAPH AT	WB-P8B	11.	4.00	2.	0.	0.	.01		
+	2 COMBINED AT	CP5B	332.	4.67	82.	21.	20.	.53		
+	ROUTED TO	R-5B	322.	4.75	82.	21.	20.	.53	101.35	4.75
+										
+	HYDROGRAPH AT	WB9	328.	4.08	62.	16.	15.	.28		
+	ROUTED TO	R-R10	43.	5.17	33.	16.	15.	.28	32.46	5.17
+										
+	2 COMBINED AT	91ST	363.	4.83	114.	37.	35.	.81		
+	HYDROGRAPH AT	SB-D1	99.	4.17	12.	3.	3.	.13		
+	ROUTED TO	R-D1	97.	4.25	12.	3.	3.	.13	100.52	4.25
+										
+	HYDROGRAPH AT	SB-D2	27.	4.50	7.	2.	2.	.07		
+	2 COMBINED AT	CPD2	121.	4.25	19.	5.	5.	.20		
+	DIVERSION TO	DD2	121.	.08	19.	5.	5.	.20		
+	HYDROGRAPH AT	DVD2	0.	.08	0.	0.	0.	.20		
+	ROUTED TO	R-D2	0.	.08	0.	0.	0.	.20	100.00	.00
+										

+	HYDROGRAPH AT	SB-D3	92.	4.33	17.	4.	4.	.11	
+	2 COMBINED AT	CPD3	92.	4.33	17.	4.	4.	.32	
+	ROUTED TO	R-D3	90.	4.42	17.	4.	4.	.32	100.52 4.42
+	HYDROGRAPH AT	SB-D4	99.	4.33	19.	5.	5.	.12	
+	2 COMBINED AT	CPD4	187.	4.42	36.	9.	9.	.44	
+	ROUTED TO	R-D4	183.	4.50	36.	9.	9.	.44	101.73 4.50
+	HYDROGRAPH AT	SB-D5	198.	4.33	41.	10.	10.	.19	
+	2 COMBINED AT	CPD5	378.	4.42	76.	19.	19.	.63	
+	ROUTED TO	R-D5	369.	4.58	76.	19.	19.	.63	100.78 4.58
+	HYDROGRAPH AT	SB-D6	161.	4.33	34.	9.	8.	.14	
+	2 COMBINED AT	CPD6	520.	4.50	111.	28.	27.	.77	
+	ROUTED TO	R-D6	498.	4.67	110.	28.	27.	.77	100.94 4.67
+	HYDROGRAPH AT	SB-D7	132.	4.17	17.	4.	4.	.15	
+	ROUTED TO	R-D7	127.	4.25	17.	4.	4.	.15	100.64 4.25
+	HYDROGRAPH AT	SB-D93	152.	4.17	24.	6.	6.	.15	
+	2 COMBINED AT	CPD9	273.	4.25	41.	10.	10.	.30	
+	DIVERSION TO	D93E	82.	4.25	12.	3.	3.	.30	
+	HYDROGRAPH AT	D93E	191.	4.25	29.	7.	7.	.30	
+	ROUTED TO	RD93	183.	4.33	29.	7.	7.	.30	100.79 4.33
+	HYDROGRAPH AT	DC2	23.	4.25	6.	1.	1.	.00	
+	HYDROGRAPH AT	SB-D9	255.	4.33	50.	13.	12.	.31	
+	HYDROGRAPH AT	RD93E	82.	4.25	12.	3.	3.	.00	
+	HYDROGRAPH AT	SB-D10	68.	4.25	14.	4.	3.	.08	
+	5 COMBINED AT	CPD10	607.	4.33	111.	28.	27.	.69	
+	ROUTED TO	R-D10	603.	4.33	111.	28.	27.	.69	101.73 4.33
+	HYDROGRAPH AT	SB-D11	69.	4.25	14.	4.	3.	.08	
+	2 COMBINED AT	CPD11	672.	4.33	125.	31.	30.	.77	
+	ROUTED TO	R-D11	514.	4.67	122.	31.	30.	.77	101.12 4.67
+	HYDROGRAPH AT	SB-D12	86.	4.83	25.	6.	6.	.18	
+	HYDROGRAPH AT	DC5	141.	4.67	34.	9.	9.	.00	
+	4 COMBINED AT	WBE1	1236.	4.67	292.	74.	72.	1.72	
+	ROUTED TO	R-WBE1	1235.	4.67	292.	74.	72.	1.72	44.97 4.67
+	HYDROGRAPH AT	WB1	153.	4.17	29.	7.	7.	.12	

+	2 COMBINED AT	CPWB1	1321.	4.67	319.	82.	79.	1.84	
+	ROUTED TO	R-R3	1148.	4.92	314.	82.	79.	1.84	37.87 4.92
+	HYDROGRAPH AT	WB2	101.	4.50	26.	6.	6.	.10	
+	2 COMBINED AT	CPWB2	1226.	4.92	338.	88.	85.	1.94	
+	ROUTED TO	R-4-5	1207.	5.00	260.	78.	75.	1.94	37.00 5.00
+	HYDROGRAPH AT	WB3	17.	4.08	3.	1.	1.	.01	
+	2 COMBINED AT	CPWB3	1209.	5.00	261.	79.	76.	1.96	
+	ROUTED TO	R-6	1198.	5.08	261.	79.	76.	1.96	36.99 5.08
+	HYDROGRAPH AT	SB-F1	82.	4.25	12.	3.	3.	.11	
+	HYDROGRAPH AT	QINP	176.	.58	22.	6.	6.	.17	
+	2 COMBINED AT	CIQF	176.	.58	34.	9.	9.	.28	
+	ROUTED TO	RCIQF	160.	.67	33.	9.	9.	.28	100.72 .67
+	HYDROGRAPH AT	SB-F2	69.	4.42	14.	3.	3.	.10	
+	2 COMBINED AT	CPF2	160.	.67	47.	13.	12.	.39	
+	ROUTED TO	R-F2	142.	4.50	46.	13.	12.	.39	100.73 4.50
+	HYDROGRAPH AT	SB-F3	170.	4.50	47.	12.	11.	.18	
+	2 COMBINED AT	CPF3	312.	4.50	92.	24.	23.	.57	
+	ROUTED TO	R-F3	305.	4.58	91.	24.	23.	.57	101.18 4.58
+	HYDROGRAPH AT	SB-F4	144.	4.33	30.	8.	7.	.14	
+	2 COMBINED AT	CPF4	436.	4.50	121.	32.	31.	.70	
+	ROUTED TO	R-F4	434.	4.58	120.	32.	31.	.70	101.52 4.58
+	HYDROGRAPH AT	SB-F5	42.	4.42	8.	2.	2.	.06	
+	2 COMBINED AT	CPF5	474.	4.58	129.	34.	33.	.76	
+	HYDROGRAPH AT	SB-E1	61.	4.33	10.	2.	2.	.10	
+	HYDROGRAPH AT	RD2	121.	4.25	19.	5.	5.	.00	
+	2 COMBINED AT	CED2	179.	4.25	28.	7.	7.	.10	
+	DIVERSION TO	DVCL	137.	4.25	26.	7.	6.	.10	
+	HYDROGRAPH AT	DCLE	42.	4.25	2.	1.	1.	.10	
+	ROUTED TO	RED	15.	4.67	2.	1.	1.	.10	100.12 4.67
+	HYDROGRAPH AT	SB-E2	105.	4.58	20.	5.	5.	.15	
+	2 COMBINED AT	CPE2	120.	4.58	23.	6.	5.	.25	
+	ROUTED TO	R-E2	110.	4.83	22.	6.	5.	.25	100.44 4.83
+	HYDROGRAPH AT	SB-E3	126.	4.25	23.	6.	6.	.14	

+	2 COMBINED AT	CPE3	184.	4.67	45.	11.	11.	.39	
+	ROUTED TO	R-E3	180.	4.75	45.	11.	11.	.39	100.87 4.75
+	HYDROGRAPH AT	SB-E4	114.	4.33	26.	6.	6.	.10	
+	2 COMBINED AT	CPE4	272.	4.58	70.	18.	17.	.49	
+	ROUTED TO	R-E4	266.	4.83	70.	18.	17.	.49	100.81 4.83
+	HYDROGRAPH AT	SB-E5	115.	4.33	24.	6.	6.	.11	
+	2 COMBINED AT	CPE5	355.	4.67	94.	24.	23.	.60	
+	ROUTED TO	R-E5	336.	4.92	94.	24.	23.	.60	101.00 4.92
+	2 COMBINED AT	CPF5	783.	4.67	216.	58.	56.	1.36	
+	ROUTED TO	R-F5	761.	4.83	215.	58.	56.	1.36	102.37 4.83
+	HYDROGRAPH AT	SB-F6	41.	4.25	8.	2.	2.	.03	
+	2 COMBINED AT	CPF6	782.	4.83	223.	60.	58.	1.39	
+	DIVERSION TO	DV83	547.	4.83	156.	42.	40.	1.39	
+	HYDROGRAPH AT	DVER	235.	4.83	67.	18.	17.	1.39	
+	ROUTED TO	R-F6	230.	4.92	67.	18.	17.	1.39	101.42 4.92
+	HYDROGRAPH AT	SB-F7	387.	4.33	80.	20.	19.	.36	
+	2 COMBINED AT	WBE2	525.	4.58	147.	38.	37.	1.75	
+	HYDROGRAPH AT	WB4	79.	4.08	14.	3.	3.	.06	
+	2 COMBINED AT	CPWB4	563.	4.58	161.	42.	40.	1.82	
+	ROUTED TO	R-R1	575.	4.42	150.	42.	40.	1.82	43.76 4.42
+	HYDROGRAPH AT	WB5	92.	4.17	17.	4.	4.	.08	
+	2 COMBINED AT	CPWB5	650.	4.42	165.	46.	44.	1.90	
+	ROUTED TO	R-R2	581.	4.75	113.	42.	40.	1.90	33.62 4.75
+	2 COMBINED AT	CPR6	1658.	5.00	374.	120.	116.	3.85	
+	ROUTED TO	RCR26	1621.	5.17	374.	120.	115.	3.85	103.17 5.17
+	HYDROGRAPH AT	WB7	49.	4.08	9.	2.	2.	.03	
+	2 COMBINED AT	CR6W7	1627.	5.17	378.	122.	117.	3.89	
+	ROUTED TO	R-R7	1631.	5.17	372.	120.	116.	3.89	33.22 5.17
+	HYDROGRAPH AT	WB6	102.	4.25	21.	5.	5.	.08	
+	ROUTED TO	R-R8	20.	5.33	17.	5.	5.	.08	30.34 5.33
+	2 COMBINED AT	C7R8	1651.	5.17	388.	125.	121.	3.97	
+	ROUTED TO	RC78	1643.	5.17	388.	125.	121.	3.97	102.53 5.17
	HYDROGRAPH AT								

+		WB8	51.	4.08	9.	2.	2.	.03	
+	2 COMBINED AT	CP-678	1648.	5.17	393.	127.	123.	4.01	
+	HYDROGRAPH AT	WB10	68.	4.17	12.	3.	3.	.06	
+	ROUTED TO	R-R9	21.	4.75	12.	3.	3.	.06	28.46 4.75
+	2 COMBINED AT	WBEOT	1668.	5.17	403.	130.	126.	4.06	
+	DIVERSION TO	TONR	100.	5.17	55.	14.	13.	4.06	
+	HYDROGRAPH AT	DVNR	1568.	5.17	349.	117.	113.	4.06	
+	DIVERSION TO	DCLUB	350.	5.17	65.	16.	16.	4.06	
+	HYDROGRAPH AT	CCLUB	1218.	5.17	284.	101.	97.	4.06	
+	ROUTED TO	RR287	1215.	5.17	284.	101.	97.	4.06	103.04 5.17
+	DIVERSION TO	DV87S	361.	5.17	67.	17.	16.	4.06	
+	HYDROGRAPH AT	DV87S	854.	5.17	217.	84.	81.	4.06	
+	ROUTED TO	RR289	855.	5.25	217.	84.	81.	4.06	102.08 5.25
+	DIVERSION TO	DV89	427.	5.25	76.	19.	18.	4.06	
+	HYDROGRAPH AT	DS89	427.	5.25	141.	65.	62.	4.06	
+	ROUTED TO	RR291	423.	5.33	140.	64.	62.	4.06	101.87 5.33
+	2 COMBINED AT	CP91	698.	5.25	254.	101.	97.	4.87	
+	DIVERSION TO	DV91	516.	5.25	187.	74.	71.	4.87	
+	HYDROGRAPH AT	DV91	182.	5.25	68.	27.	26.	4.87	
+	ROUTED TO	RDV91	179.	5.33	67.	27.	26.	4.87	101.29 5.33
+	2 COMBINED AT	CP93	204.	5.33	90.	48.	46.	8.40	
+	ROUTED TO	R93RD	204.	5.33	90.	48.	46.	8.40	100.89 5.33
+	HYDROGRAPH AT	SB-G6	30.	4.17	5.	1.	1.	.03	
+	2 COMBINED AT	CPG6	206.	5.33	93.	49.	47.	8.43	
+	ROUTED TO	R93G6	202.	5.42	93.	49.	47.	8.43	103.65 5.42
+	HYDROGRAPH AT	R91S	516.	5.25	187.	74.	71.	.00	
+	ROUTED TO	RDV91	517.	5.25	187.	74.	71.	.00	101.74 5.25
+	2 COMBINED AT	CRG6C	705.	5.25	280.	123.	118.	8.43	
+	ROUTED TO	RCG691	702.	5.33	279.	122.	118.	8.43	102.30 5.33
+	HYDROGRAPH AT	DV87S	361.	5.17	67.	17.	16.	.00	
+	ROUTED TO	RDV87S	362.	5.25	67.	17.	16.	.00	101.38 5.25
+	HYDROGRAPH AT	SB-G1	49.	4.00	9.	2.	2.	.03	
+	2 COMBINED AT	CPG1	365.	5.25	75.	19.	18.	.03	

+	ROUTED TO	R-G1	332.	5.50	75.	19.	18.	.03	101.40	5.50
+										
+	HYDROGRAPH AT	SB-G2	77.	4.17	16.	4.	4.	.06		
+	2 COMBINED AT	CPG2	340.	5.42	90.	23.	22.	.10		
+	DIVERSION TO	BD2NR	150.	5.42	65.	16.	16.	.10		
+	HYDROGRAPH AT	BEL87	190.	5.42	25.	6.	6.	.10		
+	DIVERSION TO	DVG2	121.	5.42	17.	5.	4.	.10		
+	HYDROGRAPH AT	BDVW	69.	5.42	7.	2.	2.	.10		
+	ROUTED TO	RCBG2	60.	5.58	7.	2.	2.	.10	100.82	5.58
+										
+	HYDROGRAPH AT	RDV89	427.	5.25	76.	19.	18.	.00		
+	ROUTED TO	RDV89	385.	5.50	76.	19.	18.	.00	101.42	5.50
+										
+	HYDROGRAPH AT	SB-G3	204.	4.58	53.	13.	13.	.26		
+	3 COMBINED AT	CP-G3	521.	5.50	135.	34.	33.	.36		
+	ROUTED TO	RBG3	520.	5.50	135.	34.	33.	.36	102.05	5.50
+										
+	HYDROGRAPH AT	SB-G4	172.	4.42	41.	10.	10.	.23		
+	3 COMBINED AT	CPG4	1257.	5.42	449.	167.	161.	9.02		
+	DIVERSION TO	DVG4	887.	5.42	318.	116.	112.	9.02		
+	HYDROGRAPH AT	DV2CP	370.	5.42	131.	51.	49.	9.02		
+	ROUTED TO	RWG4	369.	5.42	131.	51.	49.	9.02	101.41	5.42
+										
+	HYDROGRAPH AT	SB-G5	140.	4.33	33.	8.	8.	.20		
+	2 COMBINED AT	CPG5	411.	5.42	162.	59.	57.	9.22		
+	ROUTED TO	RCG5	409.	5.42	162.	59.	57.	9.22	102.33	5.42
+										
+	HYDROGRAPH AT	RDVG4	887.	5.42	318.	116.	112.	.00		
+	ROUTED TO	RDG4	887.	5.42	318.	116.	112.	.00	100.94	5.42
+										
+	HYDROGRAPH AT	SB-H2	55.	4.25	10.	2.	2.	.06		
+	2 COMBINED AT	CPH2	893.	5.42	327.	119.	114.	.06		
+	ROUTED TO	R-H2	891.	5.42	327.	118.	114.	.06	101.09	5.42
+										
+	HYDROGRAPH AT	RDVG2	121.	5.42	17.	5.	4.	.00		
+	ROUTED TO	RRDG2	120.	5.50	17.	5.	4.	.00	101.44	5.50
+										
+	HYDROGRAPH AT	SB-H1	59.	4.17	10.	2.	2.	.06		
+	2 COMBINED AT	CPH1	123.	5.50	27.	7.	7.	.06		
+	DIVERSION TO	DVPL	68.	5.50	15.	4.	4.	.06		
+	HYDROGRAPH AT	DWPL	55.	5.50	12.	3.	3.	.06		
+	ROUTED TO	RDWPL	54.	5.58	12.	3.	3.	.06	100.73	5.58
+										

+	HYDROGRAPH AT	SB-H3	79.	4.25	13.	3.	3.	.09	
+	3 COMBINED AT	CPH3	946.	5.50	351.	125.	120.	.21	
+	ROUTED TO	R-H3	948.	5.50	351.	125.	120.	.21	103.43 5.50
+	HYDROGRAPH AT-	SB-H4	76.	4.17	15.	4.	4.	.07	
+	3 COMBINED AT	CPH4	1362.	5.50	527.	187.	180.	9.50	
+	ROUTED TO	RCH4	1365.	5.50	527.	187.	180.	9.50	103.52 5.50
+	HYDROGRAPH AT	SB-H5	60.	4.17	10.	2.	2.	.07	
+	2 COMBINED AT	CPH5	1369.	5.50	536.	190.	183.	9.57	
+	DIVERSION TO	DV91S	141.	5.50	9.	2.	2.	9.57	
+	HYDROGRAPH AT	DS91S	1227.	5.50	528.	187.	181.	9.57	
+	ROUTED TO	RRMG	1224.	5.50	527.	187.	180.	9.57	105.57 5.50
+	HYDROGRAPH AT	RDVPL	68.	5.50	15.	4.	4.	.00	
+	ROUTED TO	DVPL	67.	5.58	15.	4.	4.	.00	101.41 5.58
+	HYDROGRAPH AT	SB-H6	201.	4.25	37.	9.	9.	.23	
+	3 COMBINED AT	CPH6	1310.	5.50	577.	200.	193.	9.80	

*** NORMAL END OF HEC-1 ***

APPENDIX L

updated 10/94

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 .38	RATIO 2 .53	RATIO 3 .63	RATIO 4 .78	RATIO 5 .89	RATIO 6 1.00
HYDROGRAPH AT +	SB-A1	.12	1	FLOW	2.	6.	18.	39.	56.	72.
				TIME	4.33	4.33	4.33	4.33	4.33	4.33
ROUTED TO +	R-A1	.12	1	FLOW	1.	3.	9.	27.	44.	59.
				TIME	5.17	5.08	5.08	4.83	4.75	4.75
			** PEAK STAGES IN FEET **							
			1	STAGE	100.01	100.03	100.10	100.20	100.26	100.31
				TIME	5.17	5.17	5.08	4.83	4.75	4.75
HYDROGRAPH AT +	SB-A2	.20	1	FLOW	3.	7.	19.	42.	61.	79.
				TIME	4.67	4.58	4.67	4.67	4.67	4.67
2 COMBINED AT +	CPA2	.32	1	FLOW	4.	10.	26.	68.	104.	139.
				TIME	4.75	4.83	4.83	4.75	4.67	4.67
ROUTED TO +	R-A2	.32	1	FLOW	3.	8.	23.	61.	95.	129.
				TIME	5.83	5.92	5.42	5.17	5.08	5.00
			** PEAK STAGES IN FEET **							
			1	STAGE	100.03	100.08	100.17	100.31	100.40	100.47
				TIME	5.83	5.92	5.42	5.17	5.08	5.00
HYDROGRAPH AT +	SB-A3	.17	1	FLOW	1.	5.	16.	37.	54.	71.
				TIME	4.83	4.75	4.75	4.75	4.75	4.75
2 COMBINED AT +	CPA3	.50	1	FLOW	4.	9.	32.	90.	143.	196.
				TIME	5.67	5.67	5.25	5.08	5.00	4.92
ROUTED TO +	R-A3	.50	1	FLOW	3.	8.	29.	84.	134.	185.
				TIME	6.50	6.50	5.75	5.33	5.25	5.17
			** PEAK STAGES IN FEET **							
			1	STAGE	100.04	100.09	100.20	100.38	100.50	100.61
				TIME	6.58	6.50	5.75	5.33	5.25	5.17
HYDROGRAPH AT +	SB-A4	.14	1	FLOW	1.	10.	26.	51.	71.	89.
				TIME	4.58	4.50	4.58	4.58	4.58	4.58
2 COMBINED AT +	CPA4	.64	1	FLOW	4.	12.	33.	99.	163.	230.
				TIME	6.42	4.58	5.58	5.25	5.17	5.08
ROUTED TO +	R-A4	.64	1	FLOW	3.	8.	32.	93.	155.	218.
				TIME	7.58	7.25	6.00	5.67	5.42	5.33
			** PEAK STAGES IN FEET **							
			1	STAGE	100.04	100.10	100.22	100.42	100.56	100.68
				TIME	7.58	7.25	6.08	5.67	5.42	5.33
HYDROGRAPH AT +	SB-A5	.09	1	FLOW	0.	3.	9.	17.	24.	30.
				TIME	4.92	4.83	4.92	4.83	4.92	4.92
2 COMBINED AT +	CPA5	.73	1	FLOW	3.	9.	36.	104.	173.	243.
				TIME	7.50	6.67	6.00	5.58	5.42	5.33
HYDROGRAPH AT +	SB-A6	.09	1	FLOW	1.	6.	15.	29.	40.	51.
				TIME	4.42	4.42	4.42	4.42	4.42	4.42
ROUTED TO +	R-A6	.09	1	FLOW	0.	3.	8.	19.	28.	38.
				TIME	5.00	5.00	5.00	4.83	4.83	4.83
			** PEAK STAGES IN FEET **							
			1	STAGE	100.01	100.04	100.09	100.16	100.21	100.24
				TIME	5.00	5.00	5.00	4.83	4.83	4.83
HYDROGRAPH AT +	SB-A7	.08	1	FLOW	1.	10.	19.	31.	41.	50.
				TIME	4.58	4.58	4.58	4.58	4.58	4.58
3 COMBINED AT +	CPA7	.90	1	FLOW	3.	17.	45.	126.	210.	294.
				TIME	7.42	4.75	5.25	5.50	5.33	5.25
HYDROGRAPH AT +	SB-B1	.09	1	FLOW	1.	19.	34.	55.	71.	86.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
ROUTED TO +	R-B1	.09	1	FLOW	0.	13.	28.	48.	64.	79.
				TIME	4.42	4.42	4.33	4.33	4.25	4.25
			** PEAK STAGES IN FEET **							
			1	STAGE	100.01	100.17	100.27	100.38	100.45	100.51
				TIME	4.42	4.42	4.33	4.33	4.25	4.25

HYDROGRAPH AT										
+	SB-B2	.16	1	FLOW	2.	32.	57.	93.	119.	145.
				TIME	4.25	4.25	4.25	4.25	4.25	4.25
2 COMBINED AT										
+	CPB2	.25	1	FLOW	3.	42.	83.	141.	184.	224.
				TIME	4.25	4.25	4.25	4.25	4.25	4.25
ROUTED TO										
+	R-B2	.25	1	FLOW	3.	40.	81.	137.	180.	221.
				TIME	4.42	4.33	4.33	4.33	4.25	4.25
			** PEAK STAGES IN FEET **							
			1	STAGE	100.03	100.26	100.40	100.54	100.63	100.71
				TIME	4.42	4.33	4.33	4.33	4.25	4.25
HYDROGRAPH AT										
+	SB-B3	.12	1	FLOW	4.	9.	18.	31.	42.	53.
				TIME	4.92	4.92	4.92	4.92	4.92	4.92
2 COMBINED AT										
+	CPB3	.37	1	FLOW	6.	44.	87.	149.	196.	240.
				TIME	4.75	4.42	4.33	4.33	4.33	4.33
ROUTED TO										
+	R-B3	.37	1	FLOW	4.	29.	66.	126.	174.	217.
				TIME	5.75	5.08	4.83	4.75	4.67	4.67
			** PEAK STAGES IN FEET **							
			1	STAGE	100.03	100.15	100.26	100.38	100.46	100.52
				TIME	5.75	5.08	4.83	4.75	4.67	4.67
HYDROGRAPH AT										
+	SB-B4	.32	1	FLOW	2.	13.	33.	68.	95.	121.
				TIME	5.17	5.08	5.08	5.08	5.08	5.08
2 COMBINED AT										
+	CPB4	.69	1	FLOW	6.	42.	95.	178.	241.	301.
				TIME	5.58	5.08	4.92	4.83	4.83	4.83
DIVERSION TO										
+	DB4	.69	1	FLOW	3.	21.	48.	89.	120.	151.
				TIME	5.58	5.08	4.92	4.83	4.83	4.83
HYDROGRAPH AT										
+	D-B4	.69	1	FLOW	3.	21.	48.	89.	120.	151.
				TIME	5.58	5.08	4.92	4.83	4.83	4.83
ROUTED TO										
+	R-B4	.69	1	FLOW	2.	11.	29.	65.	94.	123.
				TIME	7.17	6.33	5.83	5.50	5.42	5.33
			** PEAK STAGES IN FEET **							
			1	STAGE	100.02	100.11	100.21	100.34	100.42	100.49
				TIME	7.17	6.33	5.83	5.50	5.42	5.33
HYDROGRAPH AT										
+	SB-B5	.11	1	FLOW	1.	2.	8.	19.	29.	39.
				TIME	4.92	4.83	4.83	4.83	4.83	4.83
ROUTED TO										
+	R-B5	.11	1	FLOW	0.	1.	5.	13.	22.	30.
				TIME	5.58	5.50	5.50	5.42	5.25	5.25
			** PEAK STAGES IN FEET **							
			1	STAGE	100.01	100.02	100.05	100.12	100.17	100.21
				TIME	5.58	5.50	5.50	5.42	5.25	5.25
HYDROGRAPH AT										
+	SB-B6	.16	1	FLOW	1.	11.	29.	58.	80.	102.
				TIME	4.50	4.50	4.50	4.50	4.50	4.50
2 COMBINED AT										
+	CPB6	.27	1	FLOW	2.	11.	30.	60.	85.	109.
				TIME	4.58	4.50	4.50	4.50	4.50	4.50
ROUTED TO										
+	R-B6	.27	1	FLOW	1.	4.	13.	35.	57.	80.
				TIME	6.08	5.92	5.58	5.33	5.25	5.17
			** PEAK STAGES IN FEET **							
			1	STAGE	100.01	100.04	100.12	100.23	100.31	100.38
				TIME	6.08	5.92	5.58	5.33	5.25	5.17
HYDROGRAPH AT										
+	SB-B7	.67	1	FLOW	5.	54.	118.	220.	299.	372.
				TIME	4.25	4.17	4.17	4.25	4.25	4.25
4 COMBINED AT										
+	CPB7	2.53	1	FLOW	7.	59.	138.	275.	442.	614.
				TIME	4.50	4.33	4.33	5.33	5.25	5.17
ROUTED TO										
+	RWBW1	2.53	1	FLOW	6.	45.	118.	269.	432.	601.
				TIME	7.42	5.17	4.92	5.58	5.50	5.42
			** PEAK STAGES IN FEET **							
			1	STAGE	100.03	100.22	100.37	100.60	100.77	100.91
				TIME	7.42	5.17	4.92	5.58	5.50	5.42
HYDROGRAPH AT										
+	WBW	1.00	1	FLOW	98.	207.	296.	424.	522.	618.
				TIME	4.83	4.83	4.83	4.83	4.83	4.83
2 COMBINED AT										
+	CWBW	3.53	1	FLOW	103.	245.	412.	664.	880.	1108.
				TIME	4.83	4.92	4.83	4.83	4.92	5.08

ROUTED TO +	RBWB	3.53	1	FLOW	9.	20.	25.	25.	25.	25.
				TIME	8.42	8.92	6.08	5.17	5.00	4.83
			** PEAK STAGES IN FEET **							
			1	STAGE	26.36	26.78	27.34	28.34	29.17	30.00
				TIME	8.50	8.92	9.25	9.83	10.17	10.33
ROUTED TO +	RRBOF	3.53	1	FLOW	9.	20.	25.	25.	25.	25.
				TIME	8.67	9.08	7.92	7.00	6.83	7.00
			** PEAK STAGES IN FEET **							
			1	STAGE	100.11	100.17	100.20	100.20	100.20	100.20
				TIME	8.75	9.17	8.00	7.33	7.17	7.08
HYDROGRAPH AT +	SB-C1	.10	1	FLOW	2.	9.	20.	39.	53.	67.
				TIME	4.25	4.25	4.25	4.25	4.25	4.25
ROUTED TO +	R-C1	.10	1	FLOW	2.	6.	17.	35.	50.	64.
				TIME	4.92	4.92	4.67	4.50	4.50	4.50
			** PEAK STAGES IN FEET **							
			1	STAGE	100.02	100.07	100.15	100.24	100.29	100.34
				TIME	4.92	4.92	4.67	4.50	4.50	4.50
HYDROGRAPH AT +	SB-C2	.19	1	FLOW	14.	56.	87.	130.	162.	193.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
2 COMBINED AT +	CPC2	.29	1	FLOW	14.	58.	90.	140.	185.	230.
				TIME	4.17	4.17	4.17	4.25	4.33	4.25
DIVERSION TO +	DC2	.29	1	FLOW	3.	7.	9.	14.	19.	23.
				TIME	4.17	4.17	4.17	4.25	4.33	4.25
HYDROGRAPH AT +	D-C2	.29	1	FLOW	11.	51.	81.	126.	167.	207.
				TIME	4.17	4.17	4.17	4.25	4.33	4.25
ROUTED TO +	R-C2	.29	1	FLOW	7.	44.	75.	123.	164.	202.
				TIME	4.67	4.42	4.33	4.42	4.42	4.33
			** PEAK STAGES IN FEET **							
			1	STAGE	100.09	100.29	100.40	100.54	100.64	100.73
				TIME	4.67	4.42	4.33	4.42	4.42	4.33
HYDROGRAPH AT +	C3	.04	1	FLOW	4.	11.	17.	24.	30.	36.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
2 COMBINED AT +	CPC3	.33	1	FLOW	10.	54.	91.	146.	192.	237.
				TIME	4.58	4.42	4.33	4.33	4.33	4.33
ROUTED TO +	R-C3	.33	1	FLOW	8.	49.	87.	143.	188.	233.
				TIME	5.08	4.58	4.50	4.50	4.50	4.42
			** PEAK STAGES IN FEET **							
			1	STAGE	100.10	100.31	100.44	100.59	100.70	100.79
				TIME	5.08	4.58	4.50	4.50	4.50	4.42
HYDROGRAPH AT +	SB-C4	.07	1	FLOW	6.	17.	25.	36.	45.	53.
				TIME	4.25	4.33	4.33	4.33	4.33	4.33
2 COMBINED AT +	CPC4A	.40	1	FLOW	11.	63.	109.	176.	232.	285.
				TIME	4.83	4.58	4.50	4.42	4.42	4.42
HYDROGRAPH AT +	DB4	.00	1	FLOW	3.	21.	48.	89.	120.	151.
				TIME	5.58	5.08	4.92	4.83	4.83	4.83
2 COMBINED AT +	CPC4	.40	1	FLOW	13.	70.	132.	240.	324.	402.
				TIME	4.92	4.67	4.67	4.58	4.58	4.50
ROUTED TO +	R-C4	.40	1	FLOW	12.	65.	127.	233.	318.	395.
				TIME	5.58	5.08	4.92	4.83	4.75	4.75
			** PEAK STAGES IN FEET **							
			1	STAGE	100.14	100.38	100.57	100.82	100.99	101.12
				TIME	5.58	5.08	4.92	4.83	4.75	4.75
HYDROGRAPH AT +	SB-C5	.12	1	FLOW	14.	31.	43.	61.	75.	88.
				TIME	4.42	4.42	4.42	4.42	4.42	4.42
2 COMBINED AT +	CPC5	.52	1	FLOW	18.	84.	156.	279.	377.	471.
				TIME	5.33	5.00	4.83	4.75	4.75	4.67
DIVERSION TO +	DC5	.52	1	FLOW	5.	25.	47.	84.	113.	141.
				TIME	5.33	5.00	4.83	4.75	4.75	4.67
HYDROGRAPH AT +	D-C5	.52	1	FLOW	13.	58.	109.	196.	264.	330.
				TIME	5.33	5.00	4.83	4.75	4.75	4.67

HYDROGRAPH AT +	WB-P8B	.01	1	FLOW	2.	4.	6.	8.	9.	11.
				TIME	4.08	4.00	4.00	4.00	4.00	4.00
2 COMBINED AT +	CP5B	.53	1	FLOW	13.	59.	110.	197.	265.	332.
				TIME	5.33	5.00	4.83	4.75	4.75	4.67
ROUTED TO +	R-5B	.53	1	FLOW	12.	56.	105.	190.	258.	322.
				TIME	5.58	5.17	5.00	4.92	4.83	4.75
			** PEAK STAGES IN FEET **							
			1	STAGE	100.25	100.57	100.79	101.05	101.22	101.35
				TIME	5.58	5.17	5.00	4.92	4.83	4.75
HYDROGRAPH AT +	WB9	.28	1	FLOW	70.	133.	177.	237.	284.	328.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08
ROUTED TO +	R-R10	.28	1	FLOW	16.	20.	22.	30.	36.	43.
				TIME	5.08	5.17	5.17	5.17	5.17	5.17
			** PEAK STAGES IN FEET **							
			1	STAGE	30.12	30.90	31.41	31.85	32.16	32.46
				TIME	5.08	5.17	5.25	5.17	5.17	5.17
2 COMBINED AT +	91ST	.81	1	FLOW	28.	76.	127.	219.	293.	363.
				TIME	5.50	5.17	5.00	4.92	4.83	4.83
HYDROGRAPH AT +	SB-D1	.13	1	FLOW	1.	6.	23.	53.	76.	99.
				TIME	4.08	4.17	4.17	4.17	4.17	4.17
ROUTED TO +	R-D1	.13	1	FLOW	1.	4.	19.	50.	74.	97.
				TIME	4.33	4.42	4.33	4.25	4.25	4.25
			** PEAK STAGES IN FEET **							
			1	STAGE	100.02	100.06	100.21	100.37	100.46	100.52
				TIME	4.33	4.42	4.33	4.25	4.25	4.25
HYDROGRAPH AT +	SB-D2	.07	1	FLOW	0.	1.	5.	13.	21.	27.
				TIME	4.50	4.42	4.42	4.50	4.50	4.50
2 COMBINED AT +	CPD2	.20	1	FLOW	2.	6.	24.	62.	92.	121.
				TIME	4.42	4.42	4.33	4.25	4.25	4.25
DIVERSION TO +	DD2	.20	1	FLOW	2.	6.	24.	62.	92.	121.
				TIME	4.42	4.42	4.33	4.25	4.25	4.25
HYDROGRAPH AT +	DVD2	.20	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
ROUTED TO +	R-D2	.20	1	FLOW	0.	0.	0.	0.	0.	0.
				TIME	.08	.08	.08	.08	.08	.08
			** PEAK STAGES IN FEET **							
			1	STAGE	100.00	100.00	100.00	100.00	100.00	100.00
				TIME	.00	.00	.00	.00	.00	.00
HYDROGRAPH AT +	SB-D3	.11	1	FLOW	5.	23.	38.	60.	76.	92.
				TIME	4.25	4.33	4.33	4.33	4.33	4.33
2 COMBINED AT +	CPD3	.32	1	FLOW	5.	23.	38.	60.	76.	92.
				TIME	4.25	4.33	4.33	4.33	4.33	4.33
ROUTED TO +	R-D3	.32	1	FLOW	4.	21.	36.	58.	75.	90.
				TIME	4.75	4.58	4.50	4.42	4.42	4.42
			** PEAK STAGES IN FEET **							
			1	STAGE	100.07	100.22	100.30	100.40	100.46	100.52
				TIME	4.75	4.58	4.50	4.42	4.42	4.42
HYDROGRAPH AT +	SB-D4	.12	1	FLOW	8.	27.	43.	66.	83.	99.
				TIME	4.25	4.33	4.33	4.33	4.33	4.33
2 COMBINED AT +	CPD4	.44	1	FLOW	11.	44.	77.	121.	155.	187.
				TIME	4.42	4.50	4.42	4.42	4.42	4.42
ROUTED TO +	R-D4	.44	1	FLOW	11.	41.	71.	117.	151.	183.
				TIME	4.67	4.58	4.58	4.50	4.50	4.50
			** PEAK STAGES IN FEET **							
			1	STAGE	100.38	100.82	101.10	101.39	101.57	101.73
				TIME	4.67	4.58	4.58	4.50	4.50	4.50
HYDROGRAPH AT +	SB-D5	.19	1	FLOW	41.	82.	108.	144.	172.	198.
				TIME	4.42	4.42	4.42	4.33	4.33	4.33
2 COMBINED AT +	CPD5	.63	1	FLOW	50.	118.	176.	257.	319.	378.
				TIME	4.50	4.50	4.50	4.42	4.42	4.42

ROUTED TO										
+	R-D5	.63	1	FLOW	45.	112.	169.	249.	311.	369.
				TIME	4.75	4.67	4.67	4.58	4.58	4.58
			** PEAK STAGES IN FEET **							
			1	STAGE	100.23	100.39	100.49	100.62	100.71	100.78
				TIME	4.75	4.67	4.67	4.58	4.58	4.58
HYDROGRAPH AT										
+	SB-D6_	.14	1	FLOW	40.	72.	92.	119.	141.	161.
				TIME	4.42	4.42	4.33	4.33	4.33	4.33
2 COMBINED AT										
+	CPD6	.77	1	FLOW	78.	175.	251.	358.	440.	520.
				TIME	4.67	4.58	4.58	4.58	4.50	4.50
ROUTED TO										
+	R-D6	.77	1	FLOW	67.	161.	234.	339.	420.	498.
				TIME	4.92	4.75	4.75	4.67	4.67	4.67
			** PEAK STAGES IN FEET **							
			1	STAGE	100.29	100.49	100.61	100.76	100.86	100.94
				TIME	4.92	4.75	4.75	4.67	4.67	4.67
HYDROGRAPH AT										
+	SB-D7	.15	1	FLOW	4.	20.	44.	79.	107.	132.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
ROUTED TO										
+	R-D7	.15	1	FLOW	3.	14.	38.	75.	102.	127.
				TIME	4.58	4.50	4.42	4.33	4.33	4.25
			** PEAK STAGES IN FEET **							
			1	STAGE	100.04	100.17	100.31	100.46	100.56	100.64
				TIME	4.58	4.50	4.42	4.33	4.33	4.25
HYDROGRAPH AT										
+	SB-D93	.15	1	FLOW	14.	47.	71.	103.	128.	152.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
2 COMBINED AT										
+	CPD9	.30	1	FLOW	17.	52.	99.	170.	224.	273.
				TIME	4.17	4.25	4.33	4.25	4.25	4.25
DIVERSION TO										
+	D93E	.30	1	FLOW	5.	16.	30.	51.	67.	82.
				TIME	4.17	4.25	4.33	4.25	4.25	4.25
HYDROGRAPH AT										
+	D93E	.30	1	FLOW	12.	36.	69.	119.	157.	191.
				TIME	4.17	4.25	4.33	4.25	4.25	4.25
ROUTED TO										
+	RD93	.30	1	FLOW	9.	32.	62.	111.	149.	183.
				TIME	4.50	4.50	4.42	4.42	4.33	4.33
			** PEAK STAGES IN FEET **							
			1	STAGE	100.11	100.27	100.41	100.58	100.70	100.79
				TIME	4.50	4.50	4.42	4.42	4.33	4.33
HYDROGRAPH AT										
+	DC2	.00	1	FLOW	3.	7.	9.	14.	19.	23.
				TIME	4.17	4.17	4.17	4.25	4.33	4.25
HYDROGRAPH AT										
+	SB-D9	.31	1	FLOW	24.	75.	116.	171.	214.	255.
				TIME	4.25	4.33	4.33	4.33	4.33	4.33
HYDROGRAPH AT										
+	RD93E	.00	1	FLOW	5.	16.	30.	51.	67.	82.
				TIME	4.17	4.25	4.33	4.25	4.25	4.25
HYDROGRAPH AT										
+	SB-D10	.08	1	FLOW	9.	23.	33.	47.	58.	68.
				TIME	4.25	4.25	4.25	4.25	4.25	4.25
5 COMBINED AT										
+	CPD10	.69	1	FLOW	48.	150.	246.	391.	503.	607.
				TIME	4.25	4.33	4.33	4.33	4.33	4.33
ROUTED TO										
+	R-D10	.69	1	FLOW	47.	148.	242.	387.	497.	603.
				TIME	4.50	4.42	4.42	4.42	4.42	4.33
			** PEAK STAGES IN FEET **							
			1	STAGE	100.37	100.74	101.00	101.33	101.54	101.73
				TIME	4.50	4.42	4.42	4.42	4.42	4.33
HYDROGRAPH AT										
+	SB-D11	.08	1	FLOW	9.	24.	34.	48.	59.	69.
				TIME	4.25	4.25	4.25	4.25	4.25	4.25
2 COMBINED AT										
+	CPD11	.77	1	FLOW	54.	170.	274.	433.	554.	672.
				TIME	4.42	4.42	4.42	4.42	4.33	4.33
ROUTED TO										
+	R-D11	.77	1	FLOW	32.	108.	184.	309.	411.	514.
				TIME	5.17	4.83	4.75	4.75	4.67	4.67
			** PEAK STAGES IN FEET **							
			1	STAGE	100.23	100.46	100.63	100.85	100.99	101.12
				TIME	5.17	4.83	4.75	4.75	4.67	4.67
HYDROGRAPH AT										
+	SB-D12	.18	1	FLOW	3.	20.	34.	54.	70.	86.
				TIME	4.75	4.75	4.75	4.83	4.83	4.83

HYDROGRAPH AT +	DC5	.00	1	FLOW	5.	25.	47.	84.	113.	141.
				TIME	5.33	5.00	4.83	4.75	4.75	4.67
4 COMBINED AT +	WBE1	1.72	1	FLOW	105.	311.	498.	784.	1012.	1236.
				TIME	4.92	4.83	4.75	4.75	4.67	4.67
ROUTED TO +	R-WBE1	1.72	1	FLOW	105.	311.	497.	785.	1010.	1235.
				TIME	4.92	4.83	4.75	4.75	4.67	4.67
			** PEAK STAGES IN FEET **							
			1	STAGE	41.28	42.37	43.07	43.93	44.48	44.97
				TIME	4.92	4.83	4.75	4.75	4.67	4.67
HYDROGRAPH AT +	WB1	.12	1	FLOW	35.	66.	86.	112.	133.	153.
				TIME	4.25	4.25	4.25	4.17	4.17	4.17
2 COMBINED AT +	CPWB1	1.84	1	FLOW	116.	334.	536.	840.	1084.	1321.
				TIME	4.83	4.83	4.75	4.67	4.67	4.67
ROUTED TO +	R-R3	1.84	1	FLOW	100.	328.	527.	817.	970.	1148.
				TIME	5.25	4.92	4.83	4.83	4.92	4.92
			** PEAK STAGES IN FEET **							
			1	STAGE	35.46	36.22	36.54	37.01	37.41	37.87
				TIME	5.25	4.92	4.83	4.83	4.92	4.92
HYDROGRAPH AT +	WB2	.10	1	FLOW	27.	46.	58.	75.	88.	101.
				TIME	4.58	4.50	4.50	4.50	4.50	4.50
2 COMBINED AT +	CPWB2	1.94	1	FLOW	114.	364.	576.	884.	1039.	1226.
				TIME	5.17	4.92	4.83	4.75	4.92	4.92
ROUTED TO +	R-4-5	1.94	1	FLOW	19.	42.	272.	717.	1004.	1207.
				TIME	7.58	7.33	5.67	5.17	5.08	5.00
			** PEAK STAGES IN FEET **							
			1	STAGE	30.20	35.06	35.69	36.40	36.75	37.00
				TIME	7.67	7.33	5.67	5.17	5.08	5.00
HYDROGRAPH AT +	WB3	.01	1	FLOW	3.	7.	9.	12.	14.	17.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08
2 COMBINED AT +	CPWB3	1.96	1	FLOW	19.	42.	272.	718.	1006.	1209.
				TIME	7.58	7.33	5.67	5.17	5.08	5.00
ROUTED TO +	R-6	1.96	1	FLOW	19.	41.	267.	710.	993.	1198.
				TIME	7.75	7.42	5.75	5.17	5.17	5.08
			** PEAK STAGES IN FEET **							
			1	STAGE	34.09	34.18	35.07	35.83	36.47	36.99
				TIME	7.75	7.42	5.75	5.17	5.17	5.08
HYDROGRAPH AT +	SB-F1	.11	1	FLOW	0.	7.	22.	46.	64.	82.
				TIME	.08	4.25	4.25	4.25	4.25	4.25
HYDROGRAPH AT +	QINP	.17	1	FLOW	176.	176.	176.	176.	176.	176.
				TIME	.58	.58	.58	.58	.58	.58
2 COMBINED AT +	CIQF	.28	1	FLOW	176.	176.	176.	176.	176.	176.
				TIME	.58	.58	.58	.58	.58	.58
ROUTED TO +	RCIQF	.28	1	FLOW	160.	160.	160.	160.	160.	160.
				TIME	.67	.67	.67	.67	.67	.67
			** PEAK STAGES IN FEET **							
			1	STAGE	100.72	100.72	100.72	100.72	100.72	100.72
				TIME	.67	.67	.67	.67	.67	.67
HYDROGRAPH AT +	SB-F2	.10	1	FLOW	1.	14.	26.	43.	57.	69.
				TIME	4.33	4.42	4.42	4.42	4.42	4.42
2 COMBINED AT +	CPF2	.39	1	FLOW	160.	160.	160.	160.	160.	160.
				TIME	.67	.67	.67	.67	.67	.67
ROUTED TO +	R-F2	.39	1	FLOW	138.	138.	138.	138.	138.	142.
				TIME	.75	.75	.75	.75	.75	4.50
			** PEAK STAGES IN FEET **							
			1	STAGE	100.72	100.72	100.72	100.72	100.72	100.73
				TIME	.75	.75	.75	.75	.75	4.50
HYDROGRAPH AT +	SB-F3	.18	1	FLOW	47.	80.	100.	128.	150.	170.
				TIME	4.50	4.50	4.50	4.50	4.50	4.50
2 COMBINED AT +	CPF3	.57	1	FLOW	139.	139.	139.	206.	261.	312.
				TIME	.75	.75	.75	4.50	4.50	4.50

ROUTED TO +	R-F3	.57	1	FLOW	110.	110.	133.	201.	254.	305.
				TIME	.92	.92	4.67	4.67	4.58	4.58
			** PEAK STAGES IN FEET **							
			1	STAGE	100.65	100.65	100.73	100.93	101.06	101.18
				TIME	.92	.92	4.67	4.67	4.58	4.58
HYDROGRAPH AT +	SB-F4	.14	1	FLOW	32.	61.	80.	105.	125.	144.
				TIME	4.42	4.42	4.42	4.33	4.33	4.33
2 COMBINED AT +	CPF4	.70	1	FLOW	110.	144.	203.	295.	368.	436.
				TIME	.92	4.58	4.58	4.58	4.58	4.50
ROUTED TO +	R-F4	.70	1	FLOW	106.	142.	200.	293.	365.	434.
				TIME	1.08	4.67	4.67	4.67	4.67	4.58
			** PEAK STAGES IN FEET **							
			1	STAGE	100.66	100.78	100.96	101.20	101.37	101.52
				TIME	1.08	4.67	4.67	4.67	4.67	4.58
HYDROGRAPH AT +	SB-F5	.06	1	FLOW	1.	9.	16.	27.	35.	42.
				TIME	4.42	4.42	4.42	4.42	4.42	4.42
2 COMBINED AT +	CPF5	.76	1	FLOW	106.	149.	214.	316.	396.	474.
				TIME	1.08	4.67	4.67	4.67	4.58	4.58
HYDROGRAPH AT +	SB-E1	.10	1	FLOW	1.	5.	15.	33.	47.	61.
				TIME	4.33	4.33	4.33	4.33	4.33	4.33
HYDROGRAPH AT +	RD2	.00	1	FLOW	2.	6.	24.	62.	92.	121.
				TIME	4.42	4.42	4.33	4.25	4.25	4.25
2 COMBINED AT +	CED2	.10	1	FLOW	3.	10.	39.	94.	138.	179.
				TIME	4.33	4.33	4.33	4.33	4.33	4.25
DIVERSION TO +	DVCL	.10	1	FLOW	3.	10.	39.	94.	137.	137.
				TIME	4.33	4.33	4.33	4.33	4.33	4.17
HYDROGRAPH AT +	DCLE	.10	1	FLOW	0.	0.	0.	0.	1.	42.
				TIME	.08	.08	.08	.08	4.33	4.25
ROUTED TO +	RED	.10	1	FLOW	0.	0.	0.	0.	0.	15.
				TIME	.08	.08	.08	.08	4.67	4.67
			** PEAK STAGES IN FEET **							
			1	STAGE	100.00	100.00	100.00	100.00	100.00	100.12
				TIME	.00	.00	.00	.00	4.75	4.67
HYDROGRAPH AT +	SB-E2	.15	1	FLOW	1.	22.	40.	66.	86.	105.
				TIME	4.58	4.58	4.58	4.58	4.58	4.58
2 COMBINED AT +	CPE2	.25	1	FLOW	1.	22.	40.	66.	86.	120.
				TIME	4.58	4.58	4.58	4.58	4.58	4.58
ROUTED TO +	R-E2	.25	1	FLOW	1.	15.	31.	57.	78.	110.
				TIME	5.25	5.08	5.00	4.92	4.83	4.83
			** PEAK STAGES IN FEET **							
			1	STAGE	100.01	100.13	100.21	100.30	100.36	100.44
				TIME	5.25	5.08	5.00	4.92	4.83	4.83
HYDROGRAPH AT +	SB-E3	.14	1	FLOW	10.	33.	53.	82.	105.	126.
				TIME	4.25	4.33	4.33	4.25	4.25	4.25
2 COMBINED AT +	CPE3	.39	1	FLOW	10.	34.	57.	102.	138.	184.
				TIME	4.25	4.33	4.42	4.67	4.67	4.67
ROUTED TO +	R-E3	.39	1	FLOW	8.	30.	54.	99.	136.	180.
				TIME	4.58	4.58	4.75	4.75	4.75	4.75
			** PEAK STAGES IN FEET **							
			1	STAGE	100.14	100.30	100.43	100.62	100.74	100.87
				TIME	4.58	4.58	4.75	4.75	4.75	4.75
HYDROGRAPH AT +	SB-E4	.10	1	FLOW	32.	53.	67.	86.	100.	114.
				TIME	4.42	4.42	4.33	4.33	4.33	4.33
2 COMBINED AT +	CPE4	.49	1	FLOW	40.	81.	117.	173.	221.	272.
				TIME	4.50	4.50	4.50	4.50	4.58	4.58
ROUTED TO +	R-E4	.49	1	FLOW	33.	73.	109.	167.	214.	266.
				TIME	4.92	4.75	4.75	4.75	4.75	4.83
			** PEAK STAGES IN FEET **							
			1	STAGE	100.24	100.38	100.48	100.62	100.71	100.81
				TIME	4.92	4.75	4.75	4.75	4.75	4.83

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HYDROGRAPH AT
+                SB-E5      .11   1  FLOW          26.     49.     64.     85.    101.    115.
                                     TIME        4.42    4.42    4.42    4.33    4.33    4.33

 2 COMBINED AT
+                CPE5       .60   1  FLOW          51.    112.    161.    235.    294.    355.
                                     TIME        4.75    4.67    4.67    4.67    4.67    4.67

ROUTED TO
+                R-E5       .60   1  FLOW          42.     98.    145.    217.    275.    336.
                                     TIME        5.08    4.92    4.92    4.92    4.83    4.92

                                  ** PEAK STAGES IN FEET **
                                  1  STAGE      100.31  100.51  100.64  100.79  100.90  101.00
                                     TIME        5.08    4.92    4.92    4.92    4.83    4.92

 2 COMBINED AT
+                CPF5      1.36   1  FLOW         109.    239.    348.    518.    651.    783.
                                     TIME        4.83    4.75    4.75    4.75    4.67    4.67

ROUTED TO
+                R-F5      1.36   1  FLOW         101.    228.    335.    500.    632.    761.
                                     TIME        5.08    4.92    4.92    4.83    4.83    4.83

                                  ** PEAK STAGES IN FEET **
                                  1  STAGE      100.97  101.38  101.64  101.96  102.18  102.37
                                     TIME        5.08    4.92    4.92    4.83    4.83    4.83

HYDROGRAPH AT
+                SB-F6      .03   1  FLOW          12.     20.     24.     31.     36.     41.
                                     TIME        4.33    4.25    4.25    4.25    4.25    4.25

 2 COMBINED AT
+                CPF6      1.39   1  FLOW         105.    237.    346.    516.    650.    782.
                                     TIME        5.08    4.92    4.92    4.83    4.83    4.83

DIVERSION TO
+                DV83      1.39   1  FLOW          74.    166.    242.    361.    455.    547.
                                     TIME        5.08    4.92    4.92    4.83    4.83    4.83

HYDROGRAPH AT
+                DVER      1.39   1  FLOW          32.     71.    104.    155.    195.    235.
                                     TIME        5.08    4.92    4.92    4.83    4.83    4.83

ROUTED TO
+                R-F6      1.39   1  FLOW          30.     68.    100.    151.    191.    230.
                                     TIME        5.25    5.08    5.08    5.00    4.92    4.92

                                  ** PEAK STAGES IN FEET **
                                  1  STAGE      100.53  100.82  100.99  101.18  101.30  101.42
                                     TIME        5.25    5.08    5.08    5.00    4.92    4.92

HYDROGRAPH AT
+                SB-F7      .36   1  FLOW          85.    165.    215.    284.    337.    387.
                                     TIME        4.42    4.42    4.42    4.33    4.33    4.33

 2 COMBINED AT
+                WBE2      1.75   1  FLOW          95.    188.    256.    359.    443.    525.
                                     TIME        4.50    4.50    4.58    4.58    4.58    4.58

HYDROGRAPH AT
+                WB4        .06   1  FLOW          16.     31.     42.     56.     68.     79.
                                     TIME        4.08    4.17    4.17    4.08    4.08    4.08

 2 COMBINED AT
+                CPWB4     1.82   1  FLOW         106.    207.    278.    386.    475.    563.
                                     TIME        4.42    4.42    4.42    4.50    4.58    4.58

ROUTED TO
+                R-R1      1.82   1  FLOW          75.    290.    374.    399.    487.    575.
                                     TIME        5.25    4.50    4.33    4.42    4.50    4.42

                                  ** PEAK STAGES IN FEET **
                                  1  STAGE       43.07   43.36   43.48   43.52   43.64   43.76
                                     TIME        5.25    4.50    4.33    4.42    4.50    4.42

HYDROGRAPH AT
+                WB5        .08   1  FLOW          19.     36.     48.     66.     79.     92.
                                     TIME        4.17    4.17    4.17    4.17    4.17    4.17

 2 COMBINED AT
+                CPWB5     1.90   1  FLOW          79.    314.    417.    452.    553.    650.
                                     TIME        5.25    4.50    4.33    4.42    4.33    4.42

ROUTED TO
+                R-R2      1.90   1  FLOW          19.     21.     72.    308.    458.    581.
                                     TIME       10.08    5.08    5.92    5.08    4.83    4.75

                                  ** PEAK STAGES IN FEET **
                                  1  STAGE       28.99   31.35   33.06   33.32   33.48   33.62
                                     TIME       10.08    9.75    5.92    5.08    4.83    4.75

 2 COMBINED AT
+                CPR6      3.85   1  FLOW          38.     62.    311.    996.   1365.   1658.
                                     TIME        9.83    7.42    5.92    5.17    5.08    5.00

ROUTED TO
+                RCR26     3.85   1  FLOW          38.     59.    292.    909.   1315.   1621.
                                     TIME       10.08    7.67    6.00    5.33    5.25    5.17

                                  ** PEAK STAGES IN FEET **
                                  1  STAGE      100.37  100.48  101.22  102.32  102.83  103.17
                                     TIME       10.08    7.67    6.00    5.33    5.25    5.17

HYDROGRAPH AT
+                WB7        .03   1  FLOW          15.     24.     30.     37.     43.     49.
                                     TIME        4.08    4.08    4.08    4.08    4.08    4.08
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2 COMBINED AT										
+	CR6W7	3.89	1	FLOW	38.	59.	294.	911.	1319.	1627.
				TIME	10.08	7.67	6.00	5.33	5.25	5.17
ROUTED TO										
+	R-R7	3.89	1	FLOW	37.	43.	293.	915.	1318.	1631.
				TIME	11.58	8.75	6.08	5.33	5.25	5.17
			** PEAK STAGES IN FEET **							
			1	STAGE	30.17	30.75	31.51	32.45	32.92	33.22
				TIME	11.58	8.75	6.08	5.33	5.25	5.17
HYDROGRAPH AT										
+	WB6	.08	1	FLOW	28.	47.	60.	76.	90.	102.
				TIME	4.33	4.33	4.25	4.25	4.25	4.25
ROUTED TO										
+	R-R8	.08	1	FLOW	9.	14.	15.	18.	19.	20.
				TIME	5.00	5.08	5.17	5.25	5.25	5.33
			** PEAK STAGES IN FEET **							
			1	STAGE	28.73	29.22	29.49	29.88	30.13	30.34
				TIME	5.00	5.08	5.17	5.25	5.25	5.33
2 COMBINED AT										
+	C7R8	3.97	1	FLOW	38.	48.	307.	933.	1337.	1651.
				TIME	11.08	8.25	6.08	5.33	5.25	5.17
ROUTED TO										
+	RC78	3.97	1	FLOW	38.	48.	304.	919.	1343.	1643.
				TIME	11.17	8.33	6.08	5.33	5.25	5.17
			** PEAK STAGES IN FEET **							
			1	STAGE	100.27	100.31	100.95	101.81	102.26	102.53
				TIME	11.17	8.33	6.08	5.33	5.25	5.17
HYDROGRAPH AT										
+	WB8	.03	1	FLOW	16.	25.	31.	39.	45.	51.
				TIME	4.08	4.08	4.08	4.08	4.08	4.08
2 COMBINED AT										
+	CP-678	4.01	1	FLOW	38.	48.	306.	922.	1346.	1648.
				TIME	11.17	8.33	6.08	5.33	5.25	5.17
HYDROGRAPH AT										
+	WB10	.06	1	FLOW	14.	25.	35.	48.	59.	68.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
ROUTED TO										
+	R-R9	.06	1	FLOW	10.	13.	15.	18.	20.	21.
				TIME	4.42	4.58	4.67	4.67	4.75	4.75
			** PEAK STAGES IN FEET **							
			1	STAGE	26.92	27.27	27.59	28.04	28.25	28.46
				TIME	4.42	4.58	4.67	4.67	4.75	4.75
2 COMBINED AT										
+	WBEOT	4.06	1	FLOW	39.	58.	312.	938.	1365.	1668.
				TIME	4.33	4.42	6.08	5.33	5.25	5.17
DIVERSION TO										
+	TONR	4.06	1	FLOW	0.	0.	100.	100.	100.	100.
				TIME	.08	.08	5.83	5.17	4.92	4.75
HYDROGRAPH AT										
+	DVNR	4.06	1	FLOW	39.	58.	212.	838.	1265.	1568.
				TIME	4.33	4.42	6.08	5.33	5.25	5.17
DIVERSION TO										
+	DCLUB	4.06	1	FLOW	0.	0.	31.	180.	280.	350.
				TIME	.08	.08	6.08	5.33	5.25	5.17
HYDROGRAPH AT										
+	CCLUB	4.06	1	FLOW	39.	58.	181.	658.	985.	1218.
				TIME	4.33	4.42	6.08	5.33	5.25	5.17
ROUTED TO										
+	RR287	4.06	1	FLOW	39.	58.	180.	666.	978.	1215.
				TIME	4.42	4.50	6.17	5.33	5.25	5.17
			** PEAK STAGES IN FEET **							
			1	STAGE	100.77	100.89	101.34	102.29	102.74	103.04
				TIME	4.42	4.50	6.17	5.33	5.25	5.17
DIVERSION TO										
+	DV87S	4.06	1	FLOW	0.	0.	32.	190.	288.	361.
				TIME	.08	.08	6.17	5.33	5.25	5.17
HYDROGRAPH AT										
+	DV87S	4.06	1	FLOW	39.	58.	148.	476.	690.	854.
				TIME	4.42	4.50	6.17	5.33	5.25	5.17
ROUTED TO										
+	RR289	4.06	1	FLOW	39.	57.	146.	476.	690.	855.
				TIME	4.50	4.67	6.25	5.42	5.33	5.25
			** PEAK STAGES IN FEET **							
			1	STAGE	100.65	100.74	101.07	101.62	101.89	102.08
				TIME	4.50	4.67	6.25	5.42	5.33	5.25
DIVERSION TO										
+	DV89	4.06	1	FLOW	0.	0.	1.	238.	345.	427.
				TIME	.08	.08	6.25	5.42	5.33	5.25
HYDROGRAPH AT										
+	DS89	4.06	1	FLOW	39.	57.	145.	238.	345.	427.
				TIME	4.50	4.67	6.25	5.42	5.33	5.25

ROUTED TO										
+	RR291	4.06	1	FLOW	38.	57.	142.	226.	340.	423.
				TIME	4.75	4.75	6.33	5.50	5.42	5.33
			** PEAK STAGES IN FEET **							
			1	STAGE	100.76	100.89	101.23	101.45	101.71	101.87
				TIME	4.75	4.75	6.33	5.50	5.42	5.33
2 COMBINED AT										
+	CP91L	4.87	1	FLOW	66.	131.	196.	374.	552.	698.
				TIME	4.75	5.17	6.33	5.50	5.33	5.25
DIVERSION TO										
+	DV91	4.87	1	FLOW	48.	95.	143.	275.	407.	516.
				TIME	4.75	5.17	6.33	5.50	5.33	5.25
HYDROGRAPH AT										
+	DV91	4.87	1	FLOW	18.	36.	53.	99.	145.	182.
				TIME	4.75	5.17	6.33	5.50	5.33	5.25
ROUTED TO										
+	RDV91	4.87	1	FLOW	18.	35.	51.	95.	142.	179.
				TIME	5.00	5.25	6.42	5.58	5.42	5.33
			** PEAK STAGES IN FEET **							
			1	STAGE	100.54	100.71	100.83	101.05	101.19	101.29
				TIME	5.00	5.25	6.42	5.58	5.42	5.33
2 COMBINED AT										
+	CP93	8.40	1	FLOW	23.	44.	76.	119.	166.	204.
				TIME	6.42	5.67	6.42	5.58	5.42	5.33
ROUTED TO										
+	R93RD	8.40	1	FLOW	23.	44.	76.	119.	166.	204.
				TIME	6.50	5.67	6.42	5.58	5.42	5.33
			** PEAK STAGES IN FEET **							
			1	STAGE	100.23	100.34	100.49	100.64	100.79	100.89
				TIME	6.50	5.67	6.42	5.58	5.42	5.33
HYDROGRAPH AT										
+	SB-G6	.03	1	FLOW	2.	8.	13.	20.	25.	30.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
2 COMBINED AT										
+	CPG6	8.43	1	FLOW	23.	44.	76.	119.	168.	206.
				TIME	6.42	5.58	6.42	5.58	5.42	5.33
ROUTED TO										
+	R93G6	8.43	1	FLOW	23.	44.	75.	116.	162.	202.
				TIME	6.67	5.75	6.58	5.75	5.58	5.42
			** PEAK STAGES IN FEET **							
			1	STAGE	101.34	101.80	102.29	102.81	103.29	103.65
				TIME	6.67	5.75	6.58	5.75	5.58	5.42
HYDROGRAPH AT										
+	R91S	.00	1	FLOW	48.	95.	143.	275.	407.	516.
				TIME	4.75	5.17	6.33	5.50	5.33	5.25
ROUTED TO										
+	RDV91	.00	1	FLOW	48.	95.	144.	276.	408.	517.
				TIME	4.75	5.17	6.33	5.50	5.33	5.25
			** PEAK STAGES IN FEET **							
			1	STAGE	100.70	100.91	101.07	101.37	101.59	101.74
				TIME	4.75	5.17	6.33	5.50	5.33	5.25
2 COMBINED AT										
+	CRG6C	8.43	1	FLOW	67.	135.	213.	382.	556.	705.
				TIME	5.25	5.25	6.33	5.50	5.42	5.25
ROUTED TO										
+	RCG691	8.43	1	FLOW	67.	134.	211.	375.	552.	702.
				TIME	5.33	5.33	6.42	5.58	5.42	5.33
			** PEAK STAGES IN FEET **							
			1	STAGE	100.96	101.26	101.49	101.85	102.14	102.30
				TIME	5.33	5.33	6.42	5.58	5.42	5.33
HYDROGRAPH AT										
+	DV87S	.00	1	FLOW	0.	0.	32.	190.	288.	361.
				TIME	.08	.08	6.17	5.33	5.25	5.17
ROUTED TO										
+	RDV87S	.00	1	FLOW	0.	0.	31.	183.	288.	362.
				TIME	.08	.08	6.25	5.42	5.33	5.25
			** PEAK STAGES IN FEET **							
			1	STAGE	100.00	100.00	100.55	101.09	101.27	101.38
				TIME	.00	.00	6.25	5.42	5.33	5.25
HYDROGRAPH AT										
+	SB-G1	.03	1	FLOW	15.	24.	29.	37.	43.	49.
				TIME	4.08	4.08	4.08	4.08	4.08	4.00
2 COMBINED AT										
+	CPG1	.03	1	FLOW	15.	24.	31.	184.	290.	365.
				TIME	4.08	4.08	6.25	5.42	5.33	5.25
ROUTED TO										
+	R-G1	.03	1	FLOW	9.	16.	21.	133.	249.	332.
				TIME	4.33	4.33	4.33	5.75	5.58	5.50
			** PEAK STAGES IN FEET **							
			1	STAGE	100.36	100.46	100.50	101.03	101.27	101.40
				TIME	4.33	4.33	4.33	5.75	5.58	5.50

HYDROGRAPH AT +	SB-G2	.06	1	FLOW	21.	36.	45.	57.	67.	77.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
2 COMBINED AT +	CPG2	.10	1	FLOW	30.	51.	64.	136.	254.	340.
				TIME	4.25	4.25	4.25	5.75	5.58	5.42
DIVERSION TO +	BD2NR	.10	1	FLOW	20.	51.	64.	136.	150.	150.
				TIME	4.25	4.25	4.25	5.75	5.33	5.08
HYDROGRAPH AT +	BEL87	.10	1	FLOW	14.	13.	14.	14.	104.	190.
				TIME	4.67	4.92	6.50	7.25	5.58	5.42
DIVERSION TO +	DVG2	.10	1	FLOW	11.	11.	11.	11.	81.	121.
				TIME	4.67	4.92	6.50	7.25	5.58	42
HYDROGRAPH AT +	BDVW	.10	1	FLOW	3.	3.	3.	3.	22.	69.
				TIME	4.67	4.92	6.50	7.25	5.58	5.42
ROUTED TO +	RCBG2	.10	1	FLOW	2.	2.	3.	2.	17.	60.
				TIME	4.75	5.17	6.83	7.50	5.75	5.58
			** PEAK STAGES IN FEET **							
			1	STAGE	100.23	100.22	100.23	100.21	100.49	100.82
				TIME	4.75	5.17	6.83	7.50	5.75	5.58
HYDROGRAPH AT +	RDV89	.00	1	FLOW	0.	0.	1.	238.	345.	427.
				TIME	.08	.08	6.25	5.42	5.33	5.25
ROUTED TO +	RDV89	.00	1	FLOW	0.	0.	0.	168.	292.	385.
				TIME	.08	.08	6.33	5.83	5.58	5.50
			** PEAK STAGES IN FEET **							
			1	STAGE	100.00	100.00	100.00	101.07	101.29	101.42
				TIME	.00	.00	6.33	5.83	5.58	5.50
HYDROGRAPH AT +	SB-G3	.26	1	FLOW	38.	77.	105.	144.	175.	204.
				TIME	4.58	4.58	4.58	4.58	4.58	4.58
3 COMBINED AT +	CP-G3	.36	1	FLOW	41.	78.	106.	208.	365.	521.
				TIME	4.58	4.58	4.58	5.75	5.58	5.50
ROUTED TO +	RBG3	.36	1	FLOW	40.	77.	105.	207.	363.	520.
				TIME	4.67	4.67	4.58	5.83	5.58	5.50
			** PEAK STAGES IN FEET **							
			1	STAGE	100.78	101.00	101.11	101.40	101.76	102.05
				TIME	4.67	4.67	4.58	5.83	5.58	5.50
HYDROGRAPH AT +	SB-G4	.23	1	FLOW	19.	55.	81.	117.	145.	172.
				TIME	4.42	4.42	4.42	4.42	4.42	4.42
3 COMBINED AT +	CPG4	9.02	1	FLOW	117.	226.	323.	594.	940.	1257.
				TIME	4.75	4.67	4.83	5.67	5.50	5.42
DIVERSION TO +	DVG4	9.02	1	FLOW	80.	159.	228.	423.	673.	887.
				TIME	4.75	4.67	4.83	5.67	5.50	5.42
HYDROGRAPH AT +	DV2CP	9.02	1	FLOW	37.	67.	94.	170.	268.	370.
				TIME	4.75	4.67	4.83	5.67	5.50	5.42
ROUTED TO +	RWG4	9.02	1	FLOW	37.	67.	94.	170.	267.	369.
				TIME	4.83	4.75	4.83	5.67	5.58	5.42
			** PEAK STAGES IN FEET **							
			1	STAGE	100.61	100.76	100.87	101.08	101.26	101.41
				TIME	4.83	4.75	4.83	5.67	5.58	5.42
HYDROGRAPH AT +	SB-G5	.20	1	FLOW	14.	43.	64.	94.	117.	140.
				TIME	4.25	4.25	4.25	4.33	4.33	4.33
2 COMBINED AT +	CPG5	9.22	1	FLOW	48.	103.	146.	217.	295.	411.
				TIME	4.67	4.67	4.67	4.67	5.50	5.42
ROUTED TO +	RCG5	9.22	1	FLOW	48.	103.	146.	215.	294.	409.
				TIME	4.75	4.67	4.67	4.67	5.58	5.42
			** PEAK STAGES IN FEET **							
			1	STAGE	100.79	101.20	101.43	101.75	102.02	102.33
				TIME	4.75	4.67	4.67	4.67	5.58	5.42
HYDROGRAPH AT +	RDVG4	.00	1	FLOW	80.	159.	228.	423.	673.	887.
				TIME	4.75	4.67	4.83	5.67	5.50	5.42
ROUTED TO +	RDG4	.00	1	FLOW	80.	159.	228.	423.	672.	887.
				TIME	4.75	4.75	4.83	5.67	5.50	5.42

			** PEAK STAGES IN FEET **							
			1	STAGE	99.74	99.97	100.12	100.41	100.72	100.94
				TIME	4.75	4.75	4.83	5.67	5.50	5.42
HYDROGRAPH AT +	SB-H2	.06	1	FLOW	3.	15.	24.	36.	46.	55.
				TIME	4.25	4.25	4.25	4.25	4.25	4.25
2 COMBINED AT +	CPH2	.06	1	FLOW	82.	168.	239.	425.	676.	893.
				TIME	4.75	4.67	4.75	5.67	5.50	5.42
ROUTED TO +	R-H2	.06	1	FLOW	81.	168.	239.	424.	675.	891.
				TIME	4.83	4.67	4.75	5.75	5.58	5.42
			** PEAK STAGES IN FEET **							
			1	STAGE	99.80	100.06	100.20	100.50	100.84	101.09
				TIME	4.83	4.67	4.75	5.75	5.58	5.42
HYDROGRAPH AT +	RDVG2	.00	1	FLOW	11.	11.	11.	11.	81.	121.
				TIME	4.67	4.92	6.50	7.25	5.58	5.42
ROUTED TO +	RRDG2	.00	1	FLOW	10.	9.	11.	9.	78.	120.
				TIME	4.75	5.08	6.75	7.33	5.67	5.50
			** PEAK STAGES IN FEET **							
			1	STAGE	100.38	100.35	100.40	100.35	101.16	101.44
				TIME	4.75	5.08	6.75	7.33	5.67	5.50
HYDROGRAPH AT +	SB-H1	.06	1	FLOW	5.	18.	27.	40.	49.	59.
				TIME	4.17	4.17	4.17	4.17	4.17	4.17
2 COMBINED AT +	CPH1	.06	1	FLOW	13.	21.	28.	40.	79.	123.
				TIME	4.17	4.08	4.17	4.17	5.67	5.50
DIVERSION TO +	DVPL	.06	1	FLOW	7.	12.	16.	22.	44.	68.
				TIME	4.17	4.08	4.17	4.17	5.67	5.50
HYDROGRAPH AT +	DWPL	.06	1	FLOW	6.	9.	12.	18.	35.	55.
				TIME	4.17	4.08	4.17	4.17	5.67	5.50
ROUTED TO +	RDWPL	.06	1	FLOW	6.	9.	12.	18.	34.	54.
				TIME	4.25	4.17	4.25	4.25	5.67	5.58
			** PEAK STAGES IN FEET **							
			1	STAGE	100.29	100.36	100.42	100.47	100.62	100.73
				TIME	4.25	4.17	4.25	4.25	5.67	5.58
HYDROGRAPH AT +	SB-H3	.09	1	FLOW	4.	22.	35.	53.	66.	79.
				TIME	4.25	4.25	4.25	4.25	4.25	4.25
3 COMBINED AT +	CPH3	.21	1	FLOW	88.	184.	264.	427.	707.	946.
				TIME	4.75	4.67	4.58	5.67	5.58	5.50
ROUTED TO +	R-H3	.21	1	FLOW	88.	184.	264.	427.	707.	948.
				TIME	4.83	4.67	4.58	5.75	5.58	5.50
			** PEAK STAGES IN FEET **							
			1	STAGE	101.19	101.70	101.99	102.43	103.01	103.43
				TIME	4.83	4.67	4.58	5.75	5.58	5.50
HYDROGRAPH AT +	SB-H4	.07	1	FLOW	18.	33.	43.	56.	67.	76.
				TIME	4.25	4.17	4.17	4.17	4.17	4.17
3 COMBINED AT +	CPH4	9.50	1	FLOW	144.	307.	439.	643.	1005.	1362.
				TIME	4.75	4.58	4.58	4.67	5.58	5.50
ROUTED TO +	RCH4	9.50	1	FLOW	143.	307.	438.	642.	1003.	1365.
				TIME	4.83	4.67	4.58	4.75	5.58	5.50
			** PEAK STAGES IN FEET **							
			1	STAGE	101.23	101.80	102.13	102.51	103.06	103.52
				TIME	4.83	4.67	4.58	4.75	5.58	5.50
HYDROGRAPH AT +	SB-H5	.07	1	FLOW	2.	15.	25.	39.	50.	60.
				TIME	4.17	4.25	4.17	4.17	4.17	4.17
2 COMBINED AT +	CPH5	9.57	1	FLOW	144.	315.	453.	662.	1006.	1369.
				TIME	4.75	4.67	4.58	4.67	5.58	5.50
DIVERSION TO +	DV91S	9.57	1	FLOW	0.	0.	0.	0.	0.	141.
				TIME	.08	.08	.08	.08	.08	5.50
HYDROGRAPH AT +	DS91S	9.57	1	FLOW	144.	315.	453.	662.	1006.	1227.
				TIME	4.75	4.67	4.58	4.67	5.58	5.50
ROUTED TO +	RRMG	9.57	1	FLOW	143.	313.	450.	660.	999.	1224.
				TIME	4.92	4.67	4.67	4.75	5.67	5.50

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                                   ** PEAK STAGES IN FEET **
                                   1   STAGE      101.67   102.62   103.22   103.98   104.99   105.57
                                       TIME         4.92     4.67     4.67     4.75     5.67     5.50

 HYDROGRAPH AT
+                  RDVPL      .00   1   FLOW          7.      12.      16.      22.      44.      68.
                                       TIME         4.17     4.08     4.17     4.17     5.67     5.50

 ROUTED TO
+                  DVPL-      .00   1   FLOW          6.      11.      15.      21.      42.      67.
                                       TIME         4.75     4.25     4.25     4.25     5.75     5.58

                                   ** PEAK STAGES IN FEET **
                                   1   STAGE      101.10   101.13   101.16   101.21   101.31   101.41
                                       TIME         4.75     4.25     4.25     4.25     5.75     5.58

 HYDROGRAPH AT
+                  SB-H6      .23   1   FLOW         18.      58.      90.     134.     168.     201.
                                       TIME         4.25     4.33     4.25     4.25     4.25     4.25

  3 COMBINED AT
+                  CPH6      9.80   1   FLOW        159.     360.     527.     771.    1051.    1310.
                                       TIME         4.83     4.58     4.58     4.58     5.67     5.50


*** NORMAL END OF HEC-1 ***
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