DRAINAGE PLAN

AND

SUPPORTING CALCULATIONS

FOR

STERLING FARMS 2ND ADDITION

AN ADDITION TO WICHITA, KANSAS

PREPARED BY

PROFESSIONAL ENGINEERING CONSULTANTS, P.A.

ENGINEERS

WICHITA, KANSAS

FEBRUARY 12, 1993

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MEMO

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PROJECT NO. 36-92600-2051
PROJECT: Sterling Farms 2nd Addition
Drainage Plan
DATE: 2/12/93

COPIES TO:
Jack Ritchie

FROM: Michael W. Berry, P.E. MWB

REFERENCE: Drainage Plan Computations

PLEASE ADVISE IMMEDIATELY OF ANY MISCONCEPTIONS OR OMISSIONS YOU BELIEVE TO BE CONTAINED HEREIN.

Attached hereto are the computations for the referenced project.

The publication Interim Drainage and Storm Sewer Policy for Design Criteria and Documentation, City of Wichita, as revised 7/1/87, was used as the guideline for the hydrologic and hydraulic computations. This publication is hereinafter referred to as the "Design Manual."

Manual #1, as referenced herein, refers to Design of Urban Highway Drainage - The State of the Art, by Reitz & Jens, Inc., April 1980. Manual #2 refers to Drainage of Highway Pavements, Hydraulic Engineering Circular #12, by Tye Engineering, Inc., March 1984.

The analysis made herein is based on the available site data which includes 1"=100' topographic map with 2' contours, project plans for various improvements on adjacent lands, and the original Drainage Plan for the Sterling Farms Development in 1988.

HYDROLOGIC ANALYSIS FOR STORM WATER SEWERS

For storm sewer design, the Rational Method was used for hydrologic analysis in accordance with the Design Manual. Runoff coefficients were estimated based on Rossmiller's modified rational formula as presented December 9-11, 1981 at Urban Stormwater Drainage Seminar sponsored by APWA, FHWA, and NHI.

For this development, a uniform assumption of the minimum time of concentration value of 15 minutes was appropriate. For off-site areas, times of concentration were computed using the SCS Lag-CN method.

Travel time for flow-through defined channels, pipes, etc., for these basins was estimated on the basis of Manning's Equation.

HYDRAULIC ANALYSIS FOR STORM WATER SEWERS

For each inlet, street flooding and inlet capacity was checked for the minor storm. Conveyance in the street was based on the modified Manning's Equation:

$$Q = 0.56\ (Z/n)\ S^{1/2}\ d^{8/3}$$ (Manual #1)

It was assumed that t_c for street flow was equal to t_c for pipe flow. This is a conservative assumption, as pipe velocities generally exceed gutter velocities.

For local streets, curb-deep flow is tolerable for the minor storm. For collectors, a single eight-foot center line should remain unflooded for the minor storm.

Inlet capacities were determined by the methods presented in Manual #2, using Chart No. 12.

In this analysis, City of Wichita Type 1A inlets and 3/8 in./ft. street cross-slope were assumed to be utilized. Minimum walk grade was assumed as 0.7 feet above the top of curb, except as otherwise noted. Collectors and local streets are assumed to have 6-5/8" standard curb and gutter.

All storm sewer systems serve residential streets. Therefore, the design minor storm has a recurrence interval of two years, and the major storm one hundred years. Systems are designed for the minor storm, with major storm overflows directed to the ponds via overflow into reserves.

To simplify analysis, the following assumptions were made:

1. The time of concentration is identical for both the major and minor storm.

2. The street conveyance was analyzed using only the street width. Depths above the curb up to the walk grade were used, but the conveyance of the parking was neglected. In general, the parking area conveyance is quite small, due to the relatively higher "n" factor.

Hydraulic computations for the pipe system were performed using PEC's Storm Program. This program uses Manning's Equation to calculate friction losses in pipes flowing full. Minor losses are computed by momentum principles at each structure. All pipes were assumed to be reinforced concrete with a Manning's "n" factor of 0.013. It is desirable to keep the hydraulic grade line approximately one foot below the top of curb elevations for the minor storm.

Open channel flow analysis was analyzed using Manning's Equation, in accordance with Section G3 of the Design Manual.

HYDRAULIC MODELS FOR DETENTION

The detention basin is discussed in the section entitled "Post Developed Conditions."

DRAINAGE MAP

A 1"=100' scale drainage map is included in a map pocket at the back of the report.

STERLING FARMS 2ND ADDITION DRAINAGE PLAN

RI = 2 RAINFALL INTENSITY

'a = 57.46 m = 0.82 b = 12.2 HYDRO-35 IDF FORMULA

SOIL GROUP NO. VARIES

NO.	AREA (ACRES)	LEN	Y	%IMP	%HLM	CN	CN ADJ	S	LAG	Fi	Fh	Tc	i	RI	C	Q
1A	5.34	570	0.42	38	100	75	75	3.33	0.36	0.75	0.36	15	3.83	2	0.32	6.5
B	2.13	570	0.42	38	100	75	75	3.33	0.36	0.75	0.36	15	3.83	2	0.32	2.6
C	1.20	470	0.35	38	100	77	77	2.99	0.32	0.77	0.39	15	3.83	2	0.33	1.5
2A	2.44	530	0.44	38	100	75	75	3.33	0.33	0.75	0.36	15	3.83	2	0.32	3.0
B	1.38	500	0.44	38	100	75	75	3.33	0.32	0.75	0.36	15	3.83	2	0.32	1.7
C	1.68	550	0.32	38	100	77	77	2.99	0.38	0.77	0.39	15	3.83	2	0.33	2.1
D	1.39	380	0.40	38	100	79	79	2.66	0.24	0.78	0.40	15	3.83	2	0.35	1.9
3A	0.99	450	0.32	38	100	81	81	2.35	0.29	0.78	0.43	15	3.83	2	0.37	1.4
B	1.05	450	0.56	38	100	83	83	2.05	0.20	0.79	0.46	15	3.83	2	0.40	1.6
C	2.11	810	0.56	38	100	83	83	2.05	0.33	0.79	0.46	15	3.83	2	0.40	3.2
D	2.98	790	0.40	38	100	83	83	2.05	0.38	0.79	0.46	15	3.83	2	0.39	4.5
E	2.93	810	0.40	38	100	83	83	2.05	0.39	0.79	0.46	15	3.83	2	0.39	4.4

STERLING FARMS 2ND ADDITION DRAINAGE PLAN

RI = 100 RAINFALL INTENSITY

a = 61.66 m = 0.66 b = 10 HYDRO-35 IDF FORMULA

SOIL GROUP NO. VARIES

NO.	AREA (ACRES)	LEN	Y	%IMP	%HLM	CN	CN ADJ	S	LAG	Fi	Fh	Tc	i	RI	C	Q
1A	5.34	570	0.42	38	100	75	75	3.33	0.36	0.75	0.36	15	7.37	100	0.46	18.2
B	2.13	570	0.42	38	100	75	75	3.33	0.36	0.75	0.36	15	7.37	100	0.46	7.3
C	1.20	470	0.35	38	100	77	77	2.99	0.32	0.77	0.39	15	7.37	100	0.48	4.2
2A	2.44	530	0.44	38	100	75	75	3.33	0.33	0.75	0.36	15	7.37	100	0.46	8.3
B	1.38	500	0.44	38	100	75	75	3.33	0.32	0.75	0.36	15	7.37	100	0.46	4.7
C	1.68	550	0.32	38	100	77	77	2.99	0.38	0.77	0.39	15	7.37	100	0.48	5.9
D	1.39	380	0.40	38	100	79	79	2.66	0.24	0.78	0.40	15	7.37	100	0.50	5.1
3A	0.99	450	0.32	38	100	81	81	2.35	0.29	0.78	0.43	15	7.37	100	0.52	3.8
B	1.05	450	0.56	38	100	83	83	2.05	0.20	0.79	0.46	15	7.37	100	0.55	4.2
C	2.11	810	0.56	38	100	83	83	2.05	0.33	0.79	0.46	15	7.37	100	0.55	8.5
D	2.98	790	0.40	38	100	83	83	2.05	0.38	0.79	0.46	15	7.37	100	0.54	12.0
E	2.93	810	0.40	38	100	83	83	2.05	0.39	0.79	0.46	15	7.37	100	0.54	11.8

SUMMARY OF INLETS

DRAINAGE BASIN NO. 1

NODE	SUB-BASIN COLLECTED	2-YEAR Q (CFS)	100-YEAR Q (CFS)
100	1A	6.5	18.2
110	1B	2.6	7.3
120	1C	1.5	4.2

DRAINAGE BASIN NO. 2

NODE	SUB-BASIN COLLECTED	2-YEAR Q (CFS)	100-YEAR Q (CFS)
200	2D	1.9	5.1
210	2A	3.0	8.3
	2B	1.7	4.7
	2C	2.1	5.9
TOTAL		6.8	18.9

DRAINAGE BASIN NO. 3

NODE	SUB-BASIN COLLECTED	2-YEAR Q (CFS)	100-YEAR Q (CFS)
310	3A	1.4	3.8
	3B	1.6	4.2
TOTAL		3.0	8.0
320	3C	2.1	3.3
350	3D	4.5	12.0
360	3E	4.4	11.8
370	3C	1.1	5.2

SWS SYSTEM NO. 1

FLOODED PAVEMENT WIDTHS USING 6 5/8'' COMBINED CURB & GUTTER

2-YEAR STORM : 4 FEET DRY PER LANE ON STERLING - MAX. DEPTH d = 0.30 ft.
: DRY ABOVE CURB ON LOCAL STREETS - MAX. DEPTH d = 0.55 ft.
100-YEAR STORM : DRY ABOVE R.O.W. ON ALL STREETS - MAX. DEPTH d = 1.25 ft.

EQUATION : ALLOWABLE Q = 0.56(Z/n)S^(1/2)d^(8/3)

Z = Reciprocal of pavement cross-slope
n = Roughness coefficient
S = Longitudinal pavement slope (ft./ft.)
d = Maximum allowable depth (above)

NODE	FLOW AMOUNT FROM	2-YEAR Q (cfs)	100-YEAR Q (cfs)	Z	n	S	ALLOWABLE 2-YEAR Q (cfs)	ALLOWABLE 100-YEAR Q (cfs)
100	50% W	3.3 *	9.1	32	0.016	0.0035	2.7	120.1
	50% N	3.3 *	9.1	32	0.016	0.0041	2.9	130.0
110	85% N	2.2	6.2	32	0.016	0.0041	2.9	130.0
	15% E	0.4	1.1	32	0.016	0.0045	3.0	136.2
120	80% W	1.2	3.4	32	0.016	0.0035	2.7	120.1
	20% E	0.3	0.8	32	0.016	0.0045	3.0	136.2
200	65% N	1.2	3.3	32	0.016	0.0046	15.4	137.7
	35% S	0.7	1.8	32	0.016	0.0036	13.6	121.8
210	70% N	4.7	13.0	32	0.016	0.0036	13.6	121.8
	30% S	2.1	5.9	32	0.016	0.0040	14.4	128.4
310	50% N	1.5	4.0	32	0.016	0.0145	27.4	244.5
	50% W	1.5	4.0	32	0.016	0.0056	3.4	152.0
320	100% W	2.5	6.6	32	0.016	0.0056	3.4	152.0

* AN ADDITIONAL INLET WILL BE REQUIRED IN SUB-BASIN 1A AFTER DEVELOPMENT OF THE AREA TO MAINTAIN THE FLOODED WIDTH CRITERIA.

SWS SYSTEM NO. 1

REQUIRED INLET LENGTHS FOR THE 2-YEAR STORM

2-YEAR STORM : 5' TYPE IA INLET - Q MAX. = 9 cfs
: 10' TYPE IA INLET - Q MAX. = 18 cfs

INLET NODE NUMBER	INLET CONDITION	Q INTERCEPTED (cfs)	LENGTH REQUIRED (ft.)
100	SUMP	6.5	5
110	SUMP	2.6	5
120	SUMP	1.5	5
200	SUMP	1.9	5
210	SUMP	6.8	5
310	SUMP	3.0	5
320	GRADE	2.1	5

STERLING FARMS 2ND ADDITION
SWS SYSTEM NO. 1

```
100 j, 1347.5000  330    0    9    8
110 i,  100     0.00     0.00     0.00     0.00     6.50    15.00  1354.50
120 i,  110     0.00     0.00     0.00     0.00     2.60    15.00  1354.50
130 i,  120     0.00     0.00     0.00     0.00     1.50    15.00  1354.50
140 m,  300  1353.80
150 i,  200     0.00     0.00     0.00     0.00     1.90    15.00  1352.30
160 i,  210     0.00     0.00     0.00     0.00     6.80    15.00  1352.30
170 i,  310     0.00     0.00     0.00     0.00     3.00    15.00  1352.00
180 i,  320     0.00     0.00     0.00     0.00     2.10    15.00  1352.30
190 m,  330  1347.50
200 p,  100  110    80.00   18 0.013  90.00   0.00
210 p,  110  120    32.00   18 0.013  90.00   0.00
220 p,  120  300   290.00   18 0.013  20.00   0.00
230 p,  300  320   320.00   24 0.013  90.00   0.00
240 p,  200  210    40.00   15 0.013 110.00   0.00
250 p,  210  310   240.00   18 0.013  20.00   0.00
260 p,  310  320    56.00   24 0.013   0.00   0.00
270 p,  320  330   100.00   30 0.013   0.00   0.00
280 e
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Date: 02-02-1993

Time: 16:51:04

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Storm Frequency = 2-Year

* * * HYDROLOGY * * *

Node to Node	C	Area (Ac)	Slope (%)	Length (Ft)	TC(0) (Min)	I(0) (In/Hr)	Q(0) (CFS)	TC (Min)	I (In/Hr)	Q (CFS)	Sum Q (CFS)	Size	Velocity (Ft/Sec)	Length (Ft)	TT (Min)	TT+TC (Min)
		Tributary Area						Hydrology Summation				Conduit Data				
100 110	.00	.00	.00	.0	15.00	3.83	6.50	15.00	3.83	6.50	6.50	18"	3.68	80.00	.36	15.36
110 120	.00	.00	.00	.0	15.00	3.83	2.60	15.36	3.79	2.57	9.07	18"	5.13	32.00	.10	15.47
120 300	.00	.00	.00	.0	15.00	3.83	1.50	15.47	3.78	1.48	10.55	18"	5.97	290.00	.81	16.28
300 320	.00	.00	.00	.0	.00	.00	.00	16.28	3.69	.00	10.55	24"	3.36	320.00	1.59	17.86
200 210	.00	.00	.00	.0	15.00	3.83	1.90	15.00	3.83	1.90	1.90	15"	1.55	40.00	.43	15.43
210 310	.00	.00	.00	.0	15.00	3.83	6.80	15.00	3.83	6.80	8.65	18"	4.89	240.00	.82	15.82
310 320	.00	.00	.00	.0	15.00	3.83	3.00	15.82	3.74	2.93	11.58	24"	3.68	56.00	.25	16.07
320 330	.00	.00	.00	.0	15.00	3.83	2.10	17.86	3.53	1.93	23.49	30"	4.79	100.00	.35	18.21

Date: 02-02-1993
Time: 16:51:04

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Storm Frequency = 2-Year

* * * HYDRAULICS * * *

Node	Hyd-Slope (Ft/Ft)	Friction (Ft)	Bend (Ft)	Transition (Ft)	Manhole (Ft)	Deflection (Ft)	Junction (Ft)	Total (Ft)	Hyd-Gl Elevation	Desired Elevation	Diff. (Ft)
100	.00383	.3063	.0000	.0000	.0000	.0000	.0000	.3063	1353.4710	1354.5000	1.03
110	.00746	.2387	.0000	.0199	.0000	.1050	.4273	.7909	1353.1640	1354.5000	1.34
120	.01009	2.9259	.0000	.0144	.0000	.2046	.3331	3.4781	1352.3730	1354.5000	2.13
300	.00218	.6961	.0000	.0757	.0000	.0455	-.3187	.4987	1348.8950	1353.8000	4.90
200	.00087	.0346	.0000	.0000	.0000	.0000	.0000	.0346	1351.1890	1352.3000	1.11
210	.00678	1.6263	.0000	.0335	.0000	.0237	.8372	2.5207	1351.1540	1352.3000	1.15
310	.00262	.1466	.0000	.0322	.0000	.0306	.0278	.2372	1348.6340	1352.0000	3.37
320	.00328	.3280	.0000	.0145	.0000	.0000	.5541	.8966	1348.3970	1352.3000	3.90
330	.00000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1347.5000	1347.5000	.00

SWS SYSTEM NO. 2

FLOODED PAVEMENT WIDTHS USING 6 5/8'' COMBINED CURB & GUTTER

2-YEAR STORM : 4 FEET DRY PER LANE ON STERLING - MAX. DEPTH d = 0.30 ft.
: DRY ABOVE CURB ON LOCAL STREETS - MAX. DEPTH d = 0.55 ft.
100-YEAR STORM : DRY ABOVE R.O.W. ON ALL STREETS - MAX. DEPTH d = 1.25 ft.

EQUATION : ALLOWABLE Q = 0.56(Z/n)S^(1/2)d^(8/3)

Z = Reciprocal of pavement cross-slope
n = Roughness coefficient
S = Longitudinal pavement slope (ft./ft.)
d = Maximum allowable depth (above)

NODE	FLOW AMOUNT FROM	2-YEAR Q (cfs)	100-YEAR Q (cfs)	Z	n	S	ALLOWABLE 2-YEAR Q (cfs)	ALLOWABLE 100-YEAR Q (cfs)
350	20% W	0.9	2.4	32	0.016	0.0040	2.9	128.4
	80% N	3.6	9.6	32	0.016	0.0040	14.4	128.4
360	90% N	4.0	10.6	32	0.016	0.0040	14.4	128.4
	10% E	0.4	1.2	32	0.016	0.0040	2.9	128.4
370	* W	0.7	4.1	32	0.016	0.0040	2.9	128.4
	13% E	0.4	1.1	32	0.016	0.0040	2.9	128.4

* A 5' TYPE IA INLET AT NODE 320 WOULD INTERCEPT 86% OF THE 2-YEAR PEAK FLOW AND 50% OF THE 100-YEAR PEAK FLOW ALLOWING 14% AND 50%, RESPECTIVELY, TO BYPASS. THE BYPASS FLOW FOR EACH RETURN PERIOD PERIOD IS ADDED TO THE FLOW ACCUMULATED BETWEEN NODES 320 AND 370 TO COMPARE WITH THE ALLOWABLE FLOWS AT NODE 370.

SWS SYSTEM NO. 2

REQUIRED INLET LENGTHS FOR THE 2-YEAR STORM

2-YEAR STORM : 5' TYPE IA INLET - Q MAX. = 9 cfs
: 10' TYPE IA INLET - Q MAX. = 18 cfs

INLET NODE NUMBER	INLET CONDITION	Q INTERCEPTED (cfs)	LENGTH REQUIRED (ft.)
350	SUMP	4.5	5
360	SUMP	4.4	5
370	SUMP	1.1	5

STERLING FARMS 2ND ADDITION
SWS SYSTEM NO. 2

```
100 j, 1347.5000  380     0     4     3
110 i,  350      0.00     0.00      0.00      0.00      4.50     15.00  1350.80
120 i,  360      0.00     0.00      0.00      0.00      4.40     15.00  1350.80
130 i,  370      0.00     0.00      0.00      0.00      1.10     15.00  1351.10
140 m,  380  1347.50
150 p,  350  360     60.00    15 0.013   90.00    0.00
160 p,  360  370     56.00    18 0.013    0.00    0.00
170 p,  370  380     50.00    18 0.013    0.00    0.00
180 e
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Date: 02-04-1993

Time: 14:42:29

Input File: STFSYS2.STM

Storm Frequency = 2-Year

* * * HYDROLOGY * * *

Tributary Area									Hydrology Summation				Conduit Data			
Node to Node		C	Area (Ac)	Slope (%)	Length (Ft)	TC(0) (Min)	I(0) (In/Hr)	Q(0) (CFS)	TC (Min)	I (In/Hr)	Q (CFS)	Sum Q (CFS)	Size	Velocity (Ft/Sec)	Length (Ft)	TT (Min)	TT+TC (Min)
350	360	.00	.00	.00	.0	15.00	3.83	4.50	15.00	3.83	4.50	4.50	15"	3.67	60.00	.27	15.27
360	370	.00	.00	.00	.0	15.00	3.83	4.40	15.27	3.80	4.36	8.86	18"	5.02	56.00	.19	15.46
370	380	.00	.00	.00	.0	15.00	3.83	1.10	15.46	3.78	1.09	9.95	18"	5.63	50.00	.15	15.61

Date: 02-04-1993
Time: 14:42:29

Input File: STFSYS2.STM

Storm Frequency = 2-Year

* * * HYDRAULICS * * *

Node	Hyd-Slope (Ft/Ft)	Friction (Ft)	Bend (Ft)	Transition (Ft)	Manhole (Ft)	Deflection (Ft)	Junction (Ft)	Total (Ft)	Hyd-Gl Elevation	Desired Elevation	Diff. (Ft)
350	.00485	.2912	.0000	.0000	.0000	.0000	.0000	.2912	1349.6260	1350.8000	1.17
360	.00712	.3988	.0000	.0182	.0000	.1044	.6110	1.1324	1349.3350	1350.8000	1.47
370	.00897	.4485	.0000	.0102	.0000	.0000	.2437	.7024	1348.2020	1351.1000	2.90
380	.00000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1347.5000	1347.5000	.00

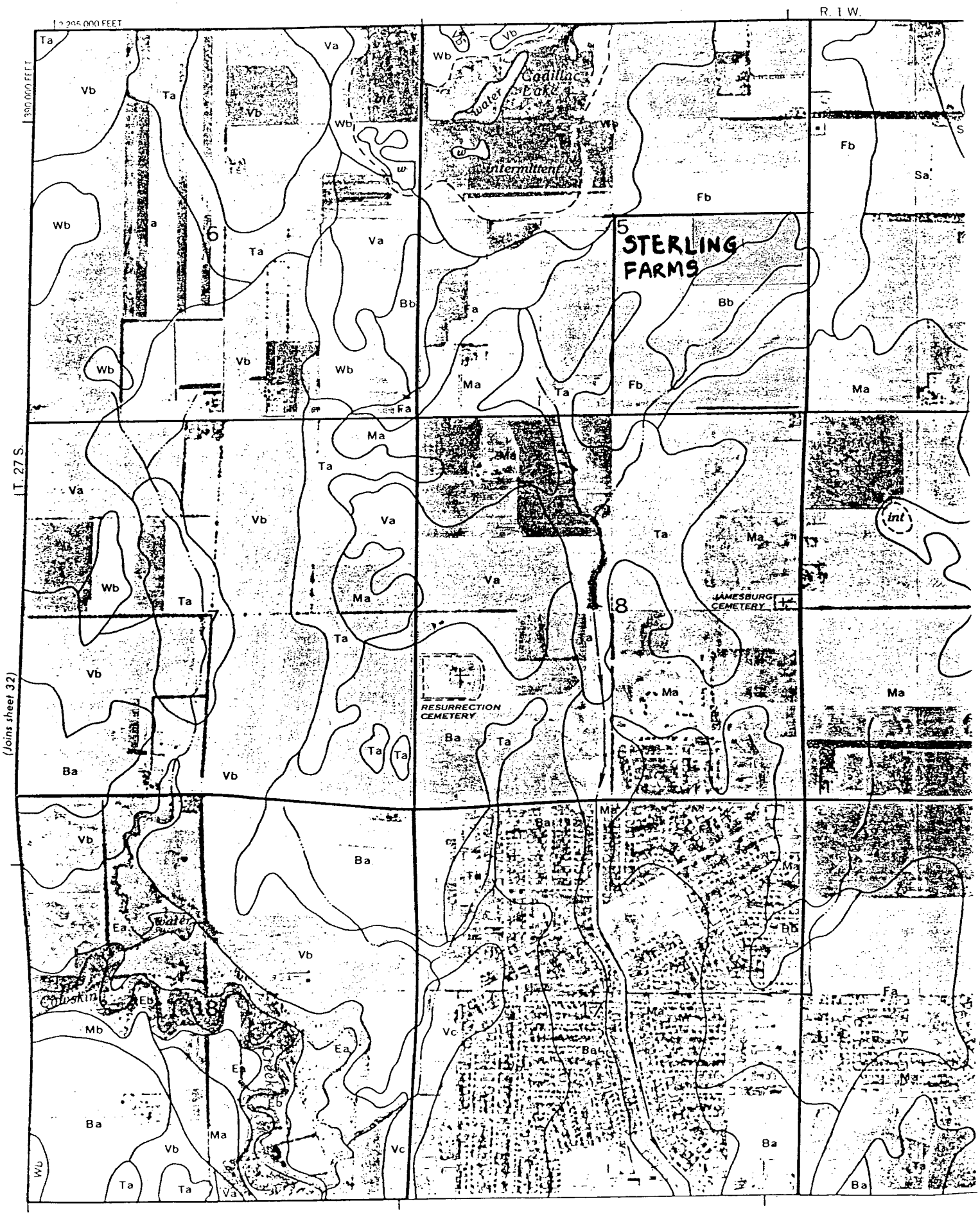

R. 1 W.
2,295,000 FEET
390,000 FEET
T. 27 S.
(Joins sheet 32)
STERLING FARMS
Cadillac Lake
water
intermittent
RESURRECTION CEMETERY
JAMESBURG CEMETERY
Calvskin
Ta
Va
Vb
Wb
Bb
Fb
Ma
Fa
Ba
Ea
Eb
Mb
Vc
5
6
8
18

EXHIBIT NO. 1

SOIL LEGEND

SYMBOL	HYDROLOGIC GROUP	NAME
Aa	B	Albion-Shellabarger sandy loams, 1 to 4 percent slopes
Ab	B	Albion and Shellabarger sandy loans, 7 to 15 percent slopes
Ba	C	Blanket silt loam, 0 to 1 percent slopes
Bb	C	Blanket silt loan, 1 to 3 percent slopes
Ca	B	Canadian fine sandy loan
Cb	B	Canadian-Waldeck fine sandy loams
Cc	D	Carwile fine sandy loam
Cd	B	Clark-Ost clay loams, 1 to 4 percent slopes
Ce	C	Clime silty clay, 3 to 6 percent slopes
Ea	B	Elandco silt loam
Eb	B	Elandco silt loam, occasionally flooded
Ec	B	Elandco silt loam, frequently flooded
Fa	B	Farnum loam, 0 to 1 percent slopes
Fb	B	Farnum loam, 1 to 3 percent slopes
Fc	B	Farnum loam, sandy substratum, 0 to 1 percent slopes
Ga	D	Goessel silty clay, 0 to 1 percent slopes
Gb	D	Goessel silty clay, 1 to 2 percent slopes
Ia	D	Irwin silty clay loam, 1 to 3 percent slopes
Ib	D	Irwin silty clay loam, 3 to 6 percent slopes
Ic	D	Irwin silty clay loam, 2 to 6 percent slopes, eroded
La	C	Lesho loam
Lb	A	Lincoln soils
Ma	B	Milan loam, 1 to 3 percent slopes
Mb	B	Milan form, 3 to 6 percent slopes
Mc	B	Milan clay loam, 2 to 6 percent slopes, eroded
Na	B	Naron fine sandy loam
Oc	D	Owens clay loam, 1 to 3 percent slopes
Od	D	Owens-Rock outcrop complex, 3 to 10 percent slopes
Pa		Pits
Pb	D	Plevna fine sandy loam
Pc	A	Pratt loamy fine sand, undulating
Pd	A	Pratt-Tivoli complex, rolling
Ra	D	Renfrow silty clay loam, 1 to 3 percent slopes
Rb	D	Renfrow silty clay loam, 3 to 6 percent slopes
Rc	D	Renfrow-Owens clay loams, 1 to 4 percent slopes
Rd	D	Rosehill silty clay, 1 to 3 percent slopes
Sa	B	Shellabarger sandy loam, 1 to 3 percent slopes
Sb	B	Shellabarger sandy loam, 3 to 6 percent slopes
Sc	B	Shellabarger sandy loam, 3 to 6 percent slopes, eroded
Ta	D	Tabler silty clay loam
Tb	D	Tabler-Drummond complex
Ua	B	Urban land-Canadian complex
Ub	B	Urban land-Elandco complex
Uc	B	Urban land-Farnum complex, 0 to 3 percent slopes
Ud	D	Urban land-Irwin complex, 1 to 3 percent slopes
Ue	D	Urban land-Tabler complex
Va	B	Vanoss silt loam, 0 to 1 percent slopes
Vb	B	Vanoss silt loam, 1 to 3 percent slopes
Vc	B	Vanoss silt loam, 3 to 6 percent slopes
Vd	B	Vanoss silt loam, 3 to 6 percent slopes, eroded
Ve	D	Vernon sandy loam, 1 to 3 percent slopes
Vf	D	Vernon sandy loam, 3 to 6 percent lopes
Wa	C	Waldeck sandy loam
Wb	D	Waurika silt loam

Table 3-6 Runoff Curve Numbers (1)

...noff curve number for selected agricultural, suburban, and urban land use. (Antecedent moisture condition ...and $I_a = 0.2S$)

LAND USE DESCRIPTION		HYDROLOGIC SOIL GROUP			
		A	B	C	D
Cultivated land[1] : without conservation treatment		72	81	88	91
: with conservation treatment		62	71	78	81
Pasture or range land: poor condition		68	79	86	89
good condition		39	61	74	80
Meadow: good condition		30	58	71	78
Wood or Forest land: thin stand, poor cover, no mulch		45	66	77	83
good cover[2]		25	55	70	77
Open Spaces, lawns, parks, golf courses, cemeteries, etc.					
good condition: grass cover on 75% or more of the area		39	61	74	80
fair condition: grass cover on 50% to 75% of the area		49	69	79	84
Commercial and business areas (85% impervious)		89	92	94	95
Industrial districts (72% impervious)		81	88	91	93
Residential: [3]					
Average lot size	Average % Impervious [4]				
1/8 acre or less	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
Paved parking lots, roofs, driveways, etc.[5]		98	98	98	98
Streets and roads:					
paved with curbs and storm sewers[5]		98	98	98	98
gravel		76	85	89	91
dirt		72	82	87	89

1 For a more detailed description of agricultural land use curve numbers refer to National Engineering Handbook, Section 4, Hydrology, Chapter 9, Aug. 1972.

2 Good cover is protected from grazing and litter and brush cover soil.

3 Curve numbers are computed assuming the runoff from the house and driveway is directed towards the street with a minimum of roof water directed to lawns where additional infiltration could occur.

4 The remaining pervious areas (lawn) are considered to be in good pasture condition for these curve numbers.

5 In some warmer climates of the country a curve number of 95 may be used.

PROJECT _____

SHEET _____ OF _____

BY _____

DATE _____

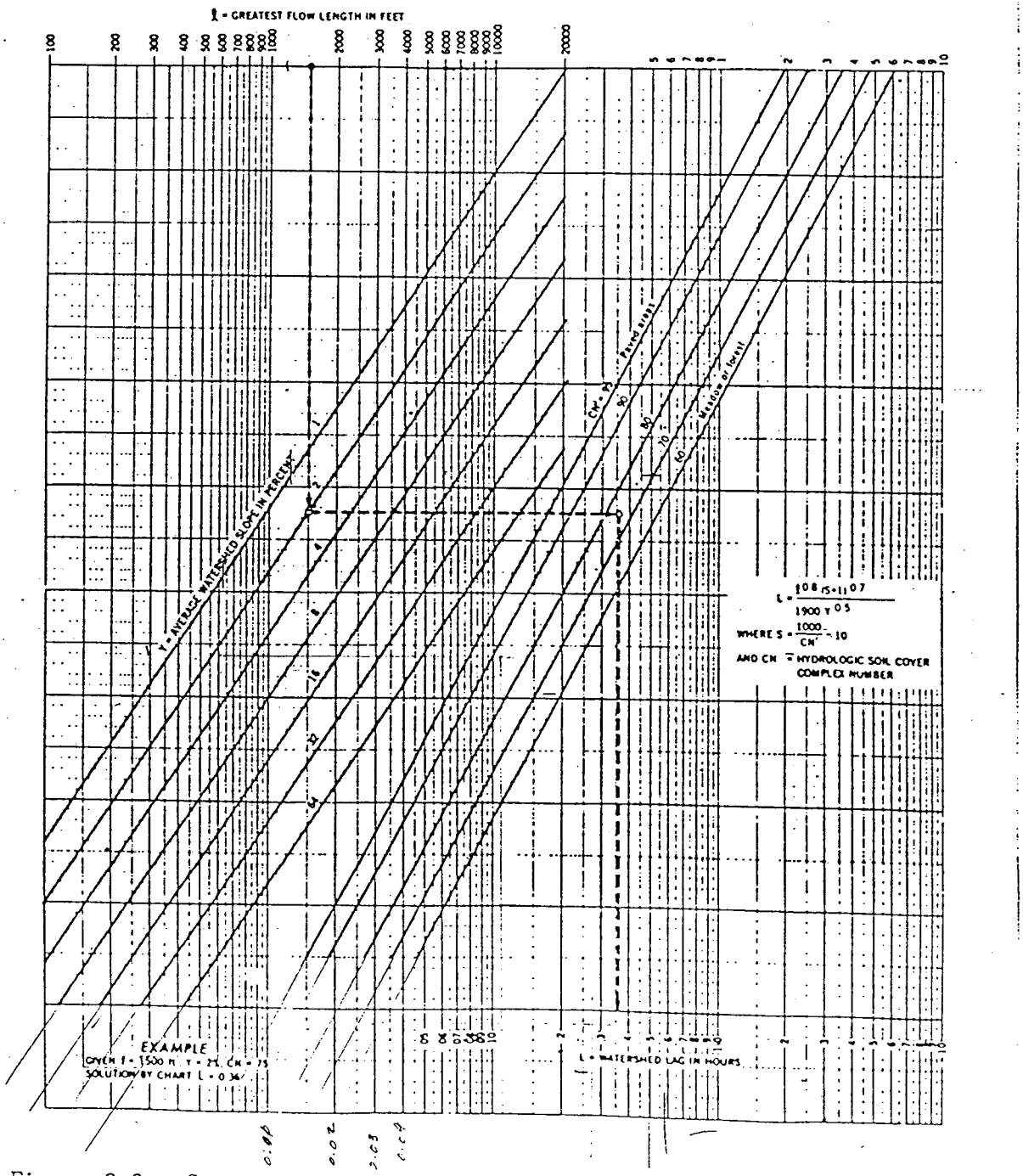


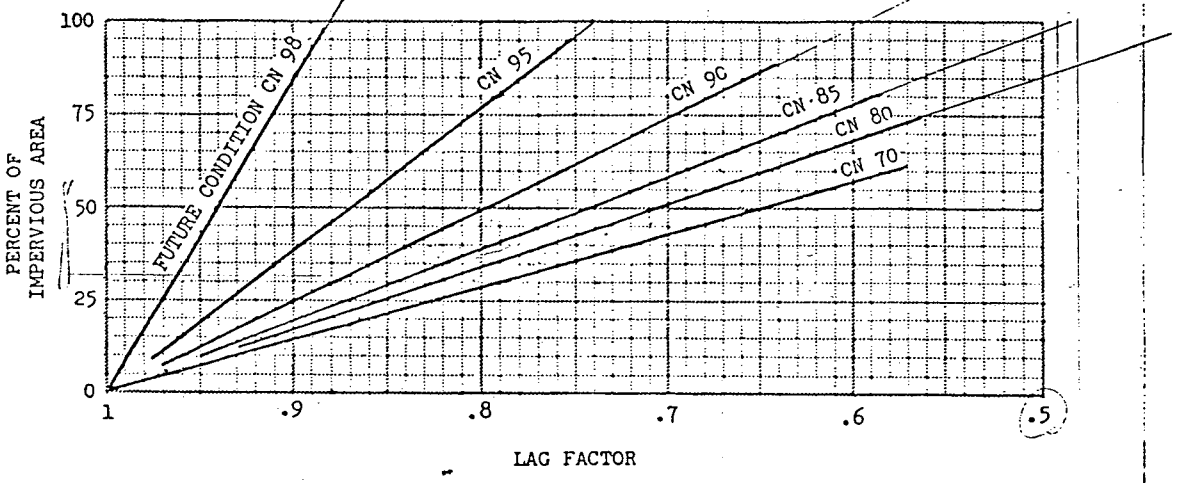
Figure 3-3.--Curve number method for estimating lag (L) for homogeneous watersheds under natural conditions up to 2,000 acres.

PROJECT _____

SHEET _____ OF _____

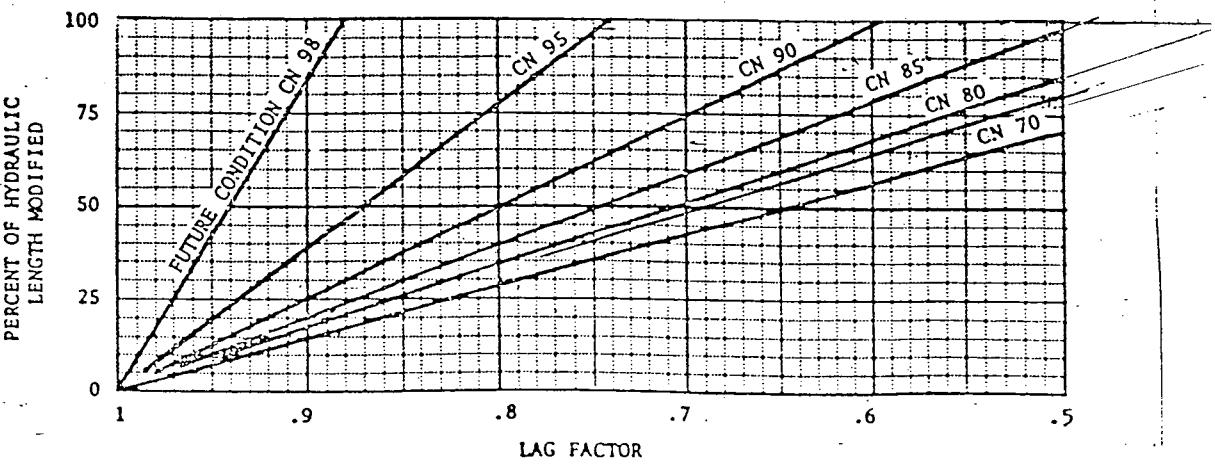
BY _____

DATE _____



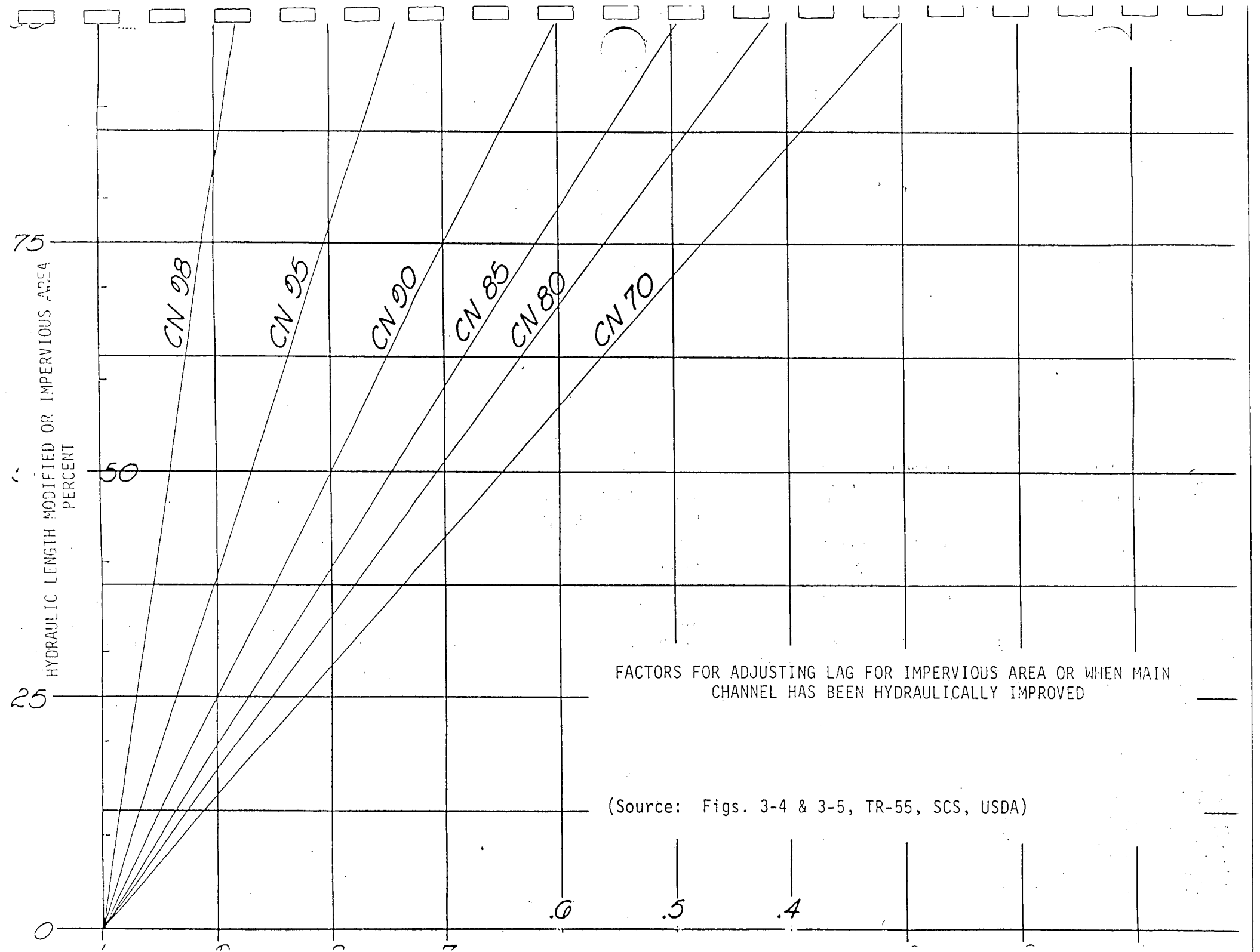
F_{IMP}

Figure 3-5.--Factors for adjusting lag from equation 3-2 or figure 3-3 when impervious areas occur in the watershed.



F_{HLM}

Figure 3-4.--Factors for adjusting lag from equation 3-2 or figure 3-3 when the main channel has been hydraulically improved.


75
50
25
0
HYDRAULIC LENGTH MODIFIED OR IMPERVIOUS AREA
PERCENT
CN 98
CN 95
CN 90
CN 85
CN 80
CN 70
.6
.5
.4
FACTORS FOR ADJUSTING LAG FOR IMPERVIOUS AREA OR WHEN MAIN CHANNEL HAS BEEN HYDRAULICALLY IMPROVED
(Source: Figs. 3-4 & 3-5, TR-55, SCS, USDA)

K1

April 15, 1986

ATTACHMENT A
DRAINAGE CRITERIA MANUAL

CITY OF WICHITA, KANSAS

RAINFALL INTENSITY TABLE FOR SEDGWICK COUNTY, KANSAS

The following tabulation contains rainfall intensity in inches per hour as derived from ESSA Weather Bureau Technical Paper 40 Modified to NWS Hydro-35, 1977 During First Hour

DURATION IN MINUTES	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
5	4.18	5.57	6.53	7.41	8.52	9.48	10.32
6	3.99	5.32	6.25	7.09	8.16	9.09	9.89
7	3.81	5.09	5.99	6.81	7.84	8.74	9.50
8	3.66	4.89	5.75	6.55	7.55	8.42	9.15
9	3.52	4.70	5.54	6.31	7.28	8.13	8.83
10	3.39	4.52	5.34	6.09	7.04	7.86	8.54
11	3.27	4.36	5.16	5.89	6.81	7.61	8.27
12	3.18	4.21	4.99	5.71	6.60	7.38	8.02
13	3.05	4.08	4.84	5.53	6.41	7.17	7.79
14	2.96	3.95	4.69	5.37	6.23	6.97	7.57
15	2.87	3.83	4.56	5.22	6.06	6.78	7.37
16	2.78	3.72	4.43	5.08	5.90	6.60	7.18
17	2.71	3.61	4.31	4.95	5.75	6.44	7.00
18	2.63	3.51	4.20	4.83	5.61	6.29	6.84
19	2.56	3.42	4.10	4.71	5.47	6.14	6.68
20	2.50	3.33	4.00	4.60	5.35	6.00	6.53
21	2.44	3.25	3.90	4.50	5.23	5.87	6.39
22	2.38	3.17	3.81	4.40	5.12	5.75	6.26
23	2.32	3.10	3.73	4.31	5.01	5.63	6.13
24	2.27	3.03	3.65	4.22	4.91	5.52	6.01
25	2.22	2.96	3.57	4.13	4.81	5.41	5.90
26	2.20	2.90	3.50	4.05	4.72	5.31	5.79
27	2.16	2.84	3.43	3.98	4.63	5.21	5.69
28	2.14	2.78	3.37	3.90	4.55	5.12	5.59
29	2.11	2.72	3.30	3.83	4.47	5.03	5.49
30	2.08	2.67	3.24	3.76	4.39	4.94	5.40
31	2.05	2.62	3.19	3.70	4.32	4.86	5.32
32	2.02	2.57	3.10	3.63	4.25	4.79	5.22
33	1.99	2.52	3.05	3.57	4.18	4.71	5.14
34	1.96	2.48	3.01	3.51	4.11	4.63	5.07
35	1.93	2.44	2.98	3.46	4.05	4.56	5.00
36	1.91	2.39	2.93	3.41	3.99	4.50	4.93
37	1.89	2.35	2.88	3.36	3.93	4.43	4.86
38	1.87	2.32	2.84	3.31	3.87	4.37	4.79
39	1.85	2.28	2.80	3.26	3.82	4.31	4.73
40	1.83	2.24	2.76	3.22	3.76	4.25	4.66
41	1.81	2.21	2.72	3.17	3.71	4.19	4.60
42	1.79	2.18	2.68	3.13	3.66	4.13	4.54
43	1.77	2.14	2.64	3.09	3.61	4.08	4.49
44	1.75	2.11	2.61	3.05	3.57	4.03	4.43
45	1.73	2.08	2.57	3.01	3.52	3.98	4.38

ATTACHMENT A CONTINUED
Page 2

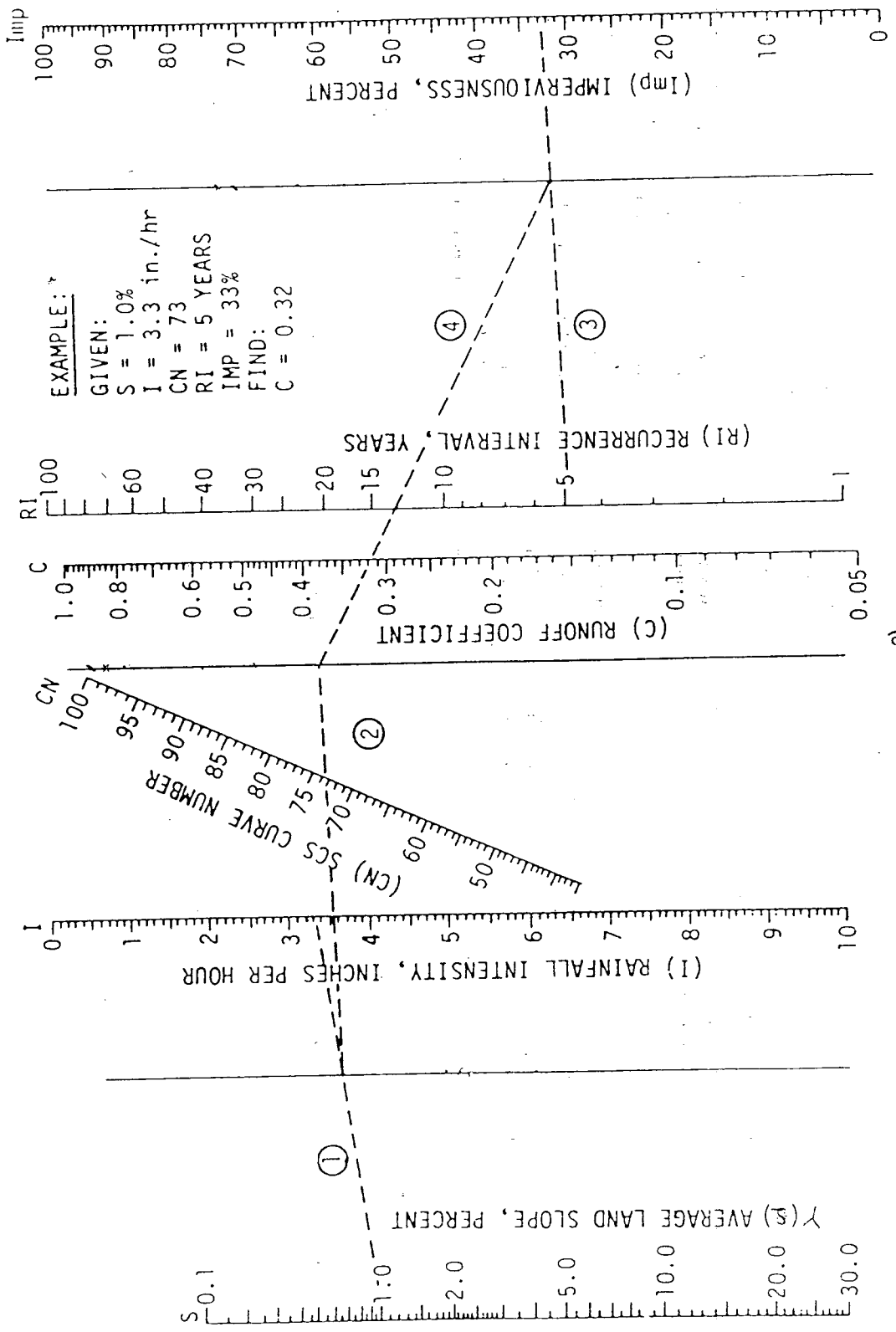
DURATION IN MINUTES	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
46	1.70	2.05	2.54	2.97	3.48	3.93	4.33
47	1.67	2.02	2.50	2.93	3.44	3.88	4.28
48	1.66	2.00	2.47	2.90	3.39	3.84	4.23
49	1.64	1.97	2.44	2.86	3.35	3.79	4.18
50	1.61	1.95	2.41	2.83	3.32	3.75	4.13
51	1.59	1.92	2.38	2.79	3.28	3.71	4.09
52	1.56	1.89	2.35	2.76	3.24	3.67	4.05
53	1.54	1.86	2.33	2.73	3.20	3.63	4.00
54	1.52	1.84	2.30	2.70	3.17	3.59	3.96
55	1.50	1.81	2.27	2.67	3.14	3.55	3.92
56	1.47	1.79	2.25	2.64	3.10	3.51	3.88
57	1.45	1.76	2.22	2.61	3.07	3.48	3.84
58	1.43	1.74	2.20	2.59	3.04	3.44	3.81
59	1.42	1.72	2.18	2.56	3.01	3.41	3.77
60	1.40	1.69	2.15	2.53	2.98	3.37	3.73
61	1.38	1.67	2.13	2.51	2.95	3.34	3.70
62	1.36	1.65	2.11	2.48	2.92	3.31	3.67
63	1.34	1.63	2.09	2.46	2.89	3.28	3.63
64	1.33	1.61	2.07	2.44	2.86	3.25	3.60
65	1.31	1.59	2.05	2.41	2.84	3.22	3.57
66	1.30	1.57	2.03	2.39	2.81	3.19	3.54
67	1.28	1.56	2.01	2.37	2.79	3.16	3.51
68	1.26	1.54	1.99	2.35	2.76	3.13	3.48
69	1.25	1.52	1.97	2.33	2.74	3.10	3.45
70	1.24	1.50	1.95	2.31	2.71	3.08	3.42
71	1.22	1.49	1.93	2.28	2.69	3.05	3.39
72	1.21	1.47	1.92	2.26	2.67	3.02	3.36
73	1.20	1.46	1.90	2.25	2.64	3.00	3.34
74	1.18	1.44	1.88	2.23	2.63	2.98	3.31
75	1.17	1.43	1.86	2.21	2.61	2.95	3.29
76	1.16	1.41	1.85	2.19	2.58	2.93	3.26
77	1.15	1.40	1.83	2.17	2.55	2.90	3.24
78	1.13	1.38	1.82	2.15	2.53	2.88	3.22
79	1.12	1.37	1.80	2.14	2.50	2.86	3.19
80	1.11	1.36	1.79	2.12	2.48	2.84	3.16
81	1.10	1.34	1.77	2.10	2.46	2.82	3.13
82	1.09	1.33	1.76	2.08	2.43	2.79	3.10
83	1.08	1.32	1.74	2.06	2.41	2.76	3.07
84	1.07	1.31	1.73	2.04	2.39	2.74	3.04
85	1.06	1.30	1.72	2.02	2.37	2.71	3.01
86	1.05	1.28	1.70	2.00	2.34	2.69	2.99
87	1.04	1.27	1.69	1.99	2.32	2.66	2.96
88	1.03	1.26	1.68	1.97	2.30	2.64	2.93
89	1.02	1.25	1.68	1.95	2.28	2.62	2.91
90	1.01	1.24	1.66	1.93	2.26	2.59	2.88

ATTACHMENT A CONTINUED
Page 3

DURATION IN MINUTES	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
91	1.00	1.23	1.65	1.92	2.24	2.57	2.86
92	1.00	1.22	1.63	1.90	2.22	2.55	2.83
93	0.99	1.21	1.62	1.89	2.20	2.53	2.81
94	0.98	1.20	1.61	1.87	2.19	2.51	2.79
95	0.97	1.19	1.59	1.85	2.17	2.49	2.76
96	0.96	1.18	1.58	1.84	2.15	2.46	2.74
97	0.96	1.17	1.57	1.82	2.13	2.44	2.72
98	0.95	1.16	1.56	1.81	2.12	2.42	2.70
99	0.94	1.15	1.54	1.80	2.10	2.41	2.67
100	0.93	1.14	1.53	1.78	2.08	2.39	2.65
101	0.93	1.13	1.52	1.77	2.07	2.39	2.65
102	0.92	1.13	1.51	1.75	2.05	2.35	2.61
103	0.91	1.12	1.50	1.74	2.04	2.33	2.59
104	0.90	1.11	1.49	1.73	2.02	2.31	2.57
105	0.90	1.10	1.47	1.72	2.01	2.30	2.55
106	0.89	1.09	1.46	1.70	1.99	2.28	2.54
107	0.88	1.09	1.45	1.69	1.98	2.26	2.52
108	0.88	1.08	1.44	1.68	1.96	2.25	2.50
109	0.87	1.07	1.43	1.67	1.95	2.23	2.48
110	0.87	1.06	1.42	1.65	1.93	2.21	2.46
111	0.86	1.06	1.41	1.64	1.92	2.20	2.45
112	0.85	1.05	1.40	1.63	1.91	2.18	2.43
113	0.85	1.04	1.39	1.62	1.89	2.17	2.41
114	0.84	1.03	1.38	1.61	1.88	2.15	2.40
115	0.84	1.03	1.37	1.60	1.87	2.14	2.38
116	0.83	1.02	1.36	1.59	1.86	2.12	2.36
117	0.82	1.01	1.36	1.58	1.84	2.11	2.35
118	0.82	1.01	1.35	1.57	1.83	2.09	2.33
119	0.81	1.00	1.34	1.56	1.82	2.08	2.32
120	0.81	0.99	1.33	1.55	1.81	2.07	2.30

DURATION IN HOURS	RETURN PERIODS OF 1-YR	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
2	0.81	0.99	1.33	1.55	1.81	2.07	2.30
3	0.59	0.72	0.97	1.13	1.32	1.51	1.68
4	0.47	0.58	0.78	0.91	1.06	1.21	1.35
5	0.40	0.49	0.66	0.77	0.89	1.02	1.14
6	0.35	0.42	0.57	0.67	0.78	0.89	0.99
8	0.28	0.34	0.46	0.53	0.62	0.71	0.79
10	0.23	0.29	0.39	0.45	0.52	0.60	0.67
12	0.20	0.25	0.33	0.39	0.45	0.52	0.58
18	0.15	0.18	0.24	0.28	0.33	0.38	0.42
24	0.12	0.15	0.20	0.23	0.27	0.31	0.34

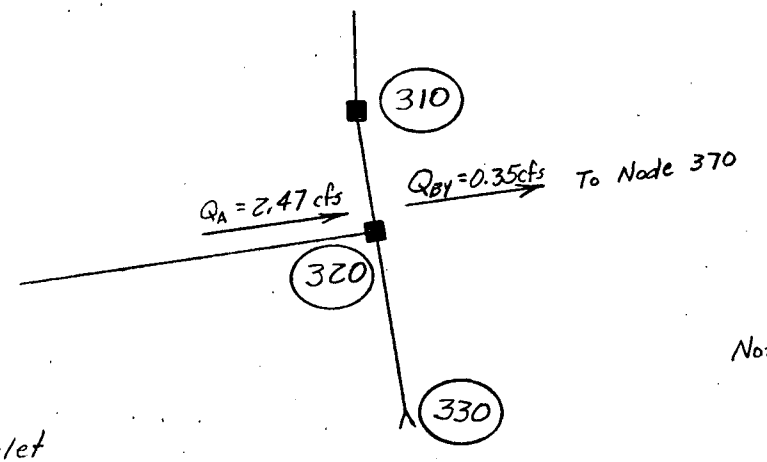
ROSSMILLER
FIG. 3



$$C = 7.2(10)^{-7} CN^{3} RI^{.05} ((.01CN)^{.6}) - (.001CN^{1.48})^{.15-.11((Imp+1)/2)^{.7}}$$

FIG. 3.- Nomograph for Estimating C in the Rational Formula

STORM WATER COLLECTION



Note: W and d are measured from the edge of pavement and do not include the width and depth of the gutter pan.

* Analyzed for a Type IA Inlet ($L = 5'$, $L_o = 4'$)

Proj. No.: Sterling Farms 2nd - Phase
Area: Sub-Basin 3C Date: 2-2-93
Computed by: JPS Ck'd by:

Dr. Area		Inlet		Hydrology (Q=CIA)								Gutter Flow & Inlet Interception						
No.	Acres	No.	Location	S	L	T	C	A	CA	I	Q	Q_6	Gutter Slope	Rev'd Slope	W	d	Qin	Bypass
* 3C	1.63	320	Sub-Basin 3C	0.56%	520	15	0.40	1.63	0.64	3.83	2.47	2.47	3.0%	1/32	6.08	0.19	2.12	0.35

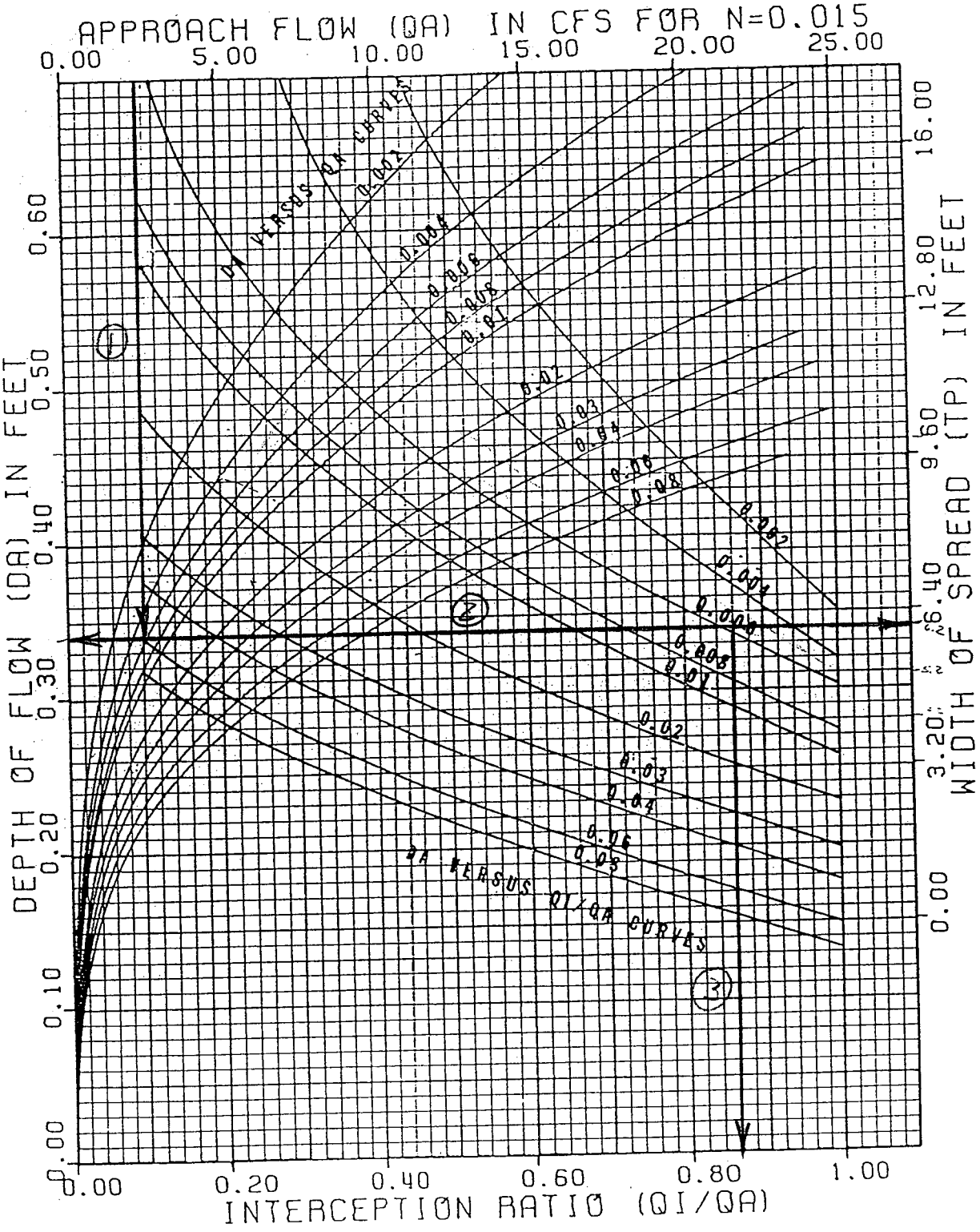
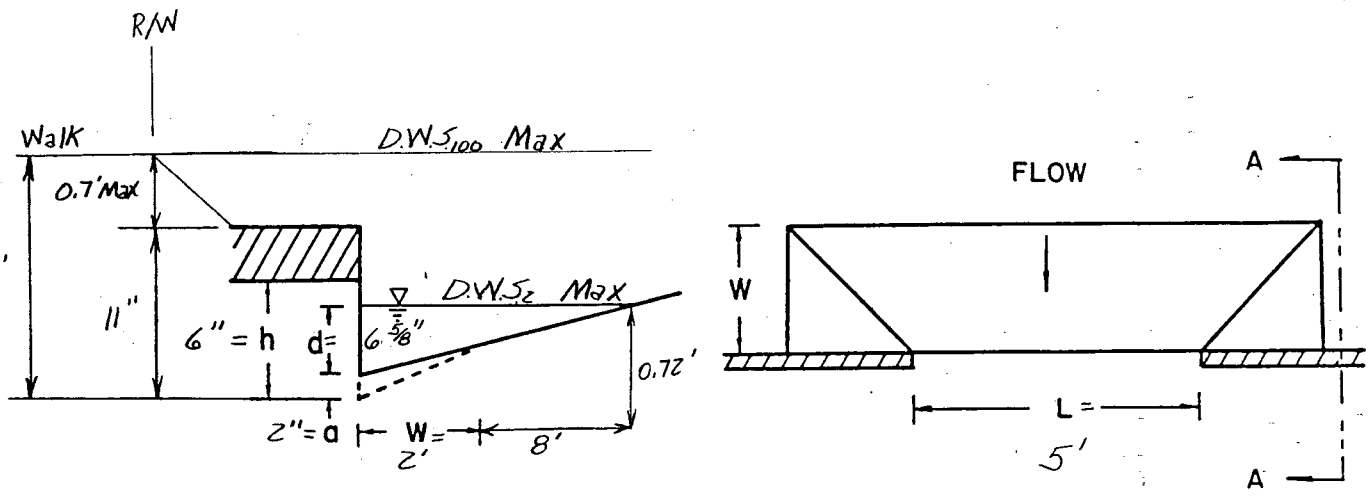


FIGURE A-7 DESIGN CURVES FOR SHC TYPE-22 STORM WATER INLET: L_0 = 4 FEET AND S_X = 1/32.



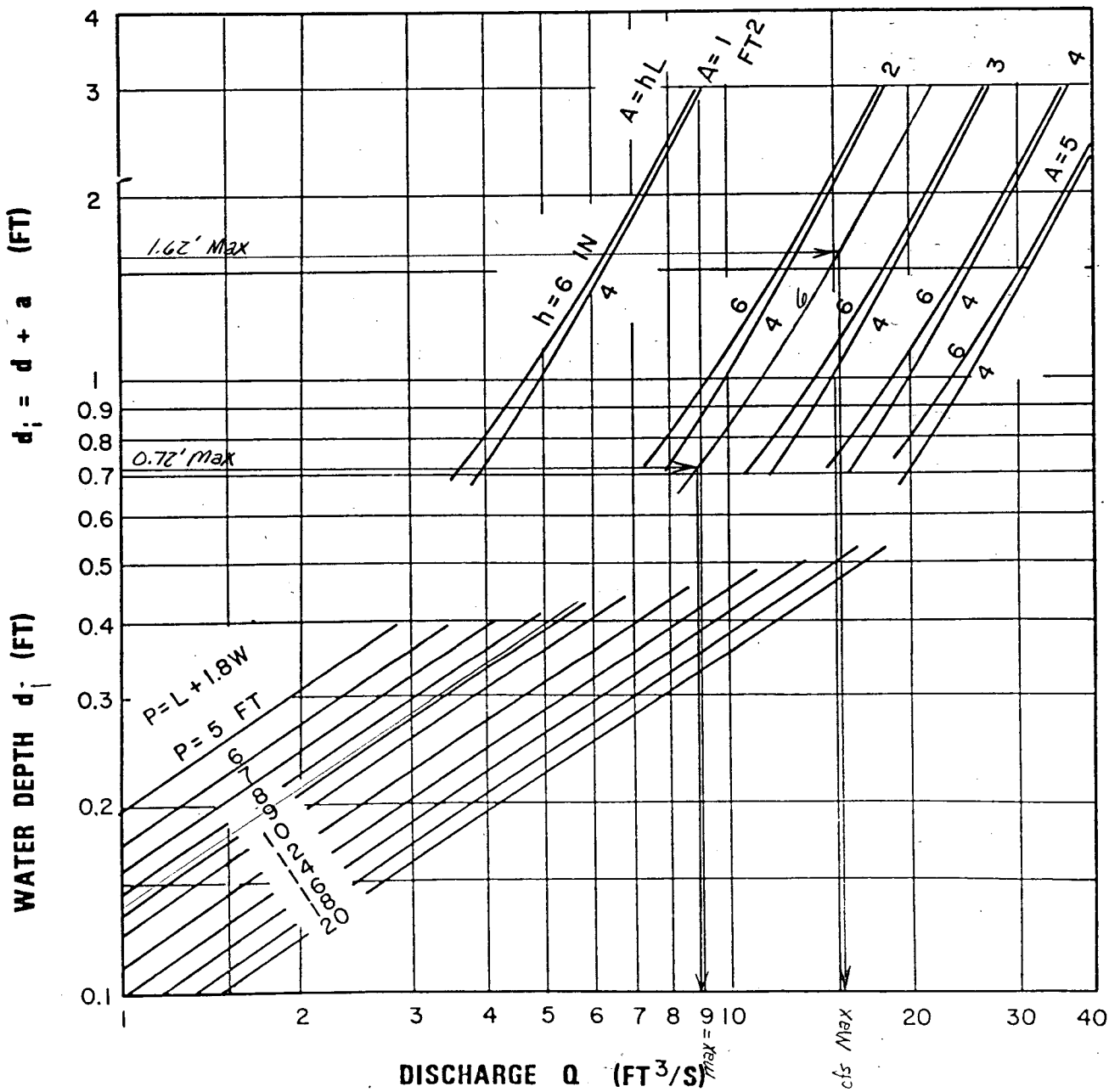
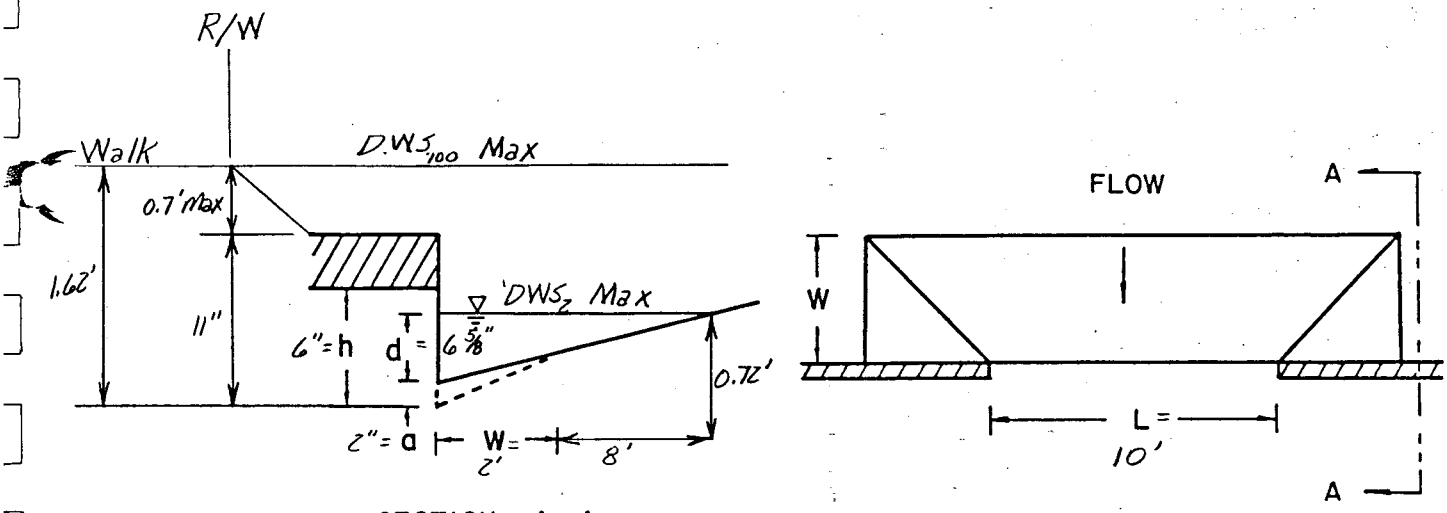


CHART 12. Depressed curb-opening inlet capacity in sump locations.



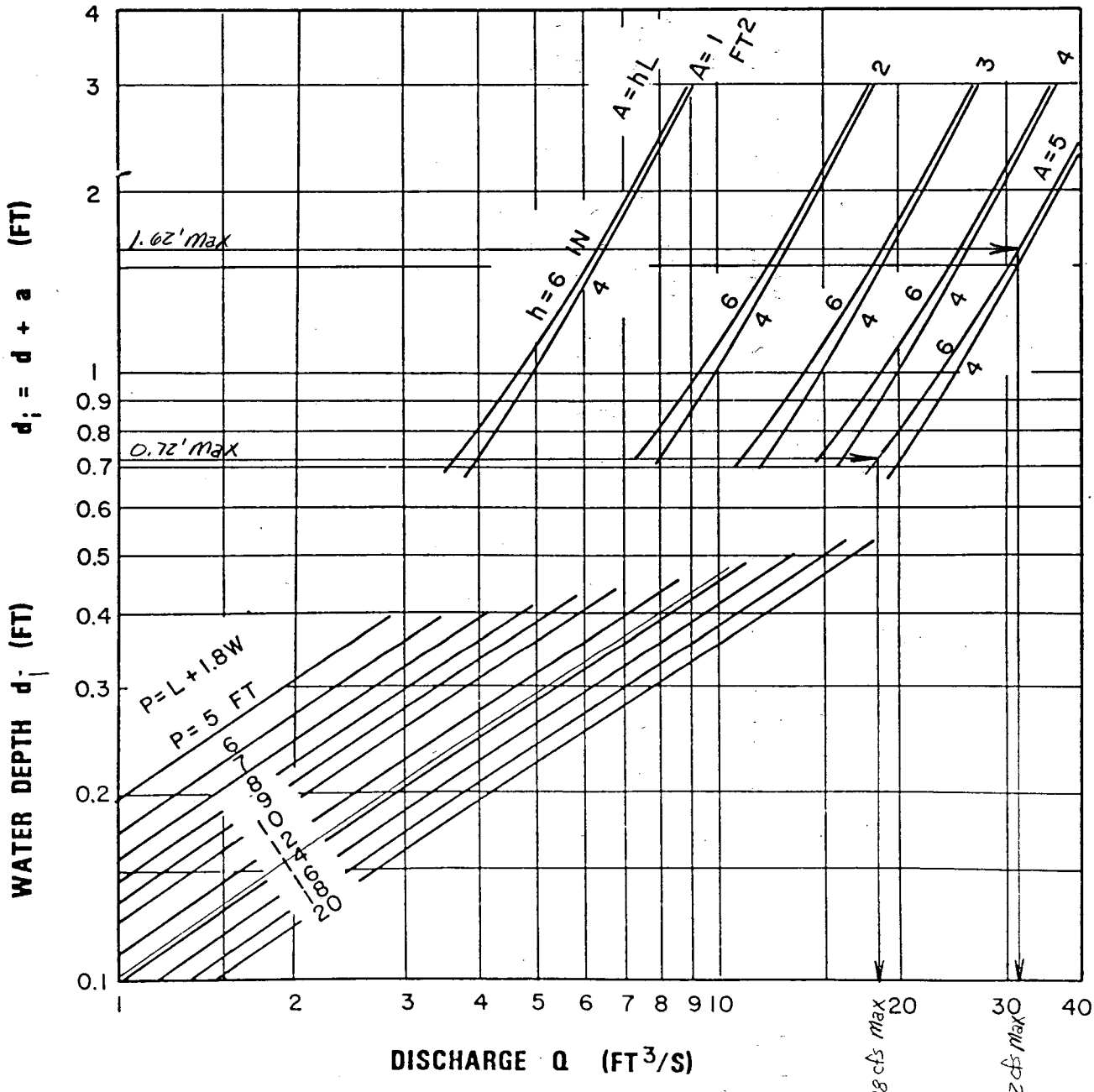


CHART 12. Depressed curb-opening inlet capacity in sump locations.

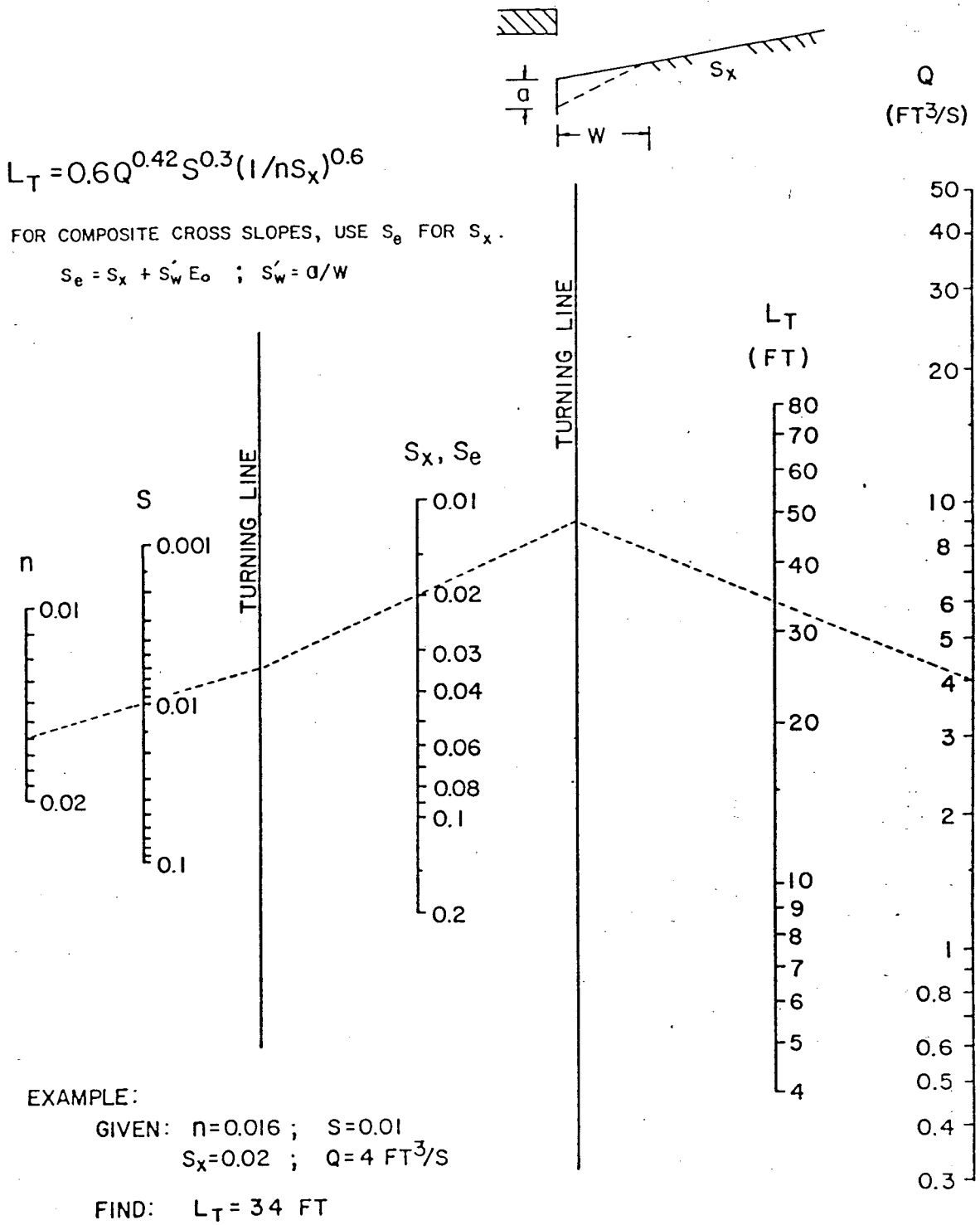


CHART 9. Curb-opening and slotted drain inlet length for total interception.

FROM: HEC-12, DRAINAGE OF HIGHWAY PAVEMENTS, F.H.W.A., MAR. 1969.

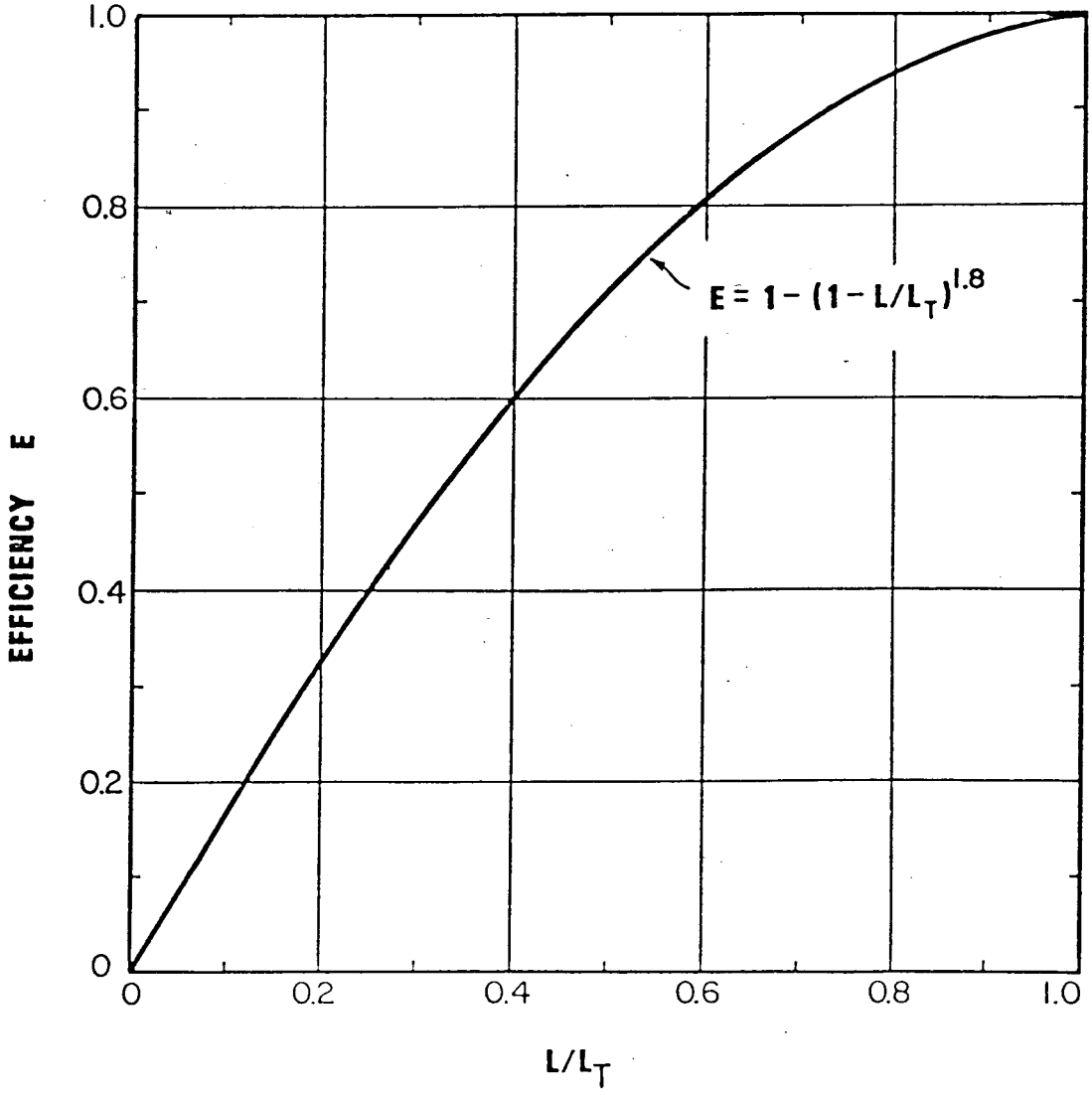


CHART 10. Curb-opening and slotted drain inlet interception efficiency.

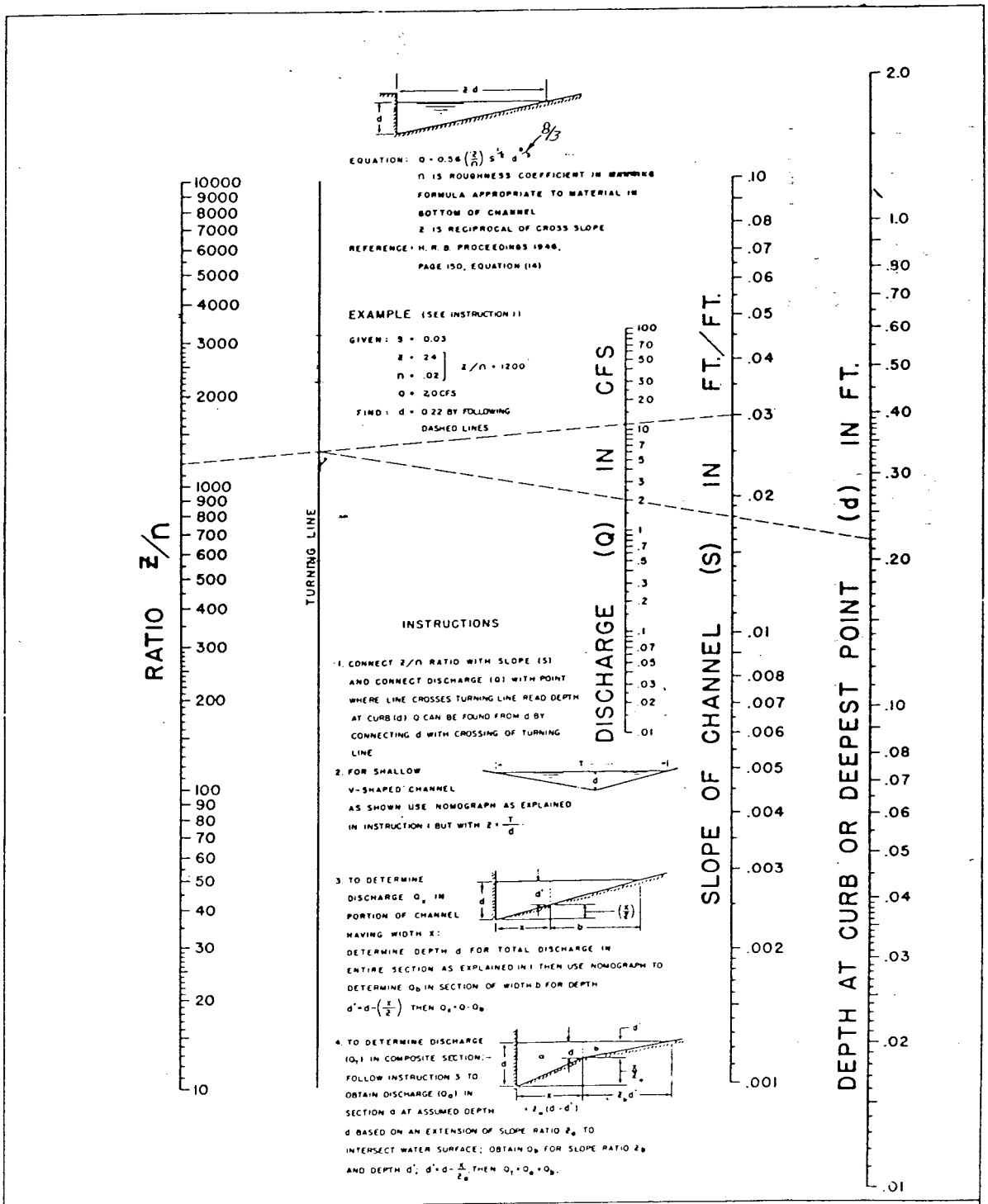
FROM: HEC-12, DRAINAGE OF HIGHWAY PAVEMENTS, F.H.W.A., MAY 1984

x-slope = 3/8"/ft. = 0.03125'/'

z = 1/x-slope = 1/0.03125 = 32

n = 0.016

z/n = 32/0.016 = 2000



BUREAU OF PUBLIC ROADS
REV. JAN. 1968

NOMOGRAPH FOR FLOW IN TRIANGULAR CHANNELS

Sheet flow

Sheet flow is flow over plane surfaces. It usually occurs in the headwater of streams. With sheet flow, the friction value (Manning's n) is an effective roughness coefficient that includes the effect of raindrop impact; drag over the plane surface; obstacles such as litter, crop ridges, and rocks; and erosion and transportation of sediment. These n values are for very shallow flow depths of about 0.1 foot or so. Table 3-1 gives Manning's n values for sheet flow for various surface conditions.

For sheet flow of less than 300 feet, use Manning's kinematic solution (Overton and Meadows 1976) to compute T_t:

$$T_t = \frac{0.007\,(nL)^{0.8}}{(P_2)^{0.5}\,s^{0.4}} \qquad \text{[Eq. 3-3]}$$

Table 3-1.—Roughness coefficients (Manning's n) for sheet flow

Surface description	n[1]
Smooth surfaces (concrete, asphalt, gravel, or bare soil)	0.011
Fallow (no residue)	0.05
Cultivated soils:	
Residue cover ≤20%	0.06
Residue cover >20%	0.17
Grass:	
Short grass prairie	0.15
Dense grasses[2]	0.24
Bermudagrass	0.41
Range (natural)	0.13
Woods:[3]	
Light underbrush	0.40
Dense underbrush	0.80

[1]The n values are a composite of information compiled by Engman (1986).
[2]Includes species such as weeping lovegrass, bluegrass, buffalo grass, blue grama grass, and native grass mixtures.
[3]When selecting n, consider cover to a height of about 0.1 ft. This is the only part of the plant cover that will obstruct sheet flow.

where

T_t = travel time (hr),
n = Manning's roughness coefficient (table 3-1),
L = flow length (ft),
P_2 = 2-year, 24-hour rainfall (in), and
s = slope of hydraulic grade line (land slope, ft/ft).

This simplified form of the Manning's kinematic solution is based on the following: (1) shallow steady uniform flow, (2) constant intensity of rainfall excess (that part of a rain available for runoff), (3) rainfall duration of 24 hours, and (4) minor effect of infiltration on travel time. Rainfall depth can be obtained from appendix B.

Shallow concentrated flow

After a maximum of 300 feet, sheet flow usually becomes shallow concentrated flow. The average velocity for this flow can be determined from figure 3-1, in which average velocity is a function of watercourse slope and type of channel. For slopes less than 0.005 ft/ft, use equations given in appendix F for figure 3-1. Tillage can affect the direction of shallow concentrated flow. Flow may not always be directly down the watershed slope if tillage runs across the slope.

After determining average velocity in figure 3-1, use equation 3-1 to estimate travel time for the shallow concentrated flow segment.

Open channels

Open channels are assumed to begin where surveyed cross section information has been obtained, where channels are visible on aerial photographs, or where blue lines (indicating streams) appear on United States Geological Survey (USGS) quadrangle sheets. Manning's equation or water surface profile information can be used to estimate average flow velocity. Average flow velocity is usually determined for bank-full elevation.

Appendix F: Equations for figures and exhibits

This appendix presents the equations used in procedure applications to generate figures and exhibits in TR-55.

Figure 2-1 (runoff equation):

$$Q = \frac{\left[P - 0.2\left(\frac{1000}{CN} - 10\right)\right]^2}{P + 0.8\left(\frac{1000}{CN} - 10\right)}$$

where

Q = runoff (in),
P = rainfall (in), and
CN = runoff curve number.

Figure 2-3 (composite CN with connected impervious area):

$$CN_c = CN_p + (P_{imp}/100)(98 - CN_p)$$

where

CN_c = composite runoff curve number,
CN_p = pervious runoff curve number, and
P_{imp} = percent imperviousness.

Figure 2-4 (composite CN with unconnected impervious areas and total impervious area less than 30%):

$$CN_c = CN_p + (P_{imp}/100)(98 - CN_p)(1 - 0.5R)$$

where R = ratio of unconnected impervious area to total impervious area.

Figure 3-1 (average velocities for estimating travel time for shallow concentrated flow):

Unpaved $V = 16.1345\ (s)^{0.5}$
Paved $V = 20.3282\ (s)^{0.5}$

where

V = average velocity (ft/s), and
s = slope of hydraulic grade line (watercourse slope, ft/ft).

These two equations are based on the solution of Manning's equation (Eq. 3-4) with different assumptions for n (Manning's roughness coefficient) and r (hydraulic radius, ft). For unpaved areas, n is 0.05 and r is 0.4; for paved areas, n is 0.025 and r is 0.2.

Exhibit 4 (unit peak discharges for SCS type I, IA, II, and III distributions):

$$\log(q_u) = C_0 + C_1 \log(T_c) + C_2 [\log(T_c)]^2$$

where

q_u = unit peak discharge (csm/in),
T_c = time of concentration (hr) (minimum, 0.1; maximum, 10.0), and
C_0, C_1, C_2 = coefficients from table F-1.

Figure 6-1 (approximate detention basin routing through single- and multiple-stage structures for 24-hour rainfalls of the indicated type):

$$V_s/V_r = C_0 + C_1 (q_o/q_i) + C_2 (q_o/q_i)^2 + C_3 (q_o/q_i)^3$$

where

V_s/V_r = ratio of storage volume (V_s) to runoff volume (V_r),
q_o/q_i = ratio of peak outflow discharge (q_o) to peak inflow discharge (q_i), and
C_0, C_1, C_2, C_3 = coefficients from table F-2.

STERLING FARMS 2ND ADDITION

STERLING ST BOX CULVERT TAILWATER EVALUATION

TIME	OFFSITE Q	STAGE POND 2	TAILWATER DEPTH (FT)
1200	163	1348.4	1.9'
1205	207	8.8	2.3'
1210	243	9.3	2.8'
1215	262	9.6	3.1'
1220	264	9.8	3.3'
1225	252	9.9	3.4'
1230	232	9.8	3.3'

USE CONSTANT TAILWATER = 1349.5 TO APPROXIMATE THE TAILWATER CONDITION

USE VALUE OF "OFFSITE" HYDROGRAPH AS DESIGN Q. "BASIN 1" Q_{100} = 15 CFS IS INSIGNIFICANT

CURRENT DATE: 02-11-1993
CURRENT TIME: 22:41:17

FILE DATE: 02-11-1993
FILE NAME: SF2ND

****
********** FHWA CULVERT ANALYSIS **********
********** HY-8, VERSION 3.2 **********
****

CULV #	SITE DATA: INLET ELEV. (FT)	SITE DATA: OUTLET ELEV. (FT)	SITE DATA: CULVERT LENGTH (FT)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (FT)	RISE (FT)	MANNING n	INLET TYPE
1	1346.50	1346.49	200.00	3 RCB	8.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

****

SUMMARY OF CULVERT FLOWS (CFS) FILE: SF2ND DATE: 02-11-1993

ELEV (FT)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
1349.50	0	0	0	0	0	0	0	0	1
1349.51	35	35	0	0	0	0	0	0	1
1349.53	70	70	0	0	0	0	0	0	1
1349.56	105	105	0	0	0	0	0	0	1
1349.61	140	140	0	0	0	0	0	0	1
1349.68	175	175	0	0	0	0	0	0	1
1349.76	210	210	0	0	0	0	0	0	1
1349.85	245	245	0	0	0	0	0	0	1
1349.91	264	264	0	0	0	0	0	0	1
1350.08	315	315	0	0	0	0	0	0	1
1350.21	350	350	0	0	0	0	0	OVERTOPPING	
1351.00	507	507	0	0	0	0			

****

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: SF2ND DATE: 02-11-1993

HEAD ELEV(FT)	HEAD ERROR(FT)	TOTAL FLOW(CFS)	FLOW ERROR(CFS)	% FLOW ERROR
1349.50	0.00	0	0	0.00
1349.51	0.00	35	0	0.00
1349.53	0.00	70	0	0.00
1349.56	0.00	105	0	0.00
1349.61	0.00	140	0	0.00
1349.68	0.00	175	0	0.00
1349.76	0.00	210	0	0.00
1349.85	0.00	245	0	0.00
1349.91	0.00	264	0	0.00
1350.08	0.00	315	0	0.00
1350.21	0.00	350	0	0.00

****

<1> TOLERANCE (FT) = 0.010 <2> TOLERANCE (%) = 1.000

****

CURRENT DATE: 02-11-1993
CURRENT TIME: 22:41:17

FILE DATE: 02-11-1993
FILE NAME: SF2ND

****
********** CULVERT # 1 **********
****

PERFORMANCE CURVE FOR 3 BARREL(S)

Q (cfs)	HWE (ft)	TWE (ft)	ICH (ft)	OCH (ft)	FLOW TYPE	CCE (ft)	FCE (ft)	TCE (ft)	VO (fps)
0	1349.50	1349.50	0.00	3.00	0-NF	0.00	1346.50	0.00	0.00
35	1349.51	1349.50	0.60	3.01	4-FF	0.00	0.00	0.00	0.49
70	1349.53	1349.50	0.96	3.03	4-FF	0.00	0.00	0.00	0.97
105	1349.56	1349.50	1.26	3.06	4-FF	0.00	0.00	0.00	1.46
140	1349.61	1349.50	1.52	3.11	4-FF	0.00	0.00	0.00	1.94
175	1349.68	1349.50	1.78	3.18	4-FF	0.00	0.00	0.00	2.43
210	1349.76	1349.50	2.03	3.26	4-FF	0.00	0.00	0.00	2.92
245	1349.85	1349.50	2.27	3.35	4-FF	0.00	0.00	0.00	3.40
264	1349.91	1349.50	2.39	3.41	4-FF	0.00	0.00	0.00	3.67
315	1350.08	1349.50	2.72	3.58	4-FF	0.00	0.00	0.00	4.38
350	1350.21	1349.50	2.94	3.71	4-FF	0.00	0.00	0.00	4.86

El. inlet face invert 1346.50 ft El. outlet invert 1346.49 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION (FT)	0.00
INLET ELEVATION (FT)	1346.50
OUTLET STATION (FT)	200.00
OUTLET ELEVATION (FT)	1346.49
NUMBER OF BARRELS	3.00
SLOPE (V-FT/H-FT)	0.0001
CULVERT LENGTH ALONG SLOPE (FT)	200.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	8.00 FT
BARREL RISE	3.00 FT
BARREL MATERIAL	CONCRETE
BARREL MANNING'S N	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL (45 DEG. FLARE)
INLET DEPRESSION	NONE

CURRENT DATE: 02-11-1993
CURRENT TIME: 22:41:17

FILE DATE: 02-11-1993
FILE NAME: SF2ND

****
********** TAILWATER **********
****
****

CONSTANT WATER SURFACE ELEVATION
1349.50

****
********** ROADWAY OVERTOPPING DATA **********
****

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH (FT)	60.00
CREST LENGTH (FT)	200.00
OVERTOPPING CREST ELEVATION (FT)	1351.00

****

Sterling Farms 2nd Addition Drainage Plan
Proposed Conditions Hydrologic Model
PEC File 36-92600-2051 2/11/93

Sterling Farms 2nd Addition is a plat lying in the northeast corner of the Southeast Quarter of Section 5, Township 27 South, Range 1 West. This basin has been studied previously in the Drainage Plan for Sterling Farms Addition submitted Nov 4, 1988 and revised Nov. 29, 1988, and in a letter report dated January 30, 1989 submitted with the design of City of Wichita Storm Water Sewer 383. The latter report contained minor revisions to the original report based on field conditions discovered in the design survey and based on final design of the referenced storm sewer. Changes in the hydrologic model from the latest report are as follows:

1. The off-site drainage areas lying east of Tyler Road have been broken into two subareas:

a. A tract lying in the northwest quarter of Sec. 4 presently owned by the Kastens family. This basin is approximately 40 acres. The design condition is assumed to be cultivated land. At the time of development, it is assumed that detention will be required on this site to reduce the discharge to values at or below those assumed in this report, that is, for an existing cultivated conditions. Please note that in the development of the hydrologic model, it was discovered that the hydrograph peak discharges in the watershed downstream are extremely sensitive to the timing of flood peaks. Any detention provided must take into account the timing of flood peak as well as the reduction in runoff. Computation sheets for hydraulic parameters are included in this section directly behind the typewritten narrative.

b. A tract lying in the west portion of the Southwest Quarter of Section 4, which has been partially developed as Reflection Ridge 3rd Addition (single family residential), Reflection Ridge golf course, and Village Charters. This basin was assumed to be fully developed in accordance with the Drainage Plan document submitted with the platting of Reflection Ridge Addition. There is an existing pond on the No. 5 hole adjacent to Tyler Road. In its present condition, it has no functional outlet due to the lack of a suitable outfall to the west. Development of Sterling Farms 2nd Addition may provide an opportunity to construct an outfall and thereby gain some detention storage in the present lake. In this analysis, however, no detention storage was considered to be available. It should be noted that an enlargement of this lake could serve to provide detention not only for Reflection Ridge, but also possibly for the Kastens property mentioned above if sufficient conveyance along the east side of Tyler Road can be provided.

2. The static pool for Pond No. 1 in Sterling Farms has been assumed to be lowered 0.5 ft to 1346.5. Thus, this pond and the pond immediately downstream operate as a single pond. The culvert between Pond Nos. 1 and 2 has been enlarged to a 3-8' x 3' RCBB.

3. The outlet weir for Pond No. 2 has been changed to 30 ft in length.

As an result of the changes in the model stated above, the following impacts to the Sterling Farms development relative to the original design should be noted:

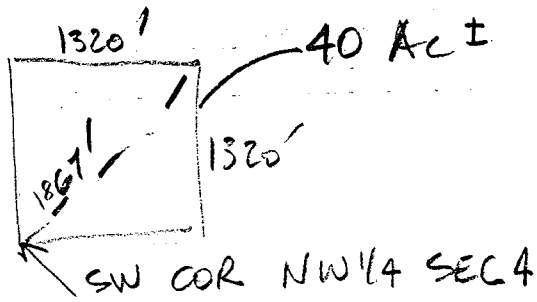
POND #1: The 100-year Design Water Surface (DWS100) dropped from 1350.72 to 1349.86. The 100-year discharge (Q100) from off-site into the pond increased from 197 cfs to 264 cfs.

POND #2: The DWS100 raised from 1348.70 to 1349.86. This does not affect any lots platted to date. The Q100 out of the pond increased from 238 cfs to 332 cfs.

POND #3: The DWS100 raised from 1348.24 to 1348.78, which should be compared to the platted minimum pad elevation of 1350.0 adjacent to this pond. The Q100 into the lake increased from 634 cfs to 720 cfs, and Q100 out increased from 343 cfs to 383 cfs.

POND #4: The DWS100 raised from 1347.77 to 1348.16, which compares to the platted minimum pad elevation adjacent to the lake of 1349.5 The Q100 into the lake increased from 357 cfs to 397 cfs, and the Q100 out increased from 357 cfs to 396 cfs. This discharge is 8.5% more than the original 25-year design discharge of the 2-9' x 3' reinforced concrete box bridge under 21st Street. However, the design headwater is only 0.1 ft higher than that of the original structure. The reader should note that the detention basins provided have reduced the 100-year runoff for fully developed conditions (except the Kastens property) to within 8.5 % of the 25-year discharge for pre-developed conditions.

KASTENS PROPERTY



300' SHEET FLOW
1500' SHALLOW CONC FLOW
600' DITCH FLOW

T_1 SHEET FLOW $n = 0.17$ $S = 0.01$

$$T_1 = \frac{0.007\,(0.17 \times 300)^{0.8}}{\sqrt{3.5}\,(0.01)^{0.4}} = 0.55 \text{ HR}$$

T_2 = SHALLOW CONC FLOW

$$V_2 = 16.1345\sqrt{0.01} = 1.6 \text{ FT/SEC}$$

$$T_2 = \frac{1500 \text{ FT}}{1.6 \text{ FT/SEC}} \times \frac{1 \text{ MIN}}{60 \text{ SEC}} = 15.5 \text{ MIN} = 0.26 \text{ HR}$$

T_3 = DITCH FLOW ASSUME $V = 1$ FT/SEC

$$T_3 = \frac{600}{1} \times \frac{1}{60} = 10 \text{ MIN} = 0.17 \text{ HR}$$

$$T_c = 0.55 + 0.26 + 0.17 = 0.98 \text{ HR SAY } 1 \text{ HR}$$

$$\text{LAG} = 0.6\,T_c = 0.6 \text{ HR}$$

PROFESSIONAL ENGINEERING CONSULTANTS
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Date 2/10/93 MJB Page ____ of ____

Project STERLING FARMS 2ND ADDITION

Item OFF-SITE DRAINAGE

KASTENS PROPERTY (NW 1/4 SEC 4)

DA = 40 Ac = 0.0625

SOIL CLASS B 100%

PROPOSED 1/4 AC LOT SINGLE FAM RES CN = 75

AVAILABLE FALL = 10'

FLOW LENGTH = 2500 FT — FUTURE CURB/GUTTER STS

S_{AVG} = 0.004 FT/FT

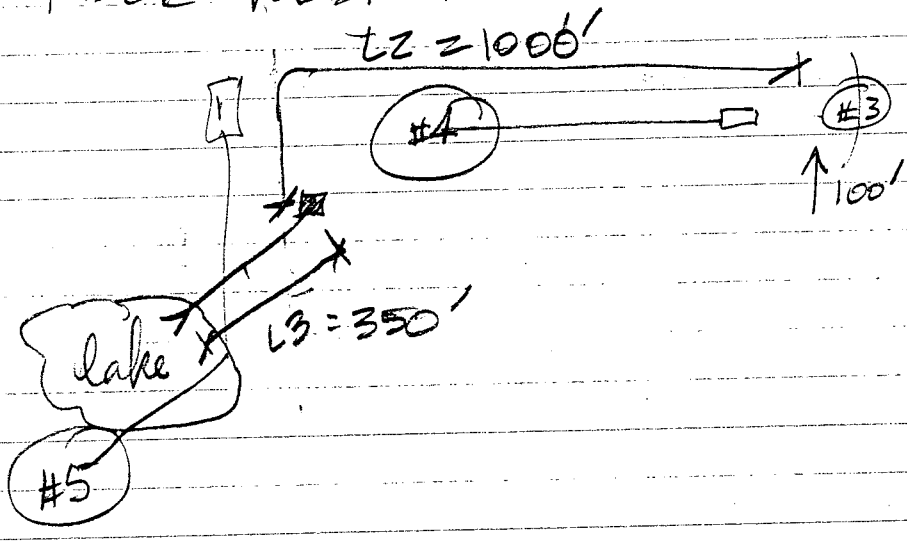
ASSUME 2 FT/SEC GUTTER VELOCITY

$$T_c = \frac{2500 \text{ FT}}{2 \text{ FT/SEC}} \quad \frac{\text{MIN}}{60 \text{ SEC}} = 21 \text{ MIN.}$$

LAG = 0.6 T_c = 0.2 HR

MWB 2/11/93

REFLECTION RIDGE WEST PORTION



T_1 FOR $L_1 = 100'$ Sheet flow

$$T_1 = \frac{0.007(nL)^{0.8}}{\sqrt{P_2}\, S^{0.4}} = \frac{0.007[(0.4)(100)]^{0.8}}{\sqrt{3.5}\,(0.01)^{0.4}} = 0.45 \text{ hr} = 27 \text{ MIN}$$

T_2 FOR $L_2 = 1000'$ Shallow Conc. Flow

$$V = 16.1345\sqrt{0.01} = 1.6 \text{ ft/sec}$$

$$T_2 = \frac{1000'}{1.6} \times \frac{1}{60} = 10 \text{ MIN}$$

T_3 FOR PIPE FLOW ASSUME $V = 6$ FT/SEC FROM "STORM" program

$$T_3 = \frac{L_3}{V_3} = \frac{350'}{6 \text{ FT/SEC}} \times \frac{1}{60} = 1. \text{ MIN}$$

$$T_C = T_1 + T_2 + T_3 = 27 + 10 + 1 = 38 \text{ MIN}$$

LAG $= 0.6\, T_C = 23$ MIN $= 0.38$ HR SAY 0.4 HR

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Date 2/10/93 MJB Page ____ of ____

Project STERLING FARMS 2ND ADD'N

Item OFF-SITE DRAINAGE

REFLECTION RIDGE PROPERTY

INCLUDES NW PORTION VILLAGE CHARTERS

TOTAL AREA = 53 Ac = 0.0828

B SOIL

27.7 Ac OPEN SPACE GOLF COURSE CN = 58

7.2 Ac PATIO HOME ¼ AC LOT (65% IMP) CN = 85

5.6 Ac COMM 85% IMP CN = 92

4.6 + 8.0 = 12.6 Ac ¼ AC RES 38% IMP CN = 75

$$\text{COMPOSITE CN} = \frac{27.7 \times 58 + 7.2 \times 85 + 5.6 \times 92 + 12.6 \times 75}{53} = 69$$

CONSIDER ST/SWS ONLY TO CONTROL.

600 FT STREET @ 2 FT/SEC → 6.7 MIN

500 FT PIPE @ 6 FT/SEC → 1.4 MIN

8.1 MIN

T_c = 8.1 MIN

$L_{ag} = 0.6 T_c$ = 0.08 HR → USE 0.1 HR.

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Date 2-11-93 MJB Page ____ of ____

Project STERLING FARMS 2ND ADD'N

Item POND VOLUMES

POND #1 & POND #2 COMBINED

POND #1 LOWER STATIC POOL = 1346.5

	ELEV	STAGE	POND #1 AREA, Ac	POND #2 AREA, AC	Σ Area Acres
STATIC POOL	1346.5	0	0.2 Ac	2.6 Ac	2.8 Ac
	1347.5	1	0.27 Ac		
TOP BANK	1351.5	5	0.53 AC	3.4 Ac	3.9 Ac

```
*****************************************
*                                       *
*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*             FEBRUARY 1981             *
*           REVISED 02 AUG 88           *
*                                       *
*  RUN DATE  02/11/1993  TIME  22:23:59 *
*                                       *
*****************************************
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*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748              *
*                                       *
*****************************************
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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

HEC-1 INPUT PAGE 1

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

            1       ID    STERLING FARMS 2ND ADDITION DRAINAGE PLAN
            2       ID    PEC PROJECT NO 36-92600-2051
            3       ID    STAGE STORAGE ANALYSIS --- 100 YR
            4       ID    PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
            5       ID    COMPUTED BY M.W.BERRY, P.E.  02/11/93
            6       ID    FILENAME="A:\MISCHEC1\STERFAR2.HEC"  DISKNAME="MWB01"
*** FREE ***
*** LIST ***
                    *DIAGRAM
            7       IT       5 11FEB93     600       0 11FEB93    1800
            8       IO       0       0
            9       IN      30 11FEB93     600

           10       KK  KASTENOFF SITE DRAINAGE - SW /4 NW /4 SEC 4 27 1W - CULTIVATED
           11       BA  0.0625
           12       PB     7.8
           13       PC    0.08    0.09    0.10    0.11    0.12    0.133   0.147   0.163   0.181   0.204
           14       PC   0.235   0.283   0.663   0.735   0.772   0.799   0.820   0.835   0.850   0.865
           15       PC   0.880   0.890   0.900   0.910   0.916   0.925   0.934   0.943   0.952   0.958
           16       PC   0.964   0.970   0.976   0.982   0.988   0.994   1.000
           17       LS       0      71       0
           18       UD    0.60

           19       KK  RRWESTOFF SITE DRAINAGE - WEST PORTION OF REFLECTION RIDGE
           20       BA  0.0828
           21       PB     7.8
           22       PC    0.08    0.09    0.10    0.11    0.12    0.133   0.147   0.163   0.181   0.204
           23       PC   0.235   0.283   0.663   0.735   0.772   0.799   0.820   0.835   0.850   0.865
           24       PC   0.880   0.890   0.900   0.910   0.916   0.925   0.934   0.943   0.952   0.958
           25       PC   0.964   0.970   0.976   0.982   0.988   0.994   1.000
           26       LS       0      69       0
           27       UD    0.40

           28       KK OFFSITE
           29       HC       2       0

           30       KK  BASIN1
           31       BA  0.0047
           32       PB     7.8
           33       PC    0.08    0.09    0.10    0.11    0.12    0.133   0.147   0.163   0.181   0.204
           34       PC   0.235   0.283   0.663   0.735   0.772   0.799   0.820   0.835   0.850   0.865
           35       PC   0.880   0.890   0.900   0.910   0.916   0.925   0.934   0.943   0.952   0.958
           36       PC   0.964   0.970   0.976   0.982   0.988   0.994   1.000
           37       LS       0      79       0
           38       UD    0.25

           39       KK  BASIN2
           40       BA  0.0578
           41       PB     7.8
           42       PC    0.08    0.09    0.10    0.11    0.12    0.133   0.147   0.163   0.181   0.204
           43       PC   0.235   0.283   0.663   0.735   0.772   0.799   0.820   0.835   0.850   0.865
           44       PC   0.880   0.890   0.900   0.910   0.916   0.925   0.934   0.943   0.952   0.958
           45       PC   0.964   0.970   0.976   0.982   0.988   0.994   1.000
           46       LS       0      81       0
           47       UD    0.25
```

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

  48      KK  INTO2
  49      HC      3

  50      KK  PON1$2
          *  pond #1 static pool lowered to 1346.5
          *  pond #1 & #2 combined to function together
  51      RS      1    ELEV  1346.5
  52      SA    2.8     3.9
  53      SE  1346.5  1351.5
          * note: cofq=1.8 for submergence correction
  54      SS  1346.5    30.0     1.8     1.5

  55      KK  BASIN3
  56      BA   0.150
  57      PB     7.8
  58      PC    0.08    0.09    0.10    0.11    0.12    0.133   0.147   0.163   0.181   0.204
  59      PC   0.235   0.283   0.663   0.735   0.772   0.799   0.820   0.835   0.850   0.865
  60      PC   0.880   0.890   0.900   0.910   0.916   0.925   0.934   0.943   0.952   0.958
  61      PC   0.964   0.970   0.976   0.982   0.988   0.994   1.000
  62      LS       0      82       0
  63      UD    0.25

  64      KK   INTO3
  65      HC      2

  66      KK   POND3
  67      RS      1    ELEV    1345
  68      SV      0       8      16      23      31      35
  69      SQ      0      40     220     325     400     440
  70      SE  1344.7  1346.0  1347.0  1348.0  1349.0  1349.5

  71      KK  BASIN4
  72      BA  0.0188
  73      PB     7.8
  74      PC    0.08    0.09    0.10    0.11    0.12    0.133   0.147   0.163   0.181   0.204
  75      PC   0.235   0.283   0.663   0.735   0.772   0.799   0.820   0.835   0.850   0.865
  76      PC   0.880   0.890   0.900   0.910   0.916   0.925   0.934   0.943   0.952   0.958
  77      PC   0.964   0.970   0.976   0.982   0.988   0.994   1.000
  78      LS       0      76       0
  79      UD    0.25

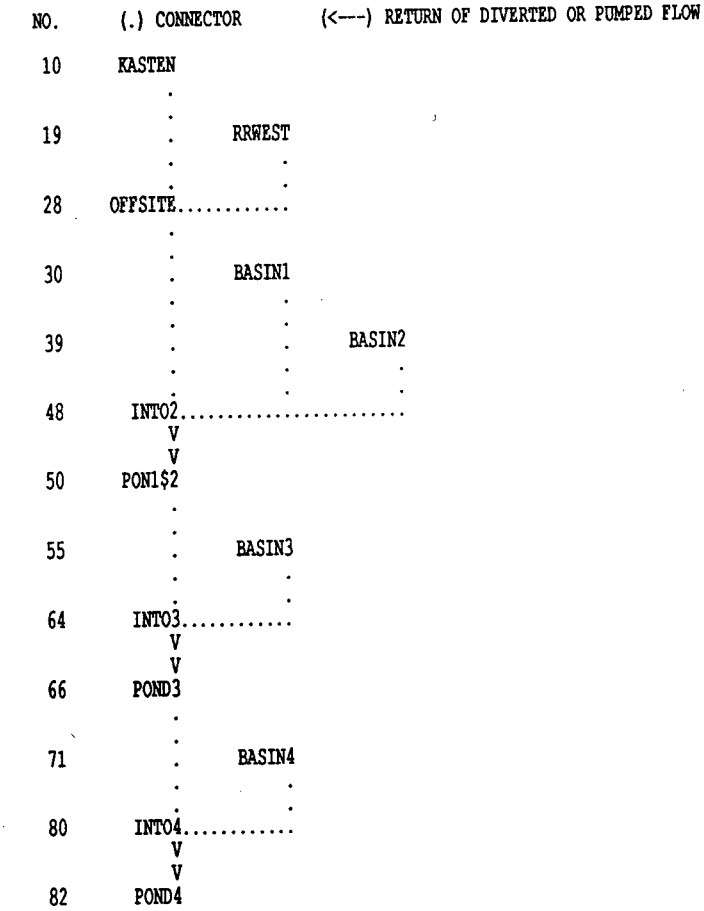
  80      KK   INTO4
  81      HC      2

  82      KK   POND4
  83      RS      1    ELEV  1344.7
  84      SV    0.0     0.6     1.1     1.7     2.3     2.8
  85      SQ      0      40     210     350     450     530
  86      SE  1344.7  1345.7  1346.7  1347.7  1348.7  1349.7
  87      ZZ
```

SCHEMATIC DIAGRAM OF STREAM NETWORK

INPUT LINE NO.

(V) ROUTING (.) CONNECTOR (---->) DIVERSION OR PUMP FLOW (<----) RETURN OF DIVERTED OR PUMPED FLOW



(***) RUNOFF ALSO COMPUTED AT THIS LOCATION

```
*****************************************
*                                       *
*  FLOOD HYDROGRAPH PACKAGE  (HEC-1)    *
*            FEBRUARY 1981              *
*          REVISED 02 AUG 88            *
*                                       *
*  RUN DATE  02/11/1993  TIME  22:23:59 *
*                                       *
*****************************************
```


```
*****************************************
*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*  THE HYDROLOGIC ENGINEERING CENTER    *
*          609 SECOND STREET            *
*        DAVIS, CALIFORNIA 95616        *
*           (916) 551-1748              *
*                                       *
*****************************************
```


STERLING FARMS 2ND ADDITION DRAINAGE PLAN
PEC PROJECT NO 36-92600-2051
STAGE STORAGE ANALYSIS --- 100 YR
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
COMPUTED BY M.W.BERRY, P.E. 02/11/93
FILENAME="A:\MISCHEC1\STERFAR2.HEC" DISKNAME="MWB01"

8 IO OUTPUT CONTROL VARIABLES

IPRNT	0	PRINT CONTROL
IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

NMIN	5	MINUTES IN COMPUTATION INTERVAL
IDATE	11FEB93	STARTING DATE
ITIME	0600	STARTING TIME
NQ	145	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	11FEB93	ENDING DATE
NDTIME	1800	ENDING TIME
ICENT	19	CENTURY MARK

COMPUTATION INTERVAL .08 HOURS
TOTAL TIME BASE 12.00 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

*** ***

```
***************
*             *
*   KASTEN    *
*             *
***************
```

10 KK OFF SITE DRAINAGE - SW /4 NW /4 SEC 4 27 1W - CULTIVATED

9 IN TIME DATA FOR INPUT TIME SERIES

JXMIN	30	TIME INTERVAL IN MINUTES
JXDATE	11FEB93	STARTING DATE
JXTIME	600	STARTING TIME

SUBBASIN RUNOFF DATA

11 BA SUBBASIN CHARACTERISTICS
TAREA .06 SUBBASIN AREA

PRECIPITATION DATA

12 PB STORM 7.80 BASIN TOTAL PRECIPITATION

13 PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.06	.06	.06	.06

.06	.06	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00						

17 LS SCS LOSS RATE

STRTL	.82	INITIAL ABSTRACTION
CRVNBR	71.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

18 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.60 LAG

***

UNIT HYDROGRAPH
38 END-OF-PERIOD ORDINATES

2.	7.	14.	24.	35.	43.	47.	47.	45.	41.
35.	29.	22.	18.	14.	12.	10.	8.	6.	5.
4.	3.	3.	2.	2.	1.	1.	1.	1.	1.
1.	0.	0.	0.	0.	0.	0.	0.		

HYDROGRAPH AT STATION KASTEN

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
11 FEB 0600	1	.00	.00	.00	0.
11 FEB 0605	2	.02	.02	.00	0.
11 FEB 0610	3	.02	.02	.00	0.
11 FEB 0615	4	.02	.02	.00	0.
11 FEB 0620	5	.02	.02	.00	0.
11 FEB 0625	6	.02	.02	.00	0.
11 FEB 0630	7	.02	.02	.00	0.
11 FEB 0635	8	.02	.02	.00	0.
11 FEB 0640	9	.02	.02	.00	0.
11 FEB 0645	10	.02	.02	.00	0.
11 FEB 0650	11	.02	.02	.00	0.
11 FEB 0655	12	.02	.02	.00	0.
11 FEB 0700	13	.02	.02	.00	0.
11 FEB 0705	14	.02	.02	.00	0.
11 FEB 0710	15	.02	.02	.00	0.
11 FEB 0715	16	.02	.02	.00	0.
11 FEB 0720	17	.02	.02	.00	0.
11 FEB 0725	18	.02	.02	.00	0.
11 FEB 0730	19	.02	.02	.00	0.
11 FEB 0735	20	.02	.02	.00	0.
11 FEB 0740	21	.02	.02	.00	0.
11 FEB 0745	22	.02	.02	.00	0.
11 FEB 0750	23	.02	.02	.00	0.
11 FEB 0755	24	.02	.02	.00	0.
11 FEB 0800	25	.02	.02	.00	0.
11 FEB 0805	26	.02	.02	.00	0.
11 FEB 0810	27	.02	.02	.00	0.
11 FEB 0815	28	.02	.02	.00	0.
11 FEB 0820	29	.02	.02	.00	0.
11 FEB 0825	30	.02	.02	.00	0.
11 FEB 0830	31	.02	.02	.00	0.
11 FEB 0835	32	.02	.02	.00	0.
11 FEB 0840	33	.02	.02	.00	0.
11 FEB 0845	34	.02	.02	.00	0.
11 FEB 0850	35	.02	.02	.00	0.
11 FEB 0855	36	.02	.02	.00	0.
11 FEB 0900	37	.02	.02	.00	0.
11 FEB 0905	38	.02	.02	.00	0.
11 FEB 0910	39	.02	.02	.00	0.
11 FEB 0915	40	.02	.02	.00	0.
11 FEB 0920	41	.02	.02	.00	0.
11 FEB 0925	42	.02	.02	.00	0.
11 FEB 0930	43	.02	.02	.00	0.
11 FEB 0935	44	.03	.03	.00	0.
11 FEB 0940	45	.03	.03	.00	0.
11 FEB 0945	46	.03	.03	.00	0.
11 FEB 1205	74	.11	.02	.09	64.
11 FEB 1210	75	.11	.02	.09	79.
11 FEB 1215	76	.11	.02	.09	93.
11 FEB 1220	77	.11	.02	.09	103.
11 FEB 1225	78	.11	.02	.09	107.
11 FEB 1230	79	.11	.02	.09	106.
11 FEB 1235	80	.06	.01	.05	102.
11 FEB 1240	81	.06	.01	.05	95.
11 FEB 1245	82	.06	.01	.05	86.
11 FEB 1250	83	.06	.01	.05	78.
11 FEB 1255	84	.06	.01	.05	69.
11 FEB 1300	85	.06	.01	.05	61.
11 FEB 1305	86	.04	.01	.03	55.
11 FEB 1310	87	.04	.01	.03	49.
11 FEB 1315	88	.04	.01	.03	44.
11 FEB 1320	89	.04	.01	.03	40.
11 FEB 1325	90	.04	.01	.03	36.
11 FEB 1330	91	.04	.01	.03	33.
11 FEB 1335	92	.03	.01	.03	30.
11 FEB 1340	93	.03	.01	.03	28.
11 FEB 1345	94	.03	.01	.03	25.
11 FEB 1350	95	.03	.01	.03	24.
11 FEB 1355	96	.03	.01	.03	22.
11 FEB 1400	97	.03	.01	.03	21.
11 FEB 1405	98	.02	.00	.02	19.
11 FEB 1410	99	.02	.00	.02	18.
11 FEB 1415	100	.02	.00	.02	17.
11 FEB 1420	101	.02	.00	.02	16.
11 FEB 1425	102	.02	.00	.02	15.
11 FEB 1430	103	.02	.00	.02	14.
11 FEB 1435	104	.02	.00	.02	14.
11 FEB 1440	105	.02	.00	.02	13.
11 FEB 1445	106	.02	.00	.02	12.
11 FEB 1450	107	.02	.00	.02	12.
11 FEB 1455	108	.02	.00	.02	11.
11 FEB 1500	109	.02	.00	.02	11.
11 FEB 1505	110	.02	.00	.02	11.
11 FEB 1510	111	.02	.00	.02	10.
11 FEB 1515	112	.02	.00	.02	10.
11 FEB 1520	113	.02	.00	.02	10.
11 FEB 1525	114	.02	.00	.02	10.
11 FEB 1530	115	.02	.00	.02	10.
11 FEB 1535	116	.02	.00	.02	10.
11 FEB 1540	117	.02	.00	.02	10.
11 FEB 1545	118	.02	.00	.02	10.
11 FEB 1550	119	.02	.00	.02	10.

11 FEB 0950	47	.03	.03	.00	0.	*	11 FEB 1555	120	.02	.00	.02	10.
11 FEB 0955	48	.03	.03	.00	0.	*	11 FEB 1600	121	.02	.00	.02	10.
11 FEB 1000	49	.03	.03	.00	0.	*	11 FEB 1605	122	.02	.00	.01	10.
11 FEB 1005	50	.04	.03	.00	0.	*	11 FEB 1610	123	.02	.00	.01	10.
11 FEB 1010	51	.04	.03	.00	0.	*	11 FEB 1615	124	.02	.00	.01	9.
11 FEB 1015	52	.04	.03	.00	0.	*	11 FEB 1620	125	.02	.00	.01	9.
11 FEB 1020	53	.04	.03	.00	0.	*	11 FEB 1625	126	.02	.00	.01	9.
11 FEB 1025	54	.04	.03	.00	0.	*	11 FEB 1630	127	.02	.00	.01	9.
11 FEB 1030	55	.04	.03	.01	1.	*	11 FEB 1635	128	.02	.00	.01	9.
11 FEB 1035	56	.05	.04	.01	1.	*	11 FEB 1640	129	.02	.00	.01	8.
11 FEB 1040	57	.05	.04	.01	1.	*	11 FEB 1645	130	.02	.00	.01	8.
11 FEB 1045	58	.05	.04	.01	1.	*	11 FEB 1650	131	.02	.00	.01	8.
11 FEB 1050	59	.05	.04	.01	1.	*	11 FEB 1655	132	.02	.00	.01	7.
11 FEB 1055	60	.05	.04	.01	2.	*	11 FEB 1700	133	.02	.00	.01	7.
11 FEB 1100	61	.05	.04	.01	2.	*	11 FEB 1705	134	.02	.00	.01	7.
11 FEB 1105	62	.07	.06	.02	2.	*	11 FEB 1710	135	.02	.00	.01	7.
11 FEB 1110	63	.07	.05	.02	3.	*	11 FEB 1715	136	.02	.00	.01	7.
11 FEB 1115	64	.07	.05	.02	3.	*	11 FEB 1720	137	.02	.00	.01	7.
11 FEB 1120	65	.07	.05	.02	4.	*	11 FEB 1725	138	.02	.00	.01	7.
11 FEB 1125	66	.07	.05	.03	5.	*	11 FEB 1730	139	.02	.00	.01	7.
11 FEB 1130	67	.07	.05	.03	5.	*	11 FEB 1735	140	.01	.00	.01	7.
11 FEB 1135	68	.59	.33	.26	7.	*	11 FEB 1740	141	.01	.00	.01	7.
11 FEB 1140	69	.59	.27	.32	10.	*	11 FEB 1745	142	.01	.00	.01	6.
11 FEB 1145	70	.59	.22	.37	14.	*	11 FEB 1750	143	.01	.00	.01	6.
11 FEB 1150	71	.59	.19	.40	22.	*	11 FEB 1755	144	.01	.00	.01	6.
11 FEB 1155	72	.59	.16	.43	33.	*	11 FEB 1800	145	.01	.00	.01	6.
11 FEB 1200	73	.59	.14	.45	48.	*						

****

TOTAL RAINFALL = 7.80, TOTAL LOSS = 3.39, TOTAL EXCESS = 4.41

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	12.00-HR
+	(CFS)	(HR)	(CFS)				
+	107.	6.42		28.	14.	14.	14.
			(INCHES)	4.168	4.308	4.308	4.308
			(AC-FT)	14.	14.	14.	14.

CUMULATIVE AREA = .06 SQ MI

*** ***

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          **************
          *            *
 19 KK    *   RRWEST   *    OFF SITE DRAINAGE - WEST PORTION OF REFLECTION RIDGE
          *            *
          **************

  9 IN        TIME DATA FOR INPUT TIME SERIES
                   JXMIN        30  TIME INTERVAL IN MINUTES
                  JXDATE    11FEB93  STARTING DATE
                  JXTIME       600  STARTING TIME

            SUBBASIN RUNOFF DATA

 20 BA        SUBBASIN CHARACTERISTICS
                  TAREA        .08  SUBBASIN AREA

            PRECIPITATION DATA

 21 PB             STORM       7.80  BASIN TOTAL PRECIPITATION

 22 PI       INCREMENTAL PRECIPITATION PATTERN
               .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
               .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
               .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
               .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
               .00   .00   .00   .00   .00   .00   .00   .01   .01   .01
               .00   .00   .00   .00   .01   .01   .01   .06   .06   .06
               .01   .01   .01   .01   .01   .01   .01   .01   .01   .01
               .06   .06   .01   .01   .01   .00   .00   .00   .00   .00
               .01   .01   .01   .01   .00   .00   .00   .00   .00   .00
               .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
               .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
```

```
   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
   .00   .00   .00   .00   .00   .00   .00   .00   .00   .00
   .00   .00   .00   .00
```

26 LS SCS LOSS RATE

STRTL	.90	INITIAL ABSTRACTION
CRVNBR	69.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

27 UD SCS DIMENSIONLESS UNITGRAPH

TLAG	.40 LAG

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UNIT HYDROGRAPH
26 END-OF-PERIOD ORDINATES

```
   8.   26.   54.   80.   90.   88.   76.   61.   42.   31.
  23.   17.   12.    9.    7.    5.    4.    3.    2.    1.
   1.    1.    1.    0.    0.    0.
```

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HYDROGRAPH AT STATION RRWEST

****

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
11 FEB 0600	1	.00	.00	.00	0.	11 FEB 1205	74	.11	.03	.08	144.
11 FEB 0605	2	.02	.02	.00	0.	11 FEB 1210	75	.11	.03	.09	164.
11 FEB 0610	3	.02	.02	.00	0.	11 FEB 1215	76	.11	.03	.09	169.
11 FEB 0615	4	.02	.02	.00	0.	11 FEB 1220	77	.11	.03	.09	161.
11 FEB 0620	5	.02	.02	.00	0.	11 FEB 1225	78	.11	.02	.09	145.
11 FEB 0625	6	.02	.02	.00	0.	11 FEB 1230	79	.11	.02	.09	126.
11 FEB 0630	7	.02	.02	.00	0.	11 FEB 1235	80	.06	.01	.05	108.
11 FEB 0635	8	.02	.02	.00	0.	11 FEB 1240	81	.06	.01	.05	92.
11 FEB 0640	9	.02	.02	.00	0.	11 FEB 1245	82	.06	.01	.05	80.
11 FEB 0645	10	.02	.02	.00	0.	11 FEB 1250	83	.06	.01	.05	69.
11 FEB 0650	11	.02	.02	.00	0.	11 FEB 1255	84	.06	.01	.05	60.
11 FEB 0655	12	.02	.02	.00	0.	11 FEB 1300	85	.06	.01	.05	53.
11 FEB 0700	13	.02	.02	.00	0.	11 FEB 1305	86	.04	.01	.03	46.
11 FEB 0705	14	.02	.02	.00	0.	11 FEB 1310	87	.04	.01	.03	41.
11 FEB 0710	15	.02	.02	.00	0.	11 FEB 1315	88	.04	.01	.03	37.
11 FEB 0715	16	.02	.02	.00	0.	11 FEB 1320	89	.04	.01	.03	34.
11 FEB 0720	17	.02	.02	.00	0.	11 FEB 1325	90	.04	.01	.03	31.
11 FEB 0725	18	.02	.02	.00	0.	11 FEB 1330	91	.04	.01	.03	29.
11 FEB 0730	19	.02	.02	.00	0.	11 FEB 1335	92	.03	.01	.03	27.
11 FEB 0735	20	.02	.02	.00	0.	11 FEB 1340	93	.03	.01	.03	25.
11 FEB 0740	21	.02	.02	.00	0.	11 FEB 1345	94	.03	.01	.03	24.
11 FEB 0745	22	.02	.02	.00	0.	11 FEB 1350	95	.03	.01	.03	22.
11 FEB 0750	23	.02	.02	.00	0.	11 FEB 1355	96	.03	.01	.03	21.
11 FEB 0755	24	.02	.02	.00	0.	11 FEB 1400	97	.03	.01	.03	20.
11 FEB 0800	25	.02	.02	.00	0.	11 FEB 1405	98	.02	.00	.02	19.
11 FEB 0805	26	.02	.02	.00	0.	11 FEB 1410	99	.02	.00	.02	18.
11 FEB 0810	27	.02	.02	.00	0.	11 FEB 1415	100	.02	.00	.02	18.
11 FEB 0815	28	.02	.02	.00	0.	11 FEB 1420	101	.02	.00	.02	17.
11 FEB 0820	29	.02	.02	.00	0.	11 FEB 1425	102	.02	.00	.02	16.
11 FEB 0825	30	.02	.02	.00	0.	11 FEB 1430	103	.02	.00	.02	15.
11 FEB 0830	31	.02	.02	.00	0.	11 FEB 1435	104	.02	.00	.02	14.
11 FEB 0835	32	.02	.02	.00	0.	11 FEB 1440	105	.02	.00	.02	14.
11 FEB 0840	33	.02	.02	.00	0.	11 FEB 1445	106	.02	.00	.02	13.
11 FEB 0845	34	.02	.02	.00	0.	11 FEB 1450	107	.02	.00	.02	13.
11 FEB 0850	35	.02	.02	.00	0.	11 FEB 1455	108	.02	.00	.02	13.
11 FEB 0855	36	.02	.02	.00	0.	11 FEB 1500	109	.02	.00	.02	13.
11 FEB 0900	37	.02	.02	.00	0.	11 FEB 1505	110	.02	.00	.02	13.
11 FEB 0905	38	.02	.02	.00	0.	11 FEB 1510	111	.02	.00	.02	13.
11 FEB 0910	39	.02	.02	.00	0.	11 FEB 1515	112	.02	.00	.02	12.
11 FEB 0915	40	.02	.02	.00	0.	11 FEB 1520	113	.02	.00	.02	12.
11 FEB 0920	41	.02	.02	.00	0.	11 FEB 1525	114	.02	.00	.02	12.
11 FEB 0925	42	.02	.02	.00	0.	11 FEB 1530	115	.02	.00	.02	12.
11 FEB 0930	43	.02	.02	.00	0.	11 FEB 1535	116	.02	.00	.02	12.
11 FEB 0935	44	.03	.03	.00	0.	11 FEB 1540	117	.02	.00	.02	12.
11 FEB 0940	45	.03	.03	.00	0.	11 FEB 1545	118	.02	.00	.02	12.
11 FEB 0945	46	.03	.03	.00	0.	11 FEB 1550	119	.02	.00	.02	12.
11 FEB 0950	47	.03	.03	.00	0.	11 FEB 1555	120	.02	.00	.02	12.
11 FEB 0955	48	.03	.03	.00	0.	11 FEB 1600	121	.02	.00	.02	12.
11 FEB 1000	49	.03	.03	.00	0.	11 FEB 1605	122	.02	.00	.01	12.
11 FEB 1005	50	.04	.03	.00	0.	11 FEB 1610	123	.02	.00	.01	12.
11 FEB 1010	51	.04	.03	.00	0.	11 FEB 1615	124	.02	.00	.01	12.

11 FEB 1015	52	.04	.03	.00	0.	*	11 FEB 1620	125	.02	.00	.01	11.
11 FEB 1020	53	.04	.03	.00	0.	*	11 FEB 1625	126	.02	.00	.01	11.
11 FEB 1025	54	.04	.03	.00	0.	*	11 FEB 1630	127	.02	.00	.01	10.
11 FEB 1030	55	.04	.03	.00	1.	*	11 FEB 1635	128	.02	.00	.01	10.
11 FEB 1035	56	.05	.04	.01	1.	*	11 FEB 1640	129	.02	.00	.01	9.
11 FEB 1040	57	.05	.04	.01	1.	*	11 FEB 1645	130	.02	.00	.01	9.
11 FEB 1045	58	.05	.04	.01	2.	*	11 FEB 1650	131	.02	.00	.01	9.
11 FEB 1050	59	.05	.04	.01	2.	*	11 FEB 1655	132	.02	.00	.01	9.
11 FEB 1055	60	.05	.04	.01	3.	*	11 FEB 1700	133	.02	.00	.01	9.
11 FEB 1100	61	.05	.04	.01	3.	*	11 FEB 1705	134	.02	.00	.01	9.
11 FEB 1105	62	.07	.06	.02	4.	*	11 FEB 1710	135	.02	.00	.01	9.
11 FEB 1110	63	.07	.06	.02	4.	*	11 FEB 1715	136	.02	.00	.01	8.
11 FEB 1115	64	.07	.06	.02	5.	*	11 FEB 1720	137	.02	.00	.01	8.
11 FEB 1120	65	.07	.05	.02	6.	*	11 FEB 1725	138	.02	.00	.01	8.
11 FEB 1125	66	.07	.05	.02	7.	*	11 FEB 1730	139	.02	.00	.01	8.
11 FEB 1130	67	.07	.05	.02	9.	*	11 FEB 1735	140	.01	.00	.01	8.
11 FEB 1135	68	.59	.36	.23	12.	*	11 FEB 1740	141	.01	.00	.01	8.
11 FEB 1140	69	.59	.29	.30	19.	*	11 FEB 1745	142	.01	.00	.01	8.
11 FEB 1145	70	.59	.25	.34	33.	*	11 FEB 1750	143	.01	.00	.01	8.
11 FEB 1150	71	.59	.21	.38	55.	*	11 FEB 1755	144	.01	.00	.01	7.
11 FEB 1155	72	.59	.18	.41	84.	*	11 FEB 1800	145	.01	.00	.01	7.
11 FEB 1200	73	.59	.16	.43	115.	*						

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TOTAL RAINFALL = 7.80, TOTAL LOSS = 3.62, TOTAL EXCESS = 4.18

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	12.00-HR
+	(CFS)	(HR)	(CFS)				
+	169.	6.25		35.	18.	18.	18.
			(INCHES)	3.981	4.122	4.122	4.122
			(AC-FT)	18.	18.	18.	18.

CUMULATIVE AREA = .08 SQ MI

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28 KK

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*            *
*  OFFSITE   *
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29 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION OFFSITE
SUM OF 2 HYDROGRAPHS

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DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW	*	DA MON HRMN	ORD	FLOW
11 FEB 0600	1	0.	*	11 FEB 0905	38	0.	*	11 FEB 1210	75	243.	*	11 FEB 1515	112	23.
11 FEB 0605	2	0.	*	11 FEB 0910	39	0.	*	11 FEB 1215	76	262.	*	11 FEB 1520	113	23.
11 FEB 0610	3	0.	*	11 FEB 0915	40	0.	*	11 FEB 1220	77	264.	*	11 FEB 1525	114	22.
11 FEB 0615	4	0.	*	11 FEB 0920	41	0.	*	11 FEB 1225	78	252.	*	11 FEB 1530	115	22.
11 FEB 0620	5	0.	*	11 FEB 0925	42	0.	*	11 FEB 1230	79	232.	*	11 FEB 1535	116	22.
11 FEB 0625	6	0.	*	11 FEB 0930	43	0.	*	11 FEB 1235	80	209.	*	11 FEB 1540	117	22.
11 FEB 0630	7	0.	*	11 FEB 0935	44	0.	*	11 FEB 1240	81	186.	*	11 FEB 1545	118	22.
11 FEB 0635	8	0.	*	11 FEB 0940	45	0.	*	11 FEB 1245	82	166.	*	11 FEB 1550	119	22.
11 FEB 0640	9	0.	*	11 FEB 0945	46	0.	*	11 FEB 1250	83	147.	*	11 FEB 1555	120	22.
11 FEB 0645	10	0.	*	11 FEB 0950	47	0.	*	11 FEB 1255	84	129.	*	11 FEB 1600	121	22.
11 FEB 0650	11	0.	*	11 FEB 0955	48	0.	*	11 FEB 1300	85	114.	*	11 FEB 1605	122	22.
11 FEB 0655	12	0.	*	11 FEB 1000	49	0.	*	11 FEB 1305	86	101.	*	11 FEB 1610	123	22.
11 FEB 0700	13	0.	*	11 FEB 1005	50	0.	*	11 FEB 1310	87	91.	*	11 FEB 1615	124	21.
11 FEB 0705	14	0.	*	11 FEB 1010	51	0.	*	11 FEB 1315	88	82.	*	11 FEB 1620	125	21.
11 FEB 0710	15	0.	*	11 FEB 1015	52	0.	*	11 FEB 1320	89	74.	*	11 FEB 1625	126	20.
11 FEB 0715	16	0.	*	11 FEB 1020	53	1.	*	11 FEB 1325	90	67.	*	11 FEB 1630	127	19.
11 FEB 0720	17	0.	*	11 FEB 1025	54	1.	*	11 FEB 1330	91	62.	*	11 FEB 1635	128	18.

11 FEB 0725	18	0.	*	11 FEB 1030	55	1.	*	11 FEB 1335	92	57.	*	11 FEB 1640	129	18.					
11 FEB 0730	19	0.	*	11 FEB 1035	56	2.	*	11 FEB 1340	93	53.	*	11 FEB 1645	130	17.					
11 FEB 0735	20	0.	*	11 FEB 1040	57	2.	*	11 FEB 1345	94	49.	*	11 FEB 1650	131	17.					
11 FEB 0740	21	0.	*	11 FEB 1045	58	3.	*	11 FEB 1350	95	46.	*	11 FEB 1655	132	16.					
11 FEB 0745	22	0.	*	11 FEB 1050	59	3.	*	11 FEB 1355	96	43.	*	11 FEB 1700	133	16.					
11 FEB 0750	23	0.	*	11 FEB 1055	60	4.	*	11 FEB 1400	97	41.	*	11 FEB 1705	134	16.					
11 FEB 0755	24	0.	*	11 FEB 1100	61	5.	*	11 FEB 1405	98	39.	*	11 FEB 1710	135	15.					
11 FEB 0800	25	0.	*	11 FEB 1105	62	6.	*	11 FEB 1410	99	37.	*	11 FEB 1715	136	15.					
11 FEB 0805	26	0.	*	11 FEB 1110	63	7.	*	11 FEB 1415	100	35.	*	11 FEB 1720	137	15.					
11 FEB 0810	27	0.	*	11 FEB 1115	64	9.	*	11 FEB 1420	101	33.	*	11 FEB 1725	138	15.					
11 FEB 0815	28	0.	*	11 FEB 1120	65	10.	*	11 FEB 1425	102	31.	*	11 FEB 1730	139	15.					
11 FEB 0820	29	0.	*	11 FEB 1125	66	12.	*	11 FEB 1430	103	29.	*	11 FEB 1735	140	15.					
11 FEB 0825	30	0.	*	11 FEB 1130	67	14.	*	11 FEB 1435	104	28.	*	11 FEB 1740	141	15.					
11 FEB 0830	31	0.	*	11 FEB 1135	68	18.	*	11 FEB 1440	105	27.	*	11 FEB 1745	142	14.					
11 FEB 0835	32	0.	*	11 FEB 1140	69	28.	*	11 FEB 1445	106	26.	*	11 FEB 1750	143	14.					
11 FEB 0840	33	0.	*	11 FEB 1145	70	47.	*	11 FEB 1450	107	25.	*	11 FEB 1755	144	13.					
11 FEB 0845	34	0.	*	11 FEB 1150	71	77.	*	11 FEB 1455	108	24.	*	11 FEB 1800	145	12.					
11 FEB 0850	35	0.	*	11 FEB 1155	72	117.	*	11 FEB 1500	109	24.	*								
11 FEB 0855	36	0.	*	11 FEB 1200	73	163.	*	11 FEB 1505	110	23.	*								
11 FEB 0900	37	0.	*	11 FEB 1205	74	207.	*	11 FEB 1510	111	23.	*								

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	12.00-HR
+ (CFS)	(HR)	(CFS)				
+ 264.	6.33		63.	33.	33.	33.
		(INCHES)	4.061	4.202	4.202	4.202
		(AC-FT)	31.	33.	33.	33.

CUMULATIVE AREA = .15 SQ MI

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          *             *
 30 KK    *    BASIN1   *
          *             *
          ***************

  9 IN        TIME DATA FOR INPUT TIME SERIES
                  JXMIN        30  TIME INTERVAL IN MINUTES
                 JXDATE   11FEB93  STARTING DATE
                 JXTIME       600  STARTING TIME

              SUBBASIN RUNOFF DATA

 31 BA        SUBBASIN CHARACTERISTICS
                  TAREA       .00  SUBBASIN AREA

              PRECIPITATION DATA

 32 PB            STORM      7.80  BASIN TOTAL PRECIPITATION

 33 PI        INCREMENTAL PRECIPITATION PATTERN
                .00  .00  .00  .00  .00  .00  .00  .00  .00  .00
                .00  .00  .00  .00  .00  .00  .00  .00  .00  .00
                .00  .00  .00  .00  .00  .00  .00  .00  .00  .00
                .00  .00  .00  .00  .00  .00  .00  .00  .00  .00
                .00  .00  .00  .00  .00  .00  .00  .00  .00  .00
                .00  .00  .00  .00  .01  .01  .01  .01  .01  .01
                .01  .01  .01  .01  .01  .01  .06  .06  .06  .06
                .06  .06  .01  .01  .01  .01  .01  .01  .01  .01
                .01  .01  .01  .01  .00  .00  .00  .00  .00  .00
                .00  .00  .00  .00  .00  .00  .00  .00  .00  .00
                .00  .00  .00  .00  .00  .00  .00  .00  .00  .00
                .00  .00  .00  .00  .00  .00  .00  .00  .00  .00
                .00  .00  .00  .00  .00  .00  .00  .00  .00  .00
                .00  .00  .00  .00

 37 LS        SCS LOSS RATE
                  STRTL       .53  INITIAL ABSTRACTION
                 CRVNBR     79.00  CURVE NUMBER
                  RTIMP       .00  PERCENT IMPERVIOUS AREA
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38 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .25 LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
17 END-OF-PERIOD ORDINATES

1.	5.	8.	8.	6.	4.	2.	1.	1.	1.
0.	0.	0.	0.	0.	0.	0.			

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HYDROGRAPH AT STATION BASIN1

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
11 FEB 0600	1	.00	.00	.00	0.
11 FEB 0605	2	.02	.02	.00	0.
11 FEB 0610	3	.02	.02	.00	0.
11 FEB 0615	4	.02	.02	.00	0.
11 FEB 0620	5	.02	.02	.00	0.
11 FEB 0625	6	.02	.02	.00	0.
11 FEB 0630	7	.02	.02	.00	0.
11 FEB 0635	8	.02	.02	.00	0.
11 FEB 0640	9	.02	.02	.00	0.
11 FEB 0645	10	.02	.02	.00	0.
11 FEB 0650	11	.02	.02	.00	0.
11 FEB 0655	12	.02	.02	.00	0.
11 FEB 0700	13	.02	.02	.00	0.
11 FEB 0705	14	.02	.02	.00	0.
11 FEB 0710	15	.02	.02	.00	0.
11 FEB 0715	16	.02	.02	.00	0.
11 FEB 0720	17	.02	.02	.00	0.
11 FEB 0725	18	.02	.02	.00	0.
11 FEB 0730	19	.02	.02	.00	0.
11 FEB 0735	20	.02	.02	.00	0.
11 FEB 0740	21	.02	.02	.00	0.
11 FEB 0745	22	.02	.02	.00	0.
11 FEB 0750	23	.02	.02	.00	0.
11 FEB 0755	24	.02	.02	.00	0.
11 FEB 0800	25	.02	.02	.00	0.
11 FEB 0805	26	.02	.02	.00	0.
11 FEB 0810	27	.02	.02	.00	0.
11 FEB 0815	28	.02	.02	.00	0.
11 FEB 0820	29	.02	.02	.00	0.
11 FEB 0825	30	.02	.02	.00	0.
11 FEB 0830	31	.02	.02	.00	0.
11 FEB 0835	32	.02	.02	.00	0.
11 FEB 0840	33	.02	.02	.00	0.
11 FEB 0845	34	.02	.02	.00	0.
11 FEB 0850	35	.02	.02	.00	0.
11 FEB 0855	36	.02	.02	.00	0.
11 FEB 0900	37	.02	.02	.00	0.
11 FEB 0905	38	.02	.02	.00	0.
11 FEB 0910	39	.02	.02	.00	0.
11 FEB 0915	40	.02	.02	.00	0.
11 FEB 0920	41	.02	.02	.00	0.
11 FEB 0925	42	.02	.02	.00	0.
11 FEB 0930	43	.02	.02	.00	0.
11 FEB 0935	44	.03	.02	.00	0.
11 FEB 0940	45	.03	.02	.01	0.
11 FEB 0945	46	.03	.02	.01	0.
11 FEB 0950	47	.03	.02	.01	0.
11 FEB 0955	48	.03	.02	.01	0.
11 FEB 1000	49	.03	.02	.01	0.
11 FEB 1005	50	.04	.03	.01	0.
11 FEB 1010	51	.04	.03	.01	0.
11 FEB 1015	52	.04	.03	.01	0.
11 FEB 1020	53	.04	.02	.01	0.
11 FEB 1025	54	.04	.02	.01	0.
11 FEB 1030	55	.04	.02	.01	0.
11 FEB 1035	56	.05	.03	.02	0.
11 FEB 1040	57	.05	.03	.02	0.
11 FEB 1045	58	.05	.03	.02	0.
11 FEB 1050	59	.05	.03	.02	1.
11 FEB 1205	74	.11	.01	.10	15.
11 FEB 1210	75	.11	.01	.10	14.
11 FEB 1215	76	.11	.01	.10	12.
11 FEB 1220	77	.11	.01	.10	9.
11 FEB 1225	78	.11	.01	.10	7.
11 FEB 1230	79	.11	.01	.10	6.
11 FEB 1235	80	.06	.01	.05	5.
11 FEB 1240	81	.06	.01	.05	4.
11 FEB 1245	82	.06	.01	.05	4.
11 FEB 1250	83	.06	.01	.05	3.
11 FEB 1255	84	.06	.01	.05	3.
11 FEB 1300	85	.06	.01	.05	2.
11 FEB 1305	86	.04	.00	.04	2.
11 FEB 1310	87	.04	.00	.04	2.
11 FEB 1315	88	.04	.00	.04	2.
11 FEB 1320	89	.04	.00	.04	2.
11 FEB 1325	90	.04	.00	.04	2.
11 FEB 1330	91	.04	.00	.04	1.
11 FEB 1335	92	.03	.00	.03	1.
11 FEB 1340	93	.03	.00	.03	1.
11 FEB 1345	94	.03	.00	.03	1.
11 FEB 1350	95	.03	.00	.03	1.
11 FEB 1355	96	.03	.00	.03	1.
11 FEB 1400	97	.03	.00	.03	1.
11 FEB 1405	98	.02	.00	.02	1.
11 FEB 1410	99	.02	.00	.02	1.
11 FEB 1415	100	.02	.00	.02	1.
11 FEB 1420	101	.02	.00	.02	1.
11 FEB 1425	102	.02	.00	.02	1.
11 FEB 1430	103	.02	.00	.02	1.
11 FEB 1435	104	.02	.00	.02	1.
11 FEB 1440	105	.02	.00	.02	1.
11 FEB 1445	106	.02	.00	.02	1.
11 FEB 1450	107	.02	.00	.02	1.
11 FEB 1455	108	.02	.00	.02	1.
11 FEB 1500	109	.02	.00	.02	1.
11 FEB 1505	110	.02	.00	.02	1.
11 FEB 1510	111	.02	.00	.02	1.
11 FEB 1515	112	.02	.00	.02	1.
11 FEB 1520	113	.02	.00	.02	1.
11 FEB 1525	114	.02	.00	.02	1.
11 FEB 1530	115	.02	.00	.02	1.
11 FEB 1535	116	.02	.00	.02	1.
11 FEB 1540	117	.02	.00	.02	1.
11 FEB 1545	118	.02	.00	.02	1.
11 FEB 1550	119	.02	.00	.02	1.
11 FEB 1555	120	.02	.00	.02	1.
11 FEB 1600	121	.02	.00	.02	1.
11 FEB 1605	122	.02	.00	.01	1.
11 FEB 1610	123	.02	.00	.01	1.
11 FEB 1615	124	.02	.00	.01	1.
11 FEB 1620	125	.02	.00	.01	1.
11 FEB 1625	126	.02	.00	.01	1.
11 FEB 1630	127	.02	.00	.01	1.
11 FEB 1635	128	.02	.00	.01	1.
11 FEB 1640	129	.02	.00	.01	1.
11 FEB 1645	130	.02	.00	.01	1.
11 FEB 1650	131	.02	.00	.01	1.
11 FEB 1655	132	.02	.00	.01	1.

11 FEB 1055	60	.05	.03	.02	1.	*	11 FEB 1700	133	.02	.00	.01	1.
11 FEB 1100	61	.05	.03	.02	1.	*	11 FEB 1705	134	.02	.00	.01	1.
11 FEB 1105	62	.07	.04	.03	1.	*	11 FEB 1710	135	.02	.00	.01	1.
11 FEB 1110	63	.07	.04	.04	1.	*	11 FEB 1715	136	.02	.00	.01	1.
11 FEB 1115	64	.07	.04	.04	1.	*	11 FEB 1720	137	.02	.00	.01	1.
11 FEB 1120	65	.07	.04	.04	1.	*	11 FEB 1725	138	.02	.00	.01	1.
11 FEB 1125	66	.07	.03	.04	1.	*	11 FEB 1730	139	.02	.00	.01	1.
11 FEB 1130	67	.07	.03	.04	1.	*	11 FEB 1735	140	.01	.00	.01	1.
11 FEB 1135	68	.59	.23	.37	2.	*	11 FEB 1740	141	.01	.00	.01	0.
11 FEB 1140	69	.59	.17	.42	3.	*	11 FEB 1745	142	.01	.00	.01	0.
11 FEB 1145	70	.59	.14	.45	6.	*	11 FEB 1750	143	.01	.00	.01	0.
11 FEB 1150	71	.59	.11	.48	9.	*	11 FEB 1755	144	.01	.00	.01	0.
11 FEB 1155	72	.59	.09	.50	12.	*	11 FEB 1800	145	.01	.00	.01	0.
11 FEB 1200	73	.59	.08	.51	14.	*						
						*						

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TOTAL RAINFALL = 7.80, TOTAL LOSS = 2.48, TOTAL EXCESS = 5.32

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	12.00-HR
+	(CFS)	(HR)	(CFS)				
+	15.	6.08		3.	1.	1.	1.
			(INCHES)	4.972	5.285	5.285	5.285
			(AC-FT)	1.	1.	1.	1.

CUMULATIVE AREA = .00 SQ MI

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          *             *
39 KK     *    BASIN2   *
          *             *
          ***************
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9 IN — TIME DATA FOR INPUT TIME SERIES

JXMIN	30	TIME INTERVAL IN MINUTES
JXDATE	11FEB93	STARTING DATE
JXTIME	600	STARTING TIME

SUBBASIN RUNOFF DATA

40 BA — SUBBASIN CHARACTERISTICS

TAREA	.06	SUBBASIN AREA

PRECIPITATION DATA

41 PB — STORM 7.80 BASIN TOTAL PRECIPITATION

42 PI — INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.06	.06	.06	.06
.06	.06	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00						

46 LS — SCS LOSS RATE

STRTL	.47	INITIAL ABSTRACTION
CRVNBR	81.00	CURVE NUMBER
RTIMP	.00	PERCENT IMPERVIOUS AREA

47 UD — SCS DIMENSIONLESS UNITGRAPH

TLAG	.25	LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
17 END-OF-PERIOD ORDINATES

17. 58. 92. 92. 72. 43. 27. 17. 11. 7.
4. 3. 2. 1. 1. 0. 0.

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HYDROGRAPH AT STATION BASIN2

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
11 FEB 0600	1	.00	.00	.00	0.
11 FEB 0605	2	.02	.02	.00	0.
11 FEB 0610	3	.02	.02	.00	0.
11 FEB 0615	4	.02	.02	.00	0.
11 FEB 0620	5	.02	.02	.00	0.
11 FEB 0625	6	.02	.02	.00	0.
11 FEB 0630	7	.02	.02	.00	0.
11 FEB 0635	8	.02	.02	.00	0.
11 FEB 0640	9	.02	.02	.00	0.
11 FEB 0645	10	.02	.02	.00	0.
11 FEB 0650	11	.02	.02	.00	0.
11 FEB 0655	12	.02	.02	.00	0.
11 FEB 0700	13	.02	.02	.00	0.
11 FEB 0705	14	.02	.02	.00	0.
11 FEB 0710	15	.02	.02	.00	0.
11 FEB 0715	16	.02	.02	.00	0.
11 FEB 0720	17	.02	.02	.00	0.
11 FEB 0725	18	.02	.02	.00	0.
11 FEB 0730	19	.02	.02	.00	0.
11 FEB 0735	20	.02	.02	.00	0.
11 FEB 0740	21	.02	.02	.00	0.
11 FEB 0745	22	.02	.02	.00	0.
11 FEB 0750	23	.02	.02	.00	0.
11 FEB 0755	24	.02	.02	.00	0.
11 FEB 0800	25	.02	.02	.00	0.
11 FEB 0805	26	.02	.02	.00	0.
11 FEB 0810	27	.02	.02	.00	0.
11 FEB 0815	28	.02	.02	.00	0.
11 FEB 0820	29	.02	.02	.00	0.
11 FEB 0825	30	.02	.02	.00	0.
11 FEB 0830	31	.02	.02	.00	0.
11 FEB 0835	32	.02	.02	.00	0.
11 FEB 0840	33	.02	.02	.00	0.
11 FEB 0845	34	.02	.02	.00	0.
11 FEB 0850	35	.02	.02	.00	0.
11 FEB 0855	36	.02	.02	.00	0.
11 FEB 0900	37	.02	.02	.00	1.
11 FEB 0905	38	.02	.02	.00	1.
11 FEB 0910	39	.02	.02	.00	1.
11 FEB 0915	40	.02	.02	.00	1.
11 FEB 0920	41	.02	.02	.00	1.
11 FEB 0925	42	.02	.02	.00	2.
11 FEB 0930	43	.02	.02	.01	2.
11 FEB 0935	44	.03	.02	.01	2.
11 FEB 0940	45	.03	.02	.01	2.
11 FEB 0945	46	.03	.02	.01	2.
11 FEB 0950	47	.03	.02	.01	3.
11 FEB 0955	48	.03	.02	.01	3.
11 FEB 1000	49	.03	.02	.01	3.
11 FEB 1005	50	.04	.02	.01	3.
11 FEB 1010	51	.04	.02	.01	4.
11 FEB 1015	52	.04	.02	.01	4.
11 FEB 1020	53	.04	.02	.01	5.
11 FEB 1025	54	.04	.02	.01	5.
11 FEB 1030	55	.04	.02	.01	5.
11 FEB 1035	56	.05	.03	.02	6.
11 FEB 1040	57	.05	.03	.02	6.
11 FEB 1045	58	.05	.03	.02	7.
11 FEB 1050	59	.05	.03	.02	8.
11 FEB 1055	60	.05	.03	.02	9.
11 FEB 1100	61	.05	.02	.02	9.
11 FEB 1105	62	.07	.04	.04	10.
11 FEB 1110	63	.07	.03	.04	11.
11 FEB 1205	74	.11	.01	.10	191.
11 FEB 1210	75	.11	.01	.10	179.
11 FEB 1215	76	.11	.01	.10	149.
11 FEB 1220	77	.11	.01	.10	115.
11 FEB 1225	78	.11	.01	.10	89.
11 FEB 1230	79	.11	.01	.10	73.
11 FEB 1235	80	.06	.00	.05	62.
11 FEB 1240	81	.06	.00	.05	53.
11 FEB 1245	82	.06	.00	.05	44.
11 FEB 1250	83	.06	.00	.05	37.
11 FEB 1255	84	.06	.00	.05	32.
11 FEB 1300	85	.06	.00	.05	29.
11 FEB 1305	86	.04	.00	.04	27.
11 FEB 1310	87	.04	.00	.04	25.
11 FEB 1315	88	.04	.00	.04	22.
11 FEB 1320	89	.04	.00	.04	21.
11 FEB 1325	90	.04	.00	.04	19.
11 FEB 1330	91	.04	.00	.04	19.
11 FEB 1335	92	.03	.00	.03	18.
11 FEB 1340	93	.03	.00	.03	17.
11 FEB 1345	94	.03	.00	.03	16.
11 FEB 1350	95	.03	.00	.03	15.
11 FEB 1355	96	.03	.00	.03	15.
11 FEB 1400	97	.03	.00	.03	14.
11 FEB 1405	98	.02	.00	.02	14.
11 FEB 1410	99	.02	.00	.02	13.
11 FEB 1415	100	.02	.00	.02	12.
11 FEB 1420	101	.02	.00	.02	11.
11 FEB 1425	102	.02	.00	.02	11.
11 FEB 1430	103	.02	.00	.02	10.
11 FEB 1435	104	.02	.00	.02	10.
11 FEB 1440	105	.02	.00	.02	10.
11 FEB 1445	106	.02	.00	.02	10.
11 FEB 1450	107	.02	.00	.02	10.
11 FEB 1455	108	.02	.00	.02	10.
11 FEB 1500	109	.02	.00	.02	10.
11 FEB 1505	110	.02	.00	.02	10.
11 FEB 1510	111	.02	.00	.02	10.
11 FEB 1515	112	.02	.00	.02	10.
11 FEB 1520	113	.02	.00	.02	10.
11 FEB 1525	114	.02	.00	.02	10.
11 FEB 1530	115	.02	.00	.02	10.
11 FEB 1535	116	.02	.00	.02	10.
11 FEB 1540	117	.02	.00	.02	10.
11 FEB 1545	118	.02	.00	.02	10.
11 FEB 1550	119	.02	.00	.02	10.
11 FEB 1555	120	.02	.00	.02	10.
11 FEB 1600	121	.02	.00	.02	10.
11 FEB 1605	122	.02	.00	.01	10.
11 FEB 1610	123	.02	.00	.01	9.
11 FEB 1615	124	.02	.00	.01	9.
11 FEB 1620	125	.02	.00	.01	8.
11 FEB 1625	126	.02	.00	.01	7.
11 FEB 1630	127	.02	.00	.01	7.
11 FEB 1635	128	.02	.00	.01	7.
11 FEB 1640	129	.02	.00	.01	7.
11 FEB 1645	130	.02	.00	.01	7.
11 FEB 1650	131	.02	.00	.01	7.
11 FEB 1655	132	.02	.00	.01	7.
11 FEB 1700	133	.02	.00	.01	7.
11 FEB 1705	134	.02	.00	.01	7.
11 FEB 1710	135	.02	.00	.01	7.
11 FEB 1715	136	.02	.00	.01	7.

11 FEB 1115	64	.07	.03	.04	13.	*	11 FEB 1720	137	.02	.00	.01	7.
11 FEB 1120	65	.07	.03	.04	15.	*	11 FEB 1725	138	.02	.00	.01	7.
11 FEB 1125	66	.07	.03	.04	16.	*	11 FEB 1730	139	.02	.00	.01	7.
11 FEB 1130	67	.07	.03	.05	17.	*	11 FEB 1735	140	.01	.00	.01	6.
11 FEB 1135	68	.59	.20	.39	24.	*	11 FEB 1740	141	.01	.00	.01	6.
11 FEB 1140	69	.59	.15	.44	46.	*	11 FEB 1745	142	.01	.00	.01	6.
11 FEB 1145	70	.59	.12	.47	82.	*	11 FEB 1750	143	.01	.00	.01	5.
11 FEB 1150	71	.59	.10	.50	121.	*	11 FEB 1755	144	.01	.00	.01	5.
11 FEB 1155	72	.59	.08	.51	155.	*	11 FEB 1800	145	.01	.00	.01	4.
11 FEB 1200	73	.59	.07	.52	180.	*						

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TOTAL RAINFALL = 7.80, TOTAL LOSS = 2.25, TOTAL EXCESS = 5.55

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	12.00-HR
+	(CFS)	(HR)	(CFS)			
+	191.	6.08	32.	17.	17.	17.
			(INCHES) 5.165	5.516	5.516	5.516
			(AC-FT) 16.	17.	17.	17.

CUMULATIVE AREA = .06 SQ MI

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48 KK     *     INTO2   *
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49 HC HYDROGRAPH COMBINATION
ICOMP 3 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION INTO2
SUM OF 3 HYDROGRAPHS

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DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
11 FEB 0600	1	0.	11 FEB 0905	38	1.	11 FEB 1210	75	436.	11 FEB 1515	112	33.
11 FEB 0605	2	0.	11 FEB 0910	39	1.	11 FEB 1215	76	423.	11 FEB 1520	113	33.
11 FEB 0610	3	0.	11 FEB 0915	40	1.	11 FEB 1220	77	388.	11 FEB 1525	114	33.
11 FEB 0615	4	0.	11 FEB 0920	41	1.	11 FEB 1225	78	347.	11 FEB 1530	115	33.
11 FEB 0620	5	0.	11 FEB 0925	42	2.	11 FEB 1230	79	310.	11 FEB 1535	116	33.
11 FEB 0625	6	0.	11 FEB 0930	43	2.	11 FEB 1235	80	276.	11 FEB 1540	117	33.
11 FEB 0630	7	0.	11 FEB 0935	44	2.	11 FEB 1240	81	243.	11 FEB 1545	118	33.
11 FEB 0635	8	0.	11 FEB 0940	45	2.	11 FEB 1245	82	214.	11 FEB 1550	119	33.
11 FEB 0640	9	0.	11 FEB 0945	46	3.	11 FEB 1250	83	187.	11 FEB 1555	120	33.
11 FEB 0645	10	0.	11 FEB 0950	47	3.	11 FEB 1255	84	164.	11 FEB 1600	121	33.
11 FEB 0650	11	0.	11 FEB 0955	48	3.	11 FEB 1300	85	145.	11 FEB 1605	122	32.
11 FEB 0655	12	0.	11 FEB 1000	49	3.	11 FEB 1305	86	130.	11 FEB 1610	123	32.
11 FEB 0700	13	0.	11 FEB 1005	50	4.	11 FEB 1310	87	117.	11 FEB 1615	124	31.
11 FEB 0705	14	0.	11 FEB 1010	51	4.	11 FEB 1315	88	106.	11 FEB 1620	125	29.
11 FEB 0710	15	0.	11 FEB 1015	52	5.	11 FEB 1320	89	96.	11 FEB 1625	126	28.
11 FEB 0715	16	0.	11 FEB 1020	53	5.	11 FEB 1325	90	88.	11 FEB 1630	127	27.
11 FEB 0720	17	0.	11 FEB 1025	54	6.	11 FEB 1330	91	82.	11 FEB 1635	128	26.
11 FEB 0725	18	0.	11 FEB 1030	55	7.	11 FEB 1335	92	76.	11 FEB 1640	129	25.
11 FEB 0730	19	0.	11 FEB 1035	56	8.	11 FEB 1340	93	71.	11 FEB 1645	130	24.
11 FEB 0735	20	0.	11 FEB 1040	57	9.	11 FEB 1345	94	67.	11 FEB 1650	131	24.
11 FEB 0740	21	0.	11 FEB 1045	58	10.	11 FEB 1350	95	63.	11 FEB 1655	132	23.
11 FEB 0745	22	0.	11 FEB 1050	59	12.	11 FEB 1355	96	59.	11 FEB 1700	133	23.
11 FEB 0750	23	0.	11 FEB 1055	60	13.	11 FEB 1400	97	56.	11 FEB 1705	134	23.
11 FEB 0755	24	0.	11 FEB 1100	61	15.	11 FEB 1405	98	53.	11 FEB 1710	135	23.
11 FEB 0800	25	0.	11 FEB 1105	62	17.	11 FEB 1410	99	51.	11 FEB 1715	136	22.
11 FEB 0805	26	0.	11 FEB 1110	63	19.	11 FEB 1415	100	48.	11 FEB 1720	137	22.
11 FEB 0810	27	0.	11 FEB 1115	64	22.	11 FEB 1420	101	45.	11 FEB 1725	138	22.
11 FEB 0815	28	0.	11 FEB 1120	65	26.	11 FEB 1425	102	43.	11 FEB 1730	139	22.
11 FEB 0820	29	0.	11 FEB 1125	66	29.	11 FEB 1430	103	41.	11 FEB 1735	140	22.

11 FEB	0825	30	0.	*	11 FEB	1130	67	33.	*	11 FEB	1435	104	39.	*	11 FEB	1740	141	21.
11 FEB	0830	31	0.	*	11 FEB	1135	68	44.	*	11 FEB	1440	105	37.	*	11 FEB	1745	142	20.
11 FEB	0835	32	0.	*	11 FEB	1140	69	77.	*	11 FEB	1445	106	36.	*	11 FEB	1750	143	19.
11 FEB	0840	33	0.	*	11 FEB	1145	70	135.	*	11 FEB	1450	107	35.	*	11 FEB	1755	144	18.
11 FEB	0845	34	0.	*	11 FEB	1150	71	207.	*	11 FEB	1455	108	35.	*	11 FEB	1800	145	17.
11 FEB	0850	35	0.	*	11 FEB	1155	72	284.	*	11 FEB	1500	109	34.	*				
11 FEB	0855	36	0.	*	11 FEB	1200	73	357.	*	11 FEB	1505	110	34.	*				
11 FEB	0900	37	1.	*	11 FEB	1205	74	413.	*	11 FEB	1510	111	33.	*				
				*					*					*				

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	12.00-HR
+ (CFS)	(HR)	(CFS)				
+ 436.	6.17		98.	51.	51.	51.
		(INCHES)	4.370	4.592	4.592	4.592
		(AC-FT)	48.	51.	51.	51.

CUMULATIVE AREA = .21 SQ MI

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50 KK     *   PON1$2    *
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HYDROGRAPH ROUTING DATA

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51 RS     STORAGE ROUTING
               NSTPS        1  NUMBER OF SUBREACHES
                ITYP     ELEV  TYPE OF INITIAL CONDITION
              RSVRIC  1346.50  INITIAL CONDITION
                   X      .00 WORKING R AND D COEFFICIENT

52 SA          AREA      2.8      3.9

53 SE       ELEVATION 1346.50  1351.50

54 SS       SPILLWAY
              CREL     1346.50  SPILLWAY CREST ELEVATION
             SPWID       30.00  SPILLWAY WIDTH
              COQW        1.80  WEIR COEFFICIENT
              EXPW        1.50  EXPONENT OF HEAD
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COMPUTED STORAGE-ELEVATION DATA

STORAGE	.00	16.67								
ELEVATION	1346.50	1351.50								

COMPUTED OUTFLOW-ELEVATION DATA

OUTFLOW	.00	.00	.10	.83	2.80	6.63	12.94	22.36	35.51	53.00
ELEVATION	1346.50	1346.50	1346.52	1346.56	1346.64	1346.75	1346.89	1347.06	1347.26	1347.49
OUTFLOW	75.47	103.52	137.79	178.88	227.44	284.06	349.38	424.02	508.60	603.74
ELEVATION	1347.75	1348.04	1348.37	1348.72	1349.11	1349.52	1349.97	1350.45	1350.96	1351.50

COMPUTED STORAGE-OUTFLOW-ELEVATION DATA

STORAGE	.00	.04	.17	.39	.70	1.10	1.59	2.18	2.87	3.66
OUTFLOW	.00	.10	.83	2.80	6.63	12.94	22.36	35.51	53.00	75.47
ELEVATION	1346.50	1346.52	1346.56	1346.64	1346.75	1346.89	1347.06	1347.26	1347.49	1347.75
STORAGE	4.57	5.59	6.73	8.01	9.43	10.99	12.71	14.60	16.67	
OUTFLOW	103.52	137.79	178.88	227.44	284.06	349.38	424.02	508.60	603.74	
ELEVATION	1348.04	1348.37	1348.72	1349.11	1349.52	1349.97	1350.45	1350.96	1351.50	

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HYDROGRAPH AT STATION PON1$2

DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA	MON	HRMN	ORD	OUTFLOW	STORAGE	STAGE
11	FEB	0600	1	0.	.0	1346.5	11	FEB	1005	50	1.	.2	1346.6	11	FEB	1410	99	72.	3.5	1347.7
11	FEB	0605	2	0.	.0	1346.5	11	FEB	1010	51	1.	.2	1346.6	11	FEB	1415	100	68.	3.4	1347.7
11	FEB	0610	3	0.	.0	1346.5	11	FEB	1015	52	1.	.2	1346.6	11	FEB	1420	101	64.	3.3	1347.6
11	FEB	0615	4	0.	.0	1346.5	11	FEB	1020	53	1.	.2	1346.6	11	FEB	1425	102	61.	3.1	1347.6
11	FEB	0620	5	0.	.0	1346.5	11	FEB	1025	54	2.	.3	1346.6	11	FEB	1430	103	57.	3.0	1347.5
11	FEB	0625	6	0.	.0	1346.5	11	FEB	1030	55	2.	.3	1346.6	11	FEB	1435	104	54.	2.9	1347.5
11	FEB	0630	7	0.	.0	1346.5	11	FEB	1035	56	2.	.3	1346.6	11	FEB	1440	105	51.	2.8	1347.5
11	FEB	0635	8	0.	.0	1346.5	11	FEB	1040	57	3.	.4	1346.6	11	FEB	1445	106	49.	2.7	1347.4
11	FEB	0640	9	0.	.0	1346.5	11	FEB	1045	58	3.	.4	1346.6	11	FEB	1450	107	47.	2.6	1347.4
11	FEB	0645	10	0.	.0	1346.5	11	FEB	1050	59	4.	.5	1346.7	11	FEB	1455	108	45.	2.6	1347.4
11	FEB	0650	11	0.	.0	1346.5	11	FEB	1055	60	4.	.5	1346.7	11	FEB	1500	109	43.	2.5	1347.4
11	FEB	0655	12	0.	.0	1346.5	11	FEB	1100	61	5.	.6	1346.7	11	FEB	1505	110	42.	2.4	1347.3
11	FEB	0700	13	0.	.0	1346.5	11	FEB	1105	62	6.	.7	1346.7	11	FEB	1510	111	40.	2.4	1347.3
11	FEB	0705	14	0.	.0	1346.5	11	FEB	1110	63	7.	.7	1346.8	11	FEB	1515	112	39.	2.3	1347.3
11	FEB	0710	15	0.	.0	1346.5	11	FEB	1115	64	9.	.8	1346.8	11	FEB	1520	113	38.	2.3	1347.3
11	FEB	0715	16	0.	.0	1346.5	11	FEB	1120	65	10.	.9	1346.8	11	FEB	1525	114	37.	2.3	1347.3
11	FEB	0720	17	0.	.0	1346.5	11	FEB	1125	66	12.	1.0	1346.9	11	FEB	1530	115	37.	2.2	1347.3
11	FEB	0725	18	0.	.0	1346.5	11	FEB	1130	67	14.	1.2	1346.9	11	FEB	1535	116	36.	2.2	1347.3
11	FEB	0730	19	0.	.0	1346.5	11	FEB	1135	68	17.	1.3	1347.0	11	FEB	1540	117	36.	2.2	1347.3
11	FEB	0735	20	0.	.0	1346.5	11	FEB	1140	69	23.	1.6	1347.1	11	FEB	1545	118	35.	2.2	1347.3
11	FEB	0740	21	0.	.0	1346.5	11	FEB	1145	70	35.	2.1	1347.2	11	FEB	1550	119	35.	2.1	1347.2
11	FEB	0745	22	0.	.0	1346.5	11	FEB	1150	71	57.	3.0	1347.5	11	FEB	1555	120	34.	2.1	1347.2
11	FEB	0750	23	0.	.0	1346.5	11	FEB	1155	72	92.	4.2	1347.9	11	FEB	1600	121	34.	2.1	1347.2
11	FEB	0755	24	0.	.0	1346.5	11	FEB	1200	73	138.	5.6	1348.4	11	FEB	1605	122	34.	2.1	1347.2
11	FEB	0800	25	0.	.0	1346.5	11	FEB	1205	74	193.	7.1	1348.8	11	FEB	1610	123	34.	2.1	1347.2
11	FEB	0805	26	0.	.0	1346.5	11	FEB	1210	75	248.	8.5	1349.3	11	FEB	1615	124	33.	2.1	1347.2
11	FEB	0810	27	0.	.0	1346.5	11	FEB	1215	76	292.	9.6	1349.6	11	FEB	1620	125	33.	2.1	1347.2
11	FEB	0815	28	0.	.0	1346.5	11	FEB	1220	77	320.	10.3	1349.8	11	FEB	1625	126	32.	2.0	1347.2
11	FEB	0820	29	0.	.0	1346.5	11	FEB	1225	78	332.	10.6	1349.9	11	FEB	1630	127	32.	2.0	1347.2
11	FEB	0825	30	0.	.0	1346.5	11	FEB	1230	79	331.	10.6	1349.8	11	FEB	1635	128	31.	2.0	1347.2
11	FEB	0830	31	0.	.0	1346.5	11	FEB	1235	80	322.	10.3	1349.8	11	FEB	1640	129	30.	1.9	1347.2
11	FEB	0835	32	0.	.0	1346.5	11	FEB	1240	81	306.	10.0	1349.7	11	FEB	1645	130	29.	1.9	1347.2
11	FEB	0840	33	0.	.0	1346.5	11	FEB	1245	82	287.	9.5	1349.5	11	FEB	1650	131	28.	1.9	1347.1
11	FEB	0845	34	0.	.0	1346.5	11	FEB	1250	83	266.	9.0	1349.4	11	FEB	1655	132	28.	1.8	1347.1
11	FEB	0850	35	0.	.0	1346.5	11	FEB	1255	84	244.	8.4	1349.2	11	FEB	1700	133	27.	1.8	1347.1
11	FEB	0855	36	0.	.0	1346.5	11	FEB	1300	85	222.	7.9	1349.1	11	FEB	1705	134	26.	1.8	1347.1
11	FEB	0900	37	0.	.0	1346.5	11	FEB	1305	86	203.	7.4	1348.9	11	FEB	1710	135	26.	1.7	1347.1
11	FEB	0905	38	0.	.0	1346.5	11	FEB	1310	87	184.	6.9	1348.8	11	FEB	1715	136	25.	1.7	1347.1
11	FEB	0910	39	0.	.0	1346.5	11	FEB	1315	88	168.	6.4	1348.6	11	FEB	1720	137	25.	1.7	1347.1
11	FEB	0915	40	0.	.0	1346.5	11	FEB	1320	89	153.	6.0	1348.5	11	FEB	1725	138	25.	1.7	1347.1
11	FEB	0920	41	0.	.0	1346.5	11	FEB	1325	90	140.	5.6	1348.4	11	FEB	1730	139	24.	1.7	1347.1
11	FEB	0925	42	0.	.0	1346.5	11	FEB	1330	91	128.	5.3	1348.3	11	FEB	1735	140	24.	1.7	1347.1
11	FEB	0930	43	0.	.1	1346.5	11	FEB	1335	92	118.	5.0	1348.2	11	FEB	1740	141	24.	1.6	1347.1
11	FEB	0935	44	0.	.1	1346.5	11	FEB	1340	93	109.	4.7	1348.1	11	FEB	1745	142	23.	1.6	1347.1
11	FEB	0940	45	0.	.1	1346.5	11	FEB	1345	94	101.	4.5	1348.0	11	FEB	1750	143	23.	1.6	1347.1
11	FEB	0945	46	0.	.1	1346.5	11	FEB	1350	95	94.	4.3	1347.9	11	FEB	1755	144	22.	1.6	1347.1
11	FEB	0950	47	0.	.1	1346.5	11	FEB	1355	96	88.	4.1	1347.9	11	FEB	1800	145	22.	1.5	1347.0
11	FEB	0955	48	1.	.1	1346.5	11	FEB	1400	97	82.	3.9	1347.8							
11	FEB	1000	49	1.	.1	1346.6	11	FEB	1405	98	77.	3.7	1347.8							

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	12.00-HR
(CFS)	(HR)	(CFS)	97.	50.	50.	50.
332.	6.42	(INCHES)	4.322	4.453	4.453	4.453
		(AC-FT)	48.	49.	49.	49.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	12.00-HR
(AC-FT)	(HR)				
11.	6.42	4.	2.	2.	2.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	12.00-HR
(FEET)	(HR)				
1349.86	6.42	1347.85	1347.22	1347.22	1347.22

CUMULATIVE AREA = .21 SQ MI

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          *            *
55 KK     *    BASIN3  *
          *            *
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 9 IN          TIME DATA FOR INPUT TIME SERIES
                    JXMIN         30  TIME INTERVAL IN MINUTES
                   JXDATE     11FEB93  STARTING DATE
                   JXTIME        600  STARTING TIME

              SUBBASIN RUNOFF DATA

56 BA         SUBBASIN CHARACTERISTICS
                    TAREA         .15  SUBBASIN AREA

              PRECIPITATION DATA

57 PB               STORM        7.80  BASIN TOTAL PRECIPITATION

58 PI           INCREMENTAL PRECIPITATION PATTERN
                  .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                  .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                  .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                  .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                  .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                  .00    .00    .00    .00    .01    .01    .01    .01    .01    .01
                  .01    .01    .01    .01    .01    .01    .06    .06    .06    .06
                  .06    .06    .01    .01    .01    .01    .01    .01    .01    .01
                  .01    .01    .01    .01    .00    .00    .00    .00    .00    .00
                  .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                  .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                  .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                  .00    .00    .00    .00    .00    .00    .00    .00    .00    .00
                  .00    .00    .00    .00
                  .00    .00    .00    .00

 62 LS        SCS LOSS RATE
                    STRTL         .44  INITIAL ABSTRACTION
                   CRVNBR       82.00  CURVE NUMBER
                    RTIMP         .00  PERCENT IMPERVIOUS AREA

 63 UD        SCS DIMENSIONLESS UNITGRAPH
                     TLAG         .25  LAG

                                                    ***

WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

                                        UNIT HYDROGRAPH
                                    17 END-OF-PERIOD ORDINATES
                 44.     151.     240.     240.     187.     112.      70.      45.      28.      18.
                 11.       7.       4.       3.       2.       1.       0.
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HYDROGRAPH AT STATION BASIN3

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DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q	DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
11 FEB 0600	1	.00	.00	.00	0.	11 FEB 1205	74	.11	.01	.10	504.
11 FEB 0605	2	.02	.02	.00	0.	11 FEB 1210	75	.11	.01	.10	473.
11 FEB 0610	3	.02	.02	.00	0.	11 FEB 1215	76	.11	.01	.10	392.
11 FEB 0615	4	.02	.02	.00	0.	11 FEB 1220	77	.11	.01	.10	304.
11 FEB 0620	5	.02	.02	.00	0.	11 FEB 1225	78	.11	.01	.10	233.
11 FEB 0625	6	.02	.02	.00	0.	11 FEB 1230	79	.11	.01	.10	191.
11 FEB 0630	7	.02	.02	.00	0.	11 FEB 1235	80	.06	.00	.05	163.
11 FEB 0635	8	.02	.02	.00	0.	11 FEB 1240	81	.06	.00	.05	138.
11 FEB 0640	9	.02	.02	.00	0.	11 FEB 1245	82	.06	.00	.05	116.
11 FEB 0645	10	.02	.02	.00	0.	11 FEB 1250	83	.06	.00	.05	97.
11 FEB 0650	11	.02	.02	.00	0.	11 FEB 1255	84	.06	.00	.05	84.
11 FEB 0655	12	.02	.02	.00	0.	11 FEB 1300	85	.06	.00	.05	75.
11 FEB 0700	13	.02	.02	.00	0.	11 FEB 1305	86	.04	.00	.04	70.
11 FEB 0705	14	.02	.02	.00	0.	11 FEB 1310	87	.04	.00	.04	64.
11 FEB 0710	15	.02	.02	.00	0.	11 FEB 1315	88	.04	.00	.04	59.

11 FEB 0715	16	.02	.02	.00	0.	*	11 FEB 1320	89	.04	.00	.04	54.
11 FEB 0720	17	.02	.02	.00	0.	*	11 FEB 1325	90	.04	.00	.04	51.
11 FEB 0725	18	.02	.02	.00	0.	*	11 FEB 1330	91	.04	.00	.04	49.
11 FEB 0730	19	.02	.02	.00	0.	*	11 FEB 1335	92	.03	.00	.03	47.
11 FEB 0735	20	.02	.02	.00	0.	*	11 FEB 1340	93	.03	.00	.03	45.
11 FEB 0740	21	.02	.02	.00	0.	*	11 FEB 1345	94	.03	.00	.03	42.
11 FEB 0745	22	.02	.02	.00	0.	*	11 FEB 1350	95	.03	.00	.03	40.
11 FEB 0750	23	.02	.02	.00	0.	*	11 FEB 1355	96	.03	.00	.03	38.
11 FEB 0755	24	.02	.02	.00	0.	*	11 FEB 1400	97	.03	.00	.03	37.
11 FEB 0800	25	.02	.02	.00	0.	*	11 FEB 1405	98	.02	.00	.02	36.
11 FEB 0805	26	.02	.02	.00	0.	*	11 FEB 1410	99	.02	.00	.02	34.
11 FEB 0810	27	.02	.02	.00	0.	*	11 FEB 1415	100	.02	.00	.02	32.
11 FEB 0815	28	.02	.02	.00	0.	*	11 FEB 1420	101	.02	.00	.02	30.
11 FEB 0820	29	.02	.02	.00	0.	*	11 FEB 1425	102	.02	.00	.02	28.
11 FEB 0825	30	.02	.02	.00	0.	*	11 FEB 1430	103	.02	.00	.02	27.
11 FEB 0830	31	.02	.02	.00	0.	*	11 FEB 1435	104	.02	.00	.02	26.
11 FEB 0835	32	.02	.02	.00	0.	*	11 FEB 1440	105	.02	.00	.02	26.
11 FEB 0840	33	.02	.02	.00	1.	*	11 FEB 1445	106	.02	.00	.02	26.
11 FEB 0845	34	.02	.02	.00	1.	*	11 FEB 1450	107	.02	.00	.02	26.
11 FEB 0850	35	.02	.02	.00	1.	*	11 FEB 1455	108	.02	.00	.02	26.
11 FEB 0855	36	.02	.02	.00	2.	*	11 FEB 1500	109	.02	.00	.02	26.
11 FEB 0900	37	.02	.02	.00	2.	*	11 FEB 1505	110	.02	.00	.02	25.
11 FEB 0905	38	.02	.02	.00	3.	*	11 FEB 1510	111	.02	.00	.02	25.
11 FEB 0910	39	.02	.02	.00	3.	*	11 FEB 1515	112	.02	.00	.02	25.
11 FEB 0915	40	.02	.02	.00	4.	*	11 FEB 1520	113	.02	.00	.02	25.
11 FEB 0920	41	.02	.02	.01	4.	*	11 FEB 1525	114	.02	.00	.02	25.
11 FEB 0925	42	.02	.02	.01	5.	*	11 FEB 1530	115	.02	.00	.02	25.
11 FEB 0930	43	.02	.02	.01	5.	*	11 FEB 1535	116	.02	.00	.02	25.
11 FEB 0935	44	.03	.02	.01	6.	*	11 FEB 1540	117	.02	.00	.02	25.
11 FEB 0940	45	.03	.02	.01	6.	*	11 FEB 1545	118	.02	.00	.02	26.
11 FEB 0945	46	.03	.02	.01	7.	*	11 FEB 1550	119	.02	.00	.02	26.
11 FEB 0950	47	.03	.02	.01	8.	*	11 FEB 1555	120	.02	.00	.02	26.
11 FEB 0955	48	.03	.02	.01	8.	*	11 FEB 1600	121	.02	.00	.02	26.
11 FEB 1000	49	.03	.02	.01	9.	*	11 FEB 1605	122	.02	.00	.01	25.
11 FEB 1005	50	.04	.02	.01	10.	*	11 FEB 1610	123	.02	.00	.01	24.
11 FEB 1010	51	.04	.02	.01	11.	*	11 FEB 1615	124	.02	.00	.01	22.
11 FEB 1015	52	.04	.02	.01	12.	*	11 FEB 1620	125	.02	.00	.01	21.
11 FEB 1020	53	.04	.02	.01	13.	*	11 FEB 1625	126	.02	.00	.01	19.
11 FEB 1025	54	.04	.02	.01	14.	*	11 FEB 1630	127	.02	.00	.01	18.
11 FEB 1030	55	.04	.02	.02	15.	*	11 FEB 1635	128	.02	.00	.01	18.
11 FEB 1035	56	.05	.03	.02	16.	*	11 FEB 1640	129	.02	.00	.01	18.
11 FEB 1040	57	.05	.03	.02	18.	*	11 FEB 1645	130	.02	.00	.01	17.
11 FEB 1045	58	.05	.03	.02	20.	*	11 FEB 1650	131	.02	.00	.01	17.
11 FEB 1050	59	.05	.02	.02	22.	*	11 FEB 1655	132	.02	.00	.01	17.
11 FEB 1055	60	.05	.02	.02	24.	*	11 FEB 1700	133	.02	.00	.01	17.
11 FEB 1100	61	.05	.02	.03	25.	*	11 FEB 1705	134	.02	.00	.01	17.
11 FEB 1105	62	.07	.03	.04	27.	*	11 FEB 1710	135	.02	.00	.01	17.
11 FEB 1110	63	.07	.03	.04	30.	*	11 FEB 1715	136	.02	.00	.01	17.
11 FEB 1115	64	.07	.03	.04	35.	*	11 FEB 1720	137	.02	.00	.01	17.
11 FEB 1120	65	.07	.03	.04	40.	*	11 FEB 1725	138	.02	.00	.01	17.
11 FEB 1125	66	.07	.03	.05	44.	*	11 FEB 1730	139	.02	.00	.01	17.
11 FEB 1130	67	.07	.03	.05	47.	*	11 FEB 1735	140	.01	.00	.01	17.
11 FEB 1135	68	.59	.18	.41	65.	*	11 FEB 1740	141	.01	.00	.01	16.
11 FEB 1140	69	.59	.14	.45	123.	*	11 FEB 1745	142	.01	.00	.01	15.
11 FEB 1145	70	.59	.11	.48	219.	*	11 FEB 1750	143	.01	.00	.01	13.
11 FEB 1150	71	.59	.09	.50	322.	*	11 FEB 1755	144	.01	.00	.01	12.
11 FEB 1155	72	.59	.07	.52	412.	*	11 FEB 1800	145	.01	.00	.01	11.
11 FEB 1200	73	.59	.06	.53	476.	*						

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TOTAL RAINFALL = 7.80, TOTAL LOSS = 2.13, TOTAL EXCESS = 5.67

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	12.00-HR
+ (CFS)	(HR)	(CFS)				
+ 504.	6.08		85.	45.	45.	45.
		(INCHES)	5.261	5.633	5.633	5.633
		(AC-FT)	42.	45.	45.	45.

CUMULATIVE AREA = .15 SQ MI

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64 KK     *    INTO3 *
          *          *
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65 HC          HYDROGRAPH COMBINATION
                    ICOMP          2  NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION INTO3
SUM OF 2 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
11 FEB 0600	1	0.	11 FEB 0905	38	3.	11 FEB 1210	75	720.	11 FEB 1515	112	65.
11 FEB 0605	2	0.	11 FEB 0910	39	3.	11 FEB 1215	76	684.	11 FEB 1520	113	64.
11 FEB 0610	3	0.	11 FEB 0915	40	4.	11 FEB 1220	77	624.	11 FEB 1525	114	63.
11 FEB 0615	4	0.	11 FEB 0920	41	4.	11 FEB 1225	78	565.	11 FEB 1530	115	62.
11 FEB 0620	5	0.	11 FEB 0925	42	5.	11 FEB 1230	79	522.	11 FEB 1535	116	62.
11 FEB 0625	6	0.	11 FEB 0930	43	5.	11 FEB 1235	80	484.	11 FEB 1540	117	61.
11 FEB 0630	7	0.	11 FEB 0935	44	6.	11 FEB 1240	81	444.	11 FEB 1545	118	61.
11 FEB 0635	8	0.	11 FEB 0940	45	7.	11 FEB 1245	82	402.	11 FEB 1550	119	60.
11 FEB 0640	9	0.	11 FEB 0945	46	7.	11 FEB 1250	83	363.	11 FEB 1555	120	60.
11 FEB 0645	10	0.	11 FEB 0950	47	8.	11 FEB 1255	84	328.	11 FEB 1600	121	60.
11 FEB 0650	11	0.	11 FEB 0955	48	9.	11 FEB 1300	85	298.	11 FEB 1605	122	59.
11 FEB 0655	12	0.	11 FEB 1000	49	10.	11 FEB 1305	86	272.	11 FEB 1610	123	58.
11 FEB 0700	13	0.	11 FEB 1005	50	10.	11 FEB 1310	87	248.	11 FEB 1615	124	56.
11 FEB 0705	14	0.	11 FEB 1010	51	11.	11 FEB 1315	88	227.	11 FEB 1620	125	53.
11 FEB 0710	15	0.	11 FEB 1015	52	13.	11 FEB 1320	89	207.	11 FEB 1625	126	51.
11 FEB 0715	16	0.	11 FEB 1020	53	14.	11 FEB 1325	90	190.	11 FEB 1630	127	50.
11 FEB 0720	17	0.	11 FEB 1025	54	16.	11 FEB 1330	91	177.	11 FEB 1635	128	49.
11 FEB 0725	18	0.	11 FEB 1030	55	17.	11 FEB 1335	92	165.	11 FEB 1640	129	48.
11 FEB 0730	19	0.	11 FEB 1035	56	18.	11 FEB 1340	93	154.	11 FEB 1645	130	47.
11 FEB 0735	20	0.	11 FEB 1040	57	20.	11 FEB 1345	94	143.	11 FEB 1650	131	46.
11 FEB 0740	21	0.	11 FEB 1045	58	23.	11 FEB 1350	95	134.	11 FEB 1655	132	45.
11 FEB 0745	22	0.	11 FEB 1050	59	26.	11 FEB 1355	96	126.	11 FEB 1700	133	44.
11 FEB 0750	23	0.	11 FEB 1055	60	28.	11 FEB 1400	97	119.	11 FEB 1705	134	44.
11 FEB 0755	24	0.	11 FEB 1100	61	30.	11 FEB 1405	98	113.	11 FEB 1710	135	43.
11 FEB 0800	25	0.	11 FEB 1105	62	33.	11 FEB 1410	99	107.	11 FEB 1715	136	43.
11 FEB 0805	26	0.	11 FEB 1110	63	38.	11 FEB 1415	100	100.	11 FEB 1720	137	42.
11 FEB 0810	27	0.	11 FEB 1115	64	44.	11 FEB 1420	101	94.	11 FEB 1725	138	42.
11 FEB 0815	28	0.	11 FEB 1120	65	50.	11 FEB 1425	102	89.	11 FEB 1730	139	41.
11 FEB 0820	29	0.	11 FEB 1125	66	56.	11 FEB 1430	103	84.	11 FEB 1735	140	41.
11 FEB 0825	30	0.	11 FEB 1130	67	61.	11 FEB 1435	104	81.	11 FEB 1740	141	40.
11 FEB 0830	31	0.	11 FEB 1135	68	82.	11 FEB 1440	105	78.	11 FEB 1745	142	38.
11 FEB 0835	32	0.	11 FEB 1140	69	146.	11 FEB 1445	106	75.	11 FEB 1750	143	36.
11 FEB 0840	33	1.	11 FEB 1145	70	253.	11 FEB 1450	107	73.	11 FEB 1755	144	34.
11 FEB 0845	34	1.	11 FEB 1150	71	379.	11 FEB 1455	108	71.	11 FEB 1800	145	33.
11 FEB 0850	35	1.	11 FEB 1155	72	504.	11 FEB 1500	109	69.			
11 FEB 0855	36	2.	11 FEB 1200	73	614.	11 FEB 1505	110	67.			
11 FEB 0900	37	2.	11 FEB 1205	74	697.	11 FEB 1510	111	66.			

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	12.00-HR
+ (CFS)	(HR)					
		(CFS)				
+ 720.	6.17		180.	95.	95.	95.
		(INCHES)	4.677	4.947	4.947	4.947
		(AC-FT)	89.	94.	94.	94.

CUMULATIVE AREA = .36 SQ MI

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

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          *            *
66 KK     *    POND3   *
          *            *
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HYDROGRAPH ROUTING DATA

67 RS STORAGE ROUTING
NSTPS 1 NUMBER OF SUBREACHES
ITYP ELEV TYPE OF INITIAL CONDITION
RSVRIC 1345.00 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

68 SV	STORAGE	.0	8.0	16.0	23.0	31.0	35.0
69 SQ	DISCHARGE	0.	40.	220.	325.	400.	440.
70 SE	ELEVATION	1344.70	1346.00	1347.00	1348.00	1349.00	1349.50

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HYDROGRAPH AT STATION POND3

DA MON HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA MON HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA MON HRMN	ORD	OUTFLOW	STORAGE	STAGE
11 FEB 0600	1	9.	1.8	1345.0	11 FEB 1005	50	4.	.8	1344.8	11 FEB 1410	99	219.	15.9	1347.0
11 FEB 0605	2	9.	1.8	1345.0	11 FEB 1010	51	4.	.9	1344.8	11 FEB 1415	100	202.	15.2	1346.9
11 FEB 0610	3	9.	1.7	1345.0	11 FEB 1015	52	5.	.9	1344.8	11 FEB 1420	101	187.	14.5	1346.8
11 FEB 0615	4	8.	1.7	1345.0	11 FEB 1020	53	5.	1.0	1344.9	11 FEB 1425	102	173.	13.9	1346.7
11 FEB 0620	5	8.	1.6	1345.0	11 FEB 1025	54	5.	1.0	1344.9	11 FEB 1430	103	161.	13.4	1346.7
11 FEB 0625	6	8.	1.6	1345.0	11 FEB 1030	55	6.	1.1	1344.9	11 FEB 1435	104	150.	12.9	1346.6
11 FEB 0630	7	8.	1.5	1344.9	11 FEB 1035	56	6.	1.2	1344.9	11 FEB 1440	105	139.	12.4	1346.6
11 FEB 0635	8	7.	1.5	1344.9	11 FEB 1040	57	6.	1.3	1344.9	11 FEB 1445	106	130.	12.0	1346.5
11 FEB 0640	9	7.	1.4	1344.9	11 FEB 1045	58	7.	1.4	1344.9	11 FEB 1450	107	122.	11.7	1346.5
11 FEB 0645	10	7.	1.4	1344.9	11 FEB 1050	59	8.	1.5	1344.9	11 FEB 1455	108	115.	11.3	1346.4
11 FEB 0650	11	7.	1.3	1344.9	11 FEB 1055	60	8.	1.6	1345.0	11 FEB 1500	109	108.	11.0	1346.4
11 FEB 0655	12	6.	1.3	1344.9	11 FEB 1100	61	9.	1.8	1345.0	11 FEB 1505	110	103.	10.8	1346.3
11 FEB 0700	13	6.	1.2	1344.9	11 FEB 1105	62	10.	1.9	1345.0	11 FEB 1510	111	97.	10.6	1346.3
11 FEB 0705	14	6.	1.2	1344.9	11 FEB 1110	63	11.	2.1	1345.0	11 FEB 1515	112	93.	10.3	1346.3
11 FEB 0710	15	6.	1.1	1344.9	11 FEB 1115	64	12.	2.3	1345.1	11 FEB 1520	113	89.	10.2	1346.3
11 FEB 0715	16	6.	1.1	1344.9	11 FEB 1120	65	13.	2.6	1345.1	11 FEB 1525	114	85.	10.0	1346.3
11 FEB 0720	17	5.	1.1	1344.9	11 FEB 1125	66	14.	2.8	1345.2	11 FEB 1530	115	82.	9.9	1346.2
11 FEB 0725	18	5.	1.0	1344.9	11 FEB 1130	67	16.	3.1	1345.2	11 FEB 1535	116	79.	9.7	1346.2
11 FEB 0730	19	5.	1.0	1344.9	11 FEB 1135	68	18.	3.5	1345.3	11 FEB 1540	117	76.	9.6	1346.2
11 FEB 0735	20	5.	1.0	1344.9	11 FEB 1140	69	21.	4.2	1345.4	11 FEB 1545	118	74.	9.5	1346.2
11 FEB 0740	21	5.	.9	1344.9	11 FEB 1145	70	27.	5.4	1345.6	11 FEB 1550	119	72.	9.4	1346.2
11 FEB 0745	22	4.	.9	1344.8	11 FEB 1150	71	37.	7.3	1345.9	11 FEB 1555	120	70.	9.4	1346.2
11 FEB 0750	23	4.	.9	1344.8	11 FEB 1155	72	84.	10.0	1346.2	11 FEB 1600	121	69.	9.3	1346.2
11 FEB 0755	24	4.	.8	1344.8	11 FEB 1200	73	152.	13.0	1346.6	11 FEB 1605	122	68.	9.2	1346.2
11 FEB 0800	25	4.	.8	1344.8	11 FEB 1205	74	223.	16.2	1347.0	11 FEB 1610	123	66.	9.2	1346.1
11 FEB 0805	26	4.	.8	1344.8	11 FEB 1210	75	271.	19.4	1347.5	11 FEB 1615	124	65.	9.1	1346.1
11 FEB 0810	27	4.	.8	1344.8	11 FEB 1215	76	313.	22.2	1347.9	11 FEB 1620	125	63.	9.0	1346.1
11 FEB 0815	28	4.	.7	1344.8	11 FEB 1220	77	339.	24.5	1348.2	11 FEB 1625	126	62.	9.0	1346.1
11 FEB 0820	29	4.	.7	1344.8	11 FEB 1225	78	355.	26.2	1348.4	11 FEB 1630	127	60.	8.9	1346.1
11 FEB 0825	30	3.	.7	1344.8	11 FEB 1230	79	367.	27.4	1348.6	11 FEB 1635	128	59.	8.8	1346.1
11 FEB 0830	31	3.	.7	1344.8	11 FEB 1235	80	375.	28.4	1348.7	11 FEB 1640	129	57.	8.8	1346.1
11 FEB 0835	32	3.	.6	1344.8	11 FEB 1240	81	381.	29.0	1348.7	11 FEB 1645	130	56.	8.7	1346.1
11 FEB 0840	33	3.	.6	1344.8	11 FEB 1245	82	383.	29.2	1348.8	11 FEB 1650	131	54.	8.6	1346.1
11 FEB 0845	34	3.	.6	1344.8	11 FEB 1250	83	383.	29.2	1348.8	11 FEB 1655	132	53.	8.6	1346.1
11 FEB 0850	35	3.	.6	1344.8	11 FEB 1255	84	381.	29.0	1348.7	11 FEB 1700	133	52.	8.5	1346.1
11 FEB 0855	36	3.	.6	1344.8	11 FEB 1300	85	377.	28.5	1348.7	11 FEB 1705	134	51.	8.5	1346.1
11 FEB 0900	37	3.	.6	1344.8	11 FEB 1305	86	371.	27.9	1348.6	11 FEB 1710	135	50.	8.4	1346.1
11 FEB 0905	38	3.	.6	1344.8	11 FEB 1310	87	364.	27.2	1348.5	11 FEB 1715	136	49.	8.4	1346.0
11 FEB 0910	39	3.	.6	1344.8	11 FEB 1315	88	356.	26.3	1348.4	11 FEB 1720	137	48.	8.3	1346.0
11 FEB 0915	40	3.	.6	1344.8	11 FEB 1320	89	347.	25.4	1348.3	11 FEB 1725	138	47.	8.3	1346.0
11 FEB 0920	41	3.	.6	1344.8	11 FEB 1325	90	338.	24.4	1348.2	11 FEB 1730	139	46.	8.3	1346.0
11 FEB 0925	42	3.	.6	1344.8	11 FEB 1330	91	329.	23.4	1348.0	11 FEB 1735	140	45.	8.2	1346.0
11 FEB 0930	43	3.	.6	1344.8	11 FEB 1335	92	315.	22.3	1347.9	11 FEB 1740	141	45.	8.2	1346.0
11 FEB 0935	44	3.	.6	1344.8	11 FEB 1340	93	300.	21.3	1347.8	11 FEB 1745	142	44.	8.2	1346.0
11 FEB 0940	45	3.	.6	1344.8	11 FEB 1345	94	285.	20.3	1347.6	11 FEB 1750	143	43.	8.1	1346.0
11 FEB 0945	46	3.	.7	1344.8	11 FEB 1350	95	271.	19.4	1347.5	11 FEB 1755	144	42.	8.1	1346.0
11 FEB 0950	47	4.	.7	1344.8	11 FEB 1355	96	257.	18.4	1347.3	11 FEB 1800	145	41.	8.0	1346.0
11 FEB 0955	48	4.	.7	1344.8	11 FEB 1400	97	244.	17.6	1347.2					
11 FEB 1000	49	4.	.8	1344.8	11 FEB 1405	98	231.	16.7	1347.1					

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	12.00-HR
+ (CFS)	(HR)				

+ 383.	6.75	(CFS)	170.	89.	89.	89.
		(INCHES)	4.427	4.624	4.624	4.624
		(AC-FT)	84.	88.	88.	88.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	12.00-HR
+ (AC-FT) 29.	(HR) 6.75	15.	8.	8.	8.

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	12.00-HR
+ (FEET) 1348.78	(HR) 6.75	1346.90	1345.92	1345.92	1345.92

CUMULATIVE AREA = .36 SQ MI

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71 KK   * BASIN4 *
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9 IN TIME DATA FOR INPUT TIME SERIES
JXMIN 30 TIME INTERVAL IN MINUTES
JXDATE 11FEB93 STARTING DATE
JXTIME 600 STARTING TIME

SUBBASIN RUNOFF DATA

72 BA SUBBASIN CHARACTERISTICS
TAREA .02 SUBBASIN AREA

PRECIPITATION DATA

73 PB STORM 7.80 BASIN TOTAL PRECIPITATION

74 PI INCREMENTAL PRECIPITATION PATTERN

.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.01	.01	.06	.06	.06	.06
.06	.06	.01	.01	.01	.01	.01	.01	.01	.01
.01	.01	.01	.01	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
.00	.00	.00	.00						

78 LS SCS LOSS RATE
STRTL .63 INITIAL ABSTRACTION
CRVNBR 76.00 CURVE NUMBER
RTIMP .00 PERCENT IMPERVIOUS AREA

79 UD SCS DIMENSIONLESS UNITGRAPH
TLAG .25 LAG

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WARNING *** TIME INTERVAL IS GREATER THAN .29*LAG

UNIT HYDROGRAPH
17 END-OF-PERIOD ORDINATES

6.	19.	30.	30.	23.	14.	9.	6.	4.	2.
1.	1.	1.	0.	0.	0.	0.			

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HYDROGRAPH AT STATION BASIN4

DA MON HRMN	ORD	RAIN	LOSS	EXCESS	COMP Q
11 FEB 0600	1	.00	.00	.00	0.
11 FEB 0605	2	.02	.02	.00	0.
11 FEB 0610	3	.02	.02	.00	0.
11 FEB 0615	4	.02	.02	.00	0.
11 FEB 0620	5	.02	.02	.00	0.
11 FEB 0625	6	.02	.02	.00	0.
11 FEB 0630	7	.02	.02	.00	0.
11 FEB 0635	8	.02	.02	.00	0.
11 FEB 0640	9	.02	.02	.00	0.
11 FEB 0645	10	.02	.02	.00	0.
11 FEB 0650	11	.02	.02	.00	0.
11 FEB 0655	12	.02	.02	.00	0.
11 FEB 0700	13	.02	.02	.00	0.
11 FEB 0705	14	.02	.02	.00	0.
11 FEB 0710	15	.02	.02	.00	0.
11 FEB 0715	16	.02	.02	.00	0.
11 FEB 0720	17	.02	.02	.00	0.
11 FEB 0725	18	.02	.02	.00	0.
11 FEB 0730	19	.02	.02	.00	0.
11 FEB 0735	20	.02	.02	.00	0.
11 FEB 0740	21	.02	.02	.00	0.
11 FEB 0745	22	.02	.02	.00	0.
11 FEB 0750	23	.02	.02	.00	0.
11 FEB 0755	24	.02	.02	.00	0.
11 FEB 0800	25	.02	.02	.00	0.
11 FEB 0805	26	.02	.02	.00	0.
11 FEB 0810	27	.02	.02	.00	0.
11 FEB 0815	28	.02	.02	.00	0.
11 FEB 0820	29	.02	.02	.00	0.
11 FEB 0825	30	.02	.02	.00	0.
11 FEB 0830	31	.02	.02	.00	0.
11 FEB 0835	32	.02	.02	.00	0.
11 FEB 0840	33	.02	.02	.00	0.
11 FEB 0845	34	.02	.02	.00	0.
11 FEB 0850	35	.02	.02	.00	0.
11 FEB 0855	36	.02	.02	.00	0.
11 FEB 0900	37	.02	.02	.00	0.
11 FEB 0905	38	.02	.02	.00	0.
11 FEB 0910	39	.02	.02	.00	0.
11 FEB 0915	40	.02	.02	.00	0.
11 FEB 0920	41	.02	.02	.00	0.
11 FEB 0925	42	.02	.02	.00	0.
11 FEB 0930	43	.02	.02	.00	0.
11 FEB 0935	44	.03	.03	.00	0.
11 FEB 0940	45	.03	.02	.00	0.
11 FEB 0945	46	.03	.02	.00	0.
11 FEB 0950	47	.03	.02	.00	0.
11 FEB 0955	48	.03	.02	.00	0.
11 FEB 1000	49	.03	.02	.00	0.
11 FEB 1005	50	.04	.03	.01	1.
11 FEB 1010	51	.04	.03	.01	1.
11 FEB 1015	52	.04	.03	.01	1.
11 FEB 1020	53	.04	.03	.01	1.
11 FEB 1025	54	.04	.03	.01	1.
11 FEB 1030	55	.04	.03	.01	1.
11 FEB 1035	56	.05	.03	.01	1.
11 FEB 1040	57	.05	.03	.01	1.
11 FEB 1045	58	.05	.03	.01	1.
11 FEB 1050	59	.05	.03	.02	2.
11 FEB 1055	60	.05	.03	.02	2.
11 FEB 1100	61	.05	.03	.02	2.
11 FEB 1105	62	.07	.05	.03	2.
11 FEB 1110	63	.07	.04	.03	3.
11 FEB 1115	64	.07	.04	.03	3.
11 FEB 1120	65	.07	.04	.03	4.
11 FEB 1125	66	.07	.04	.03	4.
11 FEB 1130	67	.07	.04	.04	4.
11 FEB 1135	68	.59	.27	.32	6.
11 FEB 1140	69	.59	.21	.38	12.
11 FEB 1145	70	.59	.17	.42	22.
11 FEB 1150	71	.59	.14	.45	34.
11 FEB 1155	72	.59	.12	.47	44.
11 FEB 1200	73	.59	.10	.49	52.
11 FEB 1205	74	.11	.02	.09	56.
11 FEB 1210	75	.11	.02	.10	53.
11 FEB 1215	76	.11	.02	.10	44.
11 FEB 1220	77	.11	.02	.10	35.
11 FEB 1225	78	.11	.02	.10	27.
11 FEB 1230	79	.11	.02	.10	22.
11 FEB 1235	80	.06	.01	.05	19.
11 FEB 1240	81	.06	.01	.05	16.
11 FEB 1245	82	.06	.01	.05	14.
11 FEB 1250	83	.06	.01	.05	11.
11 FEB 1255	84	.06	.01	.05	10.
11 FEB 1300	85	.06	.01	.05	9.
11 FEB 1305	86	.04	.01	.04	8.
11 FEB 1310	87	.04	.01	.04	8.
11 FEB 1315	88	.04	.01	.04	7.
11 FEB 1320	89	.04	.01	.04	6.
11 FEB 1325	90	.04	.00	.04	6.
11 FEB 1330	91	.04	.00	.04	6.
11 FEB 1335	92	.03	.00	.03	6.
11 FEB 1340	93	.03	.00	.03	5.
11 FEB 1345	94	.03	.00	.03	5.
11 FEB 1350	95	.03	.00	.03	5.
11 FEB 1355	96	.03	.00	.03	5.
11 FEB 1400	97	.03	.00	.03	4.
11 FEB 1405	98	.02	.00	.02	4.
11 FEB 1410	99	.02	.00	.02	4.
11 FEB 1415	100	.02	.00	.02	4.
11 FEB 1420	101	.02	.00	.02	4.
11 FEB 1425	102	.02	.00	.02	3.
11 FEB 1430	103	.02	.00	.02	3.
11 FEB 1435	104	.02	.00	.02	3.
11 FEB 1440	105	.02	.00	.02	3.
11 FEB 1445	106	.02	.00	.02	3.
11 FEB 1450	107	.02	.00	.02	3.
11 FEB 1455	108	.02	.00	.02	3.
11 FEB 1500	109	.02	.00	.02	3.
11 FEB 1505	110	.02	.00	.02	3.
11 FEB 1510	111	.02	.00	.02	3.
11 FEB 1515	112	.02	.00	.02	3.
11 FEB 1520	113	.02	.00	.02	3.
11 FEB 1525	114	.02	.00	.02	3.
11 FEB 1530	115	.02	.00	.02	3.
11 FEB 1535	116	.02	.00	.02	3.
11 FEB 1540	117	.02	.00	.02	3.
11 FEB 1545	118	.02	.00	.02	3.
11 FEB 1550	119	.02	.00	.02	3.
11 FEB 1555	120	.02	.00	.02	3.
11 FEB 1600	121	.02	.00	.02	3.
11 FEB 1605	122	.02	.00	.01	3.
11 FEB 1610	123	.02	.00	.01	3.
11 FEB 1615	124	.02	.00	.01	3.
11 FEB 1620	125	.02	.00	.01	2.
11 FEB 1625	126	.02	.00	.01	2.
11 FEB 1630	127	.02	.00	.01	2.
11 FEB 1635	128	.02	.00	.01	2.
11 FEB 1640	129	.02	.00	.01	2.
11 FEB 1645	130	.02	.00	.01	2.
11 FEB 1650	131	.02	.00	.01	2.
11 FEB 1655	132	.02	.00	.01	2.
11 FEB 1700	133	.02	.00	.01	2.
11 FEB 1705	134	.02	.00	.01	2.
11 FEB 1710	135	.02	.00	.01	2.
11 FEB 1715	136	.02	.00	.01	2.
11 FEB 1720	137	.02	.00	.01	2.
11 FEB 1725	138	.02	.00	.01	2.
11 FEB 1730	139	.02	.00	.01	2.
11 FEB 1735	140	.01	.00	.01	2.
11 FEB 1740	141	.01	.00	.01	2.
11 FEB 1745	142	.01	.00	.01	2.
11 FEB 1750	143	.01	.00	.01	1.
11 FEB 1755	144	.01	.00	.01	1.
11 FEB 1800	145	.01	.00	.01	1.

TOTAL RAINFALL = 7.80, TOTAL LOSS = 2.82, TOTAL EXCESS = 4.98

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	12.00-HR
+	(CFS)	(HR)					
			(CFS)				
+	56.	6.08		9.	5.	5.	5.
			(INCHES)	4.679	4.940	4.940	4.940
			(AC-FT)	5.	5.	5.	5.

CUMULATIVE AREA = .02 SQ MI

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 80 KK         *    INT04   *
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81 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

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HYDROGRAPH AT STATION INT04
SUM OF 2 HYDROGRAPHS

DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW	DA MON HRMN	ORD	FLOW
11 FEB 0600	1	9.	11 FEB 0905	38	3.	11 FEB 1210	75	324.	11 FEB 1515	112	96.
11 FEB 0605	2	9.	11 FEB 0910	39	3.	11 FEB 1215	76	358.	11 FEB 1520	113	92.
11 FEB 0610	3	9.	11 FEB 0915	40	3.	11 FEB 1220	77	374.	11 FEB 1525	114	88.
11 FEB 0615	4	8.	11 FEB 0920	41	3.	11 FEB 1225	78	382.	11 FEB 1530	115	85.
11 FEB 0620	5	8.	11 FEB 0925	42	3.	11 FEB 1230	79	389.	11 FEB 1535	116	82.
11 FEB 0625	6	8.	11 FEB 0930	43	3.	11 FEB 1235	80	394.	11 FEB 1540	117	79.
11 FEB 0630	7	8.	11 FEB 0935	44	3.	11 FEB 1240	81	397.	11 FEB 1545	118	77.
11 FEB 0635	8	7.	11 FEB 0940	45	3.	11 FEB 1245	82	397.	11 FEB 1550	119	75.
11 FEB 0640	9	7.	11 FEB 0945	46	4.	11 FEB 1250	83	395.	11 FEB 1555	120	74.
11 FEB 0645	10	7.	11 FEB 0950	47	4.	11 FEB 1255	84	391.	11 FEB 1600	121	72.
11 FEB 0650	11	7.	11 FEB 0955	48	4.	11 FEB 1300	85	386.	11 FEB 1605	122	71.
11 FEB 0655	12	6.	11 FEB 1000	49	4.	11 FEB 1305	86	379.	11 FEB 1610	123	69.
11 FEB 0700	13	6.	11 FEB 1005	50	5.	11 FEB 1310	87	372.	11 FEB 1615	124	68.
11 FEB 0705	14	6.	11 FEB 1010	51	5.	11 FEB 1315	88	363.	11 FEB 1620	125	66.
11 FEB 0710	15	6.	11 FEB 1015	52	5.	11 FEB 1320	89	354.	11 FEB 1625	126	64.
11 FEB 0715	16	6.	11 FEB 1020	53	6.	11 FEB 1325	90	344.	11 FEB 1630	127	62.
11 FEB 0720	17	5.	11 FEB 1025	54	6.	11 FEB 1330	91	334.	11 FEB 1635	128	61.
11 FEB 0725	18	5.	11 FEB 1030	55	7.	11 FEB 1335	92	321.	11 FEB 1640	129	59.
11 FEB 0730	19	5.	11 FEB 1035	56	7.	11 FEB 1340	93	305.	11 FEB 1645	130	58.
11 FEB 0735	20	5.	11 FEB 1040	57	8.	11 FEB 1345	94	290.	11 FEB 1650	131	56.
11 FEB 0740	21	5.	11 FEB 1045	58	8.	11 FEB 1350	95	275.	11 FEB 1655	132	55.
11 FEB 0745	22	4.	11 FEB 1050	59	9.	11 FEB 1355	96	261.	11 FEB 1700	133	54.
11 FEB 0750	23	4.	11 FEB 1055	60	10.	11 FEB 1400	97	248.	11 FEB 1705	134	53.
11 FEB 0755	24	4.	11 FEB 1100	61	11.	11 FEB 1405	98	235.	11 FEB 1710	135	52.
11 FEB 0800	25	4.	11 FEB 1105	62	12.	11 FEB 1410	99	223.	11 FEB 1715	136	51.
11 FEB 0805	26	4.	11 FEB 1110	63	13.	11 FEB 1415	100	206.	11 FEB 1720	137	50.
11 FEB 0810	27	4.	11 FEB 1115	64	15.	11 FEB 1420	101	191.	11 FEB 1725	138	49.
11 FEB 0815	28	4.	11 FEB 1120	65	16.	11 FEB 1425	102	177.	11 FEB 1730	139	48.
11 FEB 0820	29	4.	11 FEB 1125	66	18.	11 FEB 1430	103	164.	11 FEB 1735	140	47.
11 FEB 0825	30	3.	11 FEB 1130	67	20.	11 FEB 1435	104	153.	11 FEB 1740	141	47.
11 FEB 0830	31	3.	11 FEB 1135	68	24.	11 FEB 1440	105	143.	11 FEB 1745	142	46.
11 FEB 0835	32	3.	11 FEB 1140	69	33.	11 FEB 1445	106	133.	11 FEB 1750	143	44.
11 FEB 0840	33	3.	11 FEB 1145	70	49.	11 FEB 1450	107	125.	11 FEB 1755	144	43.
11 FEB 0845	34	3.	11 FEB 1150	71	70.	11 FEB 1455	108	118.	11 FEB 1800	145	42.
11 FEB 0850	35	3.	11 FEB 1155	72	128.	11 FEB 1500	109	111.			
11 FEB 0855	36	3.	11 FEB 1200	73	204.	11 FEB 1505	110	106.			
11 FEB 0900	37	3.	11 FEB 1205	74	279.	11 FEB 1510	111	100.			

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

			6-HR	24-HR	72-HR	12.00-HR
+ (CFS)	(HR)	(CFS)				
+ 397.	6.75		179.	94.	94.	94.
		(INCHES)	4.425	4.639	4.639	4.639
		(AC-FT)	89.	93.	93.	93.

CUMULATIVE AREA = .38 SQ MI

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          *             *
82 KK     *    POND4    *
          *             *
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HYDROGRAPH ROUTING DATA

83 RS STORAGE ROUTING
NSTPS 1 NUMBER OF SUBREACHES
ITYP ELEV TYPE OF INITIAL CONDITION
RSVRIC 1344.70 INITIAL CONDITION
X .00 WORKING R AND D COEFFICIENT

84 SV	STORAGE	.0	.6	1.1	1.7	2.3	2.8
85 SQ	DISCHARGE	0.	40.	210.	350.	450.	530.
86 SE	ELEVATION	1344.70	1345.70	1346.70	1347.70	1348.70	1349.70

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*** WARNING *** MODIFIED PULS ROUTING MAY BE NUMERICALLY UNSTABLE FOR OUTFLOWS BETWEEN 40. TO 210.
THE ROUTED HYDROGRAPH SHOULD BE EXAMINED FOR OSCILLATIONS OR OUTFLOWS GREATER THAN PEAK INFLOWS.
THIS CAN BE CORRECTED BY DECREASING THE TIME INTERVAL OR INCREASING STORAGE (USE A LONGER REACH.)

HYDROGRAPH AT STATION POND4

DA MON HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA MON HRMN	ORD	OUTFLOW	STORAGE	STAGE	DA MON HRMN	ORD	OUTFLOW	STORAGE	STAGE
11 FEB 0600	1	0.	.0	1344.7	11 FEB 1005	50	4.	.1	1344.8	11 FEB 1410	99	231.	1.2	1346.8
11 FEB 0605	2	3.	.1	1344.8	11 FEB 1010	51	4.	.1	1344.8	11 FEB 1415	100	216.	1.1	1346.7
11 FEB 0610	3	5.	.1	1344.8	11 FEB 1015	52	5.	.1	1344.8	11 FEB 1420	101	198.	1.1	1346.6
11 FEB 0615	4	7.	.1	1344.9	11 FEB 1020	53	5.	.1	1344.8	11 FEB 1425	102	182.	1.0	1346.5
11 FEB 0620	5	7.	.1	1344.9	11 FEB 1025	54	5.	.1	1344.8	11 FEB 1430	103	169.	1.0	1346.5
11 FEB 0625	6	7.	.1	1344.9	11 FEB 1030	55	6.	.1	1344.8	11 FEB 1435	104	157.	.9	1346.4
11 FEB 0630	7	8.	.1	1344.9	11 FEB 1035	56	6.	.1	1344.9	11 FEB 1440	105	147.	.9	1346.3
11 FEB 0635	8	7.	.1	1344.9	11 FEB 1040	57	7.	.1	1344.9	11 FEB 1445	106	137.	.9	1346.3
11 FEB 0640	9	7.	.1	1344.9	11 FEB 1045	58	7.	.1	1344.9	11 FEB 1450	107	129.	.9	1346.2
11 FEB 0645	10	7.	.1	1344.9	11 FEB 1050	59	8.	.1	1344.9	11 FEB 1455	108	121.	.8	1346.2
11 FEB 0650	11	7.	.1	1344.9	11 FEB 1055	60	8.	.1	1344.9	11 FEB 1500	109	114.	.8	1346.1
11 FEB 0655	12	7.	.1	1344.9	11 FEB 1100	61	9.	.1	1344.9	11 FEB 1505	110	108.	.8	1346.1
11 FEB 0700	13	7.	.1	1344.9	11 FEB 1105	62	10.	.2	1345.0	11 FEB 1510	111	103.	.8	1346.1
11 FEB 0705	14	6.	.1	1344.9	11 FEB 1110	63	11.	.2	1345.0	11 FEB 1515	112	98.	.8	1346.0
11 FEB 0710	15	6.	.1	1344.9	11 FEB 1115	64	12.	.2	1345.0	11 FEB 1520	113	94.	.8	1346.0
11 FEB 0715	16	6.	.1	1344.8	11 FEB 1120	65	13.	.2	1345.0	11 FEB 1525	114	90.	.7	1346.0
11 FEB 0720	17	6.	.1	1344.8	11 FEB 1125	66	15.	.2	1345.1	11 FEB 1530	115	86.	.7	1346.0
11 FEB 0725	18	6.	.1	1344.8	11 FEB 1130	67	16.	.2	1345.1	11 FEB 1535	116	83.	.7	1346.0
11 FEB 0730	19	5.	.1	1344.8	11 FEB 1135	68	18.	.3	1345.2	11 FEB 1540	117	81.	.7	1345.9
11 FEB 0735	20	5.	.1	1344.8	11 FEB 1140	69	22.	.3	1345.3	11 FEB 1545	118	78.	.7	1345.9
11 FEB 0740	21	5.	.1	1344.8	11 FEB 1145	70	29.	.4	1345.4	11 FEB 1550	119	76.	.7	1345.9
11 FEB 0745	22	5.	.1	1344.8	11 FEB 1150	71	42.	.6	1345.7	11 FEB 1555	120	74.	.7	1345.9
11 FEB 0750	23	5.	.1	1344.8	11 FEB 1155	72	104.	.8	1346.1	11 FEB 1600	121	73.	.7	1345.9
11 FEB 0755	24	5.	.1	1344.8	11 FEB 1200	73	171.	1.0	1346.5	11 FEB 1605	122	71.	.7	1345.9
11 FEB 0800	25	4.	.1	1344.8	11 FEB 1205	74	241.	1.2	1346.9	11 FEB 1610	123	70.	.7	1345.9
11 FEB 0805	26	4.	.1	1344.8	11 FEB 1210	75	295.	1.5	1347.3	11 FEB 1615	124	68.	.7	1345.9
11 FEB 0810	27	4.	.1	1344.8	11 FEB 1215	76	336.	1.6	1347.6	11 FEB 1620	125	67.	.7	1345.9
11 FEB 0815	28	4.	.1	1344.8	11 FEB 1220	77	360.	1.8	1347.8	11 FEB 1625	126	65.	.7	1345.8
11 FEB 0820	29	4.	.1	1344.8	11 FEB 1225	78	373.	1.8	1347.9	11 FEB 1630	127	63.	.7	1345.8
11 FEB 0825	30	4.	.1	1344.8	11 FEB 1230	79	382.	1.9	1348.0	11 FEB 1635	128	62.	.7	1345.8
11 FEB 0830	31	4.	.1	1344.8	11 FEB 1235	80	389.	1.9	1348.1	11 FEB 1640	129	60.	.7	1345.8

11 FEB 0835	32	3.	.1	1344.8	*	11 FEB 1240	81	394.	2.0	1348.1	*	11 FEB 1645	130	58.	.7	1345.8
11 FEB 0840	33	3.	.0	1344.8	*	11 FEB 1245	82	396.	2.0	1348.2	*	11 FEB 1650	131	57.	.7	1345.8
11 FEB 0845	34	3.	.0	1344.8	*	11 FEB 1250	83	396.	2.0	1348.2	*	11 FEB 1655	132	56.	.6	1345.8
11 FEB 0850	35	3.	.0	1344.8	*	11 FEB 1255	84	394.	2.0	1348.1	*	11 FEB 1700	133	54.	.6	1345.8
11 FEB 0855	36	3.	.0	1344.8	*	11 FEB 1300	85	390.	1.9	1348.1	*	11 FEB 1705	134	53.	.6	1345.8
11 FEB 0900	37	3.	.0	1344.8	*	11 FEB 1305	86	384.	1.9	1348.0	*	11 FEB 1710	135	52.	.6	1345.8
11 FEB 0905	38	3.	.0	1344.8	*	11 FEB 1310	87	378.	1.9	1348.0	*	11 FEB 1715	136	51.	.6	1345.8
11 FEB 0910	39	3.	.0	1344.8	*	11 FEB 1315	88	370.	1.8	1347.9	*	11 FEB 1720	137	50.	.6	1345.8
11 FEB 0915	40	3.	.0	1344.8	*	11 FEB 1320	89	362.	1.8	1347.8	*	11 FEB 1725	138	49.	.6	1345.8
11 FEB 0920	41	3.	.0	1344.8	*	11 FEB 1325	90	352.	1.7	1347.7	*	11 FEB 1730	139	48.	.6	1345.7
11 FEB 0925	42	3.	.0	1344.8	*	11 FEB 1330	91	341.	1.7	1347.6	*	11 FEB 1735	140	48.	.6	1345.7
11 FEB 0930	43	3.	.0	1344.8	*	11 FEB 1335	92	329.	1.6	1347.5	*	11 FEB 1740	141	47.	.6	1345.7
11 FEB 0935	44	3.	.0	1344.8	*	11 FEB 1340	93	315.	1.5	1347.4	*	11 FEB 1745	142	46.	.6	1345.7
11 FEB 0940	45	3.	.0	1344.8	*	11 FEB 1345	94	299.	1.5	1347.3	*	11 FEB 1750	143	45.	.6	1345.7
11 FEB 0945	46	3.	.0	1344.8	*	11 FEB 1350	95	284.	1.4	1347.2	*	11 FEB 1755	144	44.	.6	1345.7
11 FEB 0950	47	3.	.1	1344.8	*	11 FEB 1355	96	270.	1.4	1347.1	*	11 FEB 1800	145	42.	.6	1345.7
11 FEB 0955	48	4.	.1	1344.8	*	11 FEB 1400	97	256.	1.3	1347.0	*					
11 FEB 1000	49	4.	.1	1344.8	*			243.	1.2	1346.9	*					
					*						*					

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PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	12.00-HR
+ (CFS)	(HR)	(CFS)	179.	93.	93.	93.
+ 396.	6.75	(INCHES)	4.419	4.609	4.609	4.609
		(AC-FT)	89.	93.	93.	93.

PEAK STORAGE	TIME	MAXIMUM AVERAGE STORAGE 6-HR	24-HR	72-HR	12.00-HR
+ (AC-FT)	(HR)	1.	1.	1.	1.
2.	6.75				

PEAK STAGE	TIME	MAXIMUM AVERAGE STAGE 6-HR	24-HR	72-HR	12.00-HR
+ (FEET)	(HR)	1346.59	1345.74	1345.74	1345.74
1348.16	6.75				

CUMULATIVE AREA = .38 SQ MI

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

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+	HYDROGRAPH AT	KASTEN	107.	6.42	28.	14.	14.	.06		
+	HYDROGRAPH AT	RRWEST	169.	6.25	35.	18.	18.	.08		
+	2 COMBINED AT	OFFSITE	264.	6.33	63.	33.	33.	.15		
+	HYDROGRAPH AT	BASIN1	15.	6.08	3.	1.	1.	.00		
+	HYDROGRAPH AT	BASIN2	191.	6.08	32.	17.	17.	.06		
+	3 COMBINED AT	INTO2	436.	6.17	98.	51.	51.	.21		
+	ROUTED TO	POND1$2	332.	6.42	97.	50.	50.	.21	1349.86	6.42
+	HYDROGRAPH AT	BASIN3	504.	6.08	85.	45.	45.	.15		
+	2 COMBINED AT	INTO3	720.	6.17	180.	95.	95.	.36		
+	ROUTED TO	POND3	383.	6.75	170.	89.	89.	.36	1348.78	6.75
+	HYDROGRAPH AT	BASIN4	56.	6.08	9.	5.	5.	.02		
+	2 COMBINED AT	INTO4	397.	6.75	179.	94.	94.	.38		
+	ROUTED TO	POND4	396.	6.75	179.	93.	93.	.38	1348.16	6.75

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