

**Addendum To
Drainage Study**

**I-135 POWER CENTER
Interstate 135 & Hydraulic Avenue**

Prepared for

**CITY OF WICHITA
455 North Main
7th Floor
Wichita, Kansas 67202
PR: 316-268-4736**

**August 1994
94-1598**

**KAW VALLEY
ENGINEERING**

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August 23, 1994
94-1598

**ADDENDUM TO
DRAINAGE STUDY
I-135 POWER CENTER
INTERSTATE 135 & HYDRAULIC AVENUE
Wichita, Kansas**

Upon complete development of the above mentioned subdivision the storm water runoff will be increased. In order to handle this increased runoff some sort of storm water detention facility will need to be constructed. The following two options were analyzed:

- Option 1:** Bore a 48" RCP underneath I-135 to be the principle outlet of the detention pond.
- Option 2:** Construct a detention pond with a lift station and pump the runoff to the existing 42" pipe underneath I-135.

Option 1

Presently there is a 48" RCP which outlets in the Northeast portion of the subdivision. This drainage structure is the outfall for a portion of the storm water runoff for Tulsa Street to the North. The drainage area for this offsite runoff is approximately 25.7 acres. The existing drainage areas and peak discharges for the 100 year storm are summarized below:

Location	Area	100 Year Storm
Offsite	25.7 acres	62 cfs
Onsite	<u>38.5 acres</u>	<u>57 cfs</u>
Total	64.2 acres	119 cfs

When full development is realized the combined runoff for both offsite and onsite will increase to 404 cfs. To detain the difference in runoff from existing to developed, a 13.2 acre/foot pond is required. The principle outlet of this pond would be to a 48" RCP underneath I-135 with a peak discharge of 125 cfs.

The proposed 48" pipe underneath I-135 would be constructed close to the existing 42" pipe in order to utilize the existing ditch on the South side of I-135. Because the 48" pipe would be lower than the existing pipe, the drainage channel on the South side of I-135 would need to be lowered an average of five feet for the entire 800 feet to the Arkansas River. A flap gate would also need to be installed in order to prevent water from backing onto the site during times of high water in the river.

The maximum water level in the pond would be 85.5 feet (C.O.W. Datum) and would therefore require that the top of the pond be at elevation 86.5 to have the one foot of required free board. In conjunction with this, all building pads would need to be set to at least an elevation of 86.5.

Option 2

With Option 2 no new structures are required underneath I-135. However, the required size of the detention pond increases substantially.

The existing flowline of the 42" pipe under I-135 is 84.11 (C.O.W. Datum). The proposed detention pond will have a bottom elevation of 80.0, therefore a lift station would be required in order to outlet the pond into the 42" pipe. This existing pipe was sized to handle a drainage area of 100 acres with a 25 year discharge of 56 cfs.

The lift station would be designed with two 3000 gpm pumps. At the lower water elevations one pump would come on, then as the water level increased both pumps would be activated. The maximum outflow would be 6000 gpm or 13.4 cfs. Since we would be decreasing the existing 100 year runoff by a factor of nine, the 42" pipe would be more than adequate to handle the discharge from the lift station.

With this outflow a 23.1 acre/foot detention pond would be required. The maximum water elevation realized would then be 85.9 (C.O.W. Datum) thus requiring the top of the pond and any building pads to be set at elevation 86.9

Summary Of Options

Both options would handle the increased storm water runoff adequately. Option 1 would involve the costly construction of a new structure under I-135 as well as extensive channel work on the South side of the Interstate. However, once constructed maintenance would be minimal.

Option 2 would not require any new drainage structures under I-135 but would require approximately 10 acre/foot of additional storm water runoff storage. The cost of the lift station compared with boring a 48" RCP under I-135 is substantially less. However, with a lift station there are the potential maintenance problems which must be considered.

Existing Soil Permeability

The initial development plan calls for the construction of a small manufacturing facility on Lot 1. To handle the runoff a total retention pond is proposed to be constructed with the water dissipating by percolation. To determine if this is feasible, percolation tests were conducted.

The percolation rate of the existing soil in the area of the proposed retention pond was found to be on average nine inches/minute. This is very consistent with the six to 20 inches/hour

permeability rate published in the Soil Conservation Service Soil Survey of Sedgwick County, Kansas. With this high rate of permeability the 2.4 acre/foot proposed retention pond would be more than adequate to handle the increased storm water runoff.

In the event of a storm in excess of the 100 year storm, the pond would overflow but still be contained onsite. When the water elevation reached 84.11 the runoff would flow under I-135 through the existing 42" pipe. With the proposed minimum building pad elevations stated above there would be no danger of water in the buildings.

Conclusions

Either Option 1 or Option 2 would adequately handle the increased storm water runoff. Which option is chosen is dependent on a number of factors which depend on the nature of the ultimate development as well as the approval of the Kansas Department of Transportation. Neither option considers the effect of the high rate of permeability which would only increase the factor of safety.

Regardless of which option is ultimately chosen the storm water runoff must reach the Arkansas River. The only way this can be accomplished is either by constructing a new structure under I-135 or using the existing 42" pipe.

We look forward to any questions or comments you might have regarding the subject matter contained in this report.

Thank You!



SAMUEL D. MALINOWSKY, P.E.
Project Engineer

SDM:kml

Quick TR-55 Version: 5.46 S/N:

>>>> GRAPHICAL PEAK DISCHARGE METHOD <<<<

I 135 Power Center, Wichita
Predeveloped Conditions
Entire Site with Offsite

CALCULATED
DISK FILE: 598-PRE .GPD

Drainage Area (acres) 64.2 ---> 0.1003 sq.mi.
Runoff Curve Number (CN) 80
Time of Concentration, Tc (hrs) 2.3
Rainfall Distribution (Type) II
Pond and Swamp Areas (%) 0 ---> 0.0 acres

	Storm #1	Storm #2	Storm #3
	-----	-----	-----
Frequency (years)	5	25	100
Rainfall, P, 24-hr (in)	4.8	6.5	8.2
Initial Abstraction, Ia (in)	0.500	0.500	0.500
Ia/p Ratio	0.104	0.077	0.061
Unit Discharge, * qu (csm/in)	203	204	204
Runoff, Q (in)	2.72	4.24	5.81
Pond & Swamp Adjustment Factor	1.00	1.00	1.00
PEAK DISCHARGE, qp (cfs)	55	87	119

Summary of Computations for qu

Ia/p #1	0.100	0.100	0.100
C0 #1	2.553	2.553	2.553
C1 #1	-0.615	-0.615	-0.615
C2 #1	-0.164	-0.164	-0.164
qu (csm) #1	203.827	203.827	203.827

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* I-135 Power Center *
* Pond with 48" RCP *
* outlet *
* *
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Inflow Hydrograph: C:\PONDPACK\598-POST.HYD
 Rating Table file: C:\PONDPACK\1598 .PND

----INITIAL CONDITIONS----

Elevation = 80.00 ft
 Outflow = 0.00 cfs
 Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
80.00	0.0	0.000
80.50	1.8	0.061
81.00	6.5	0.408
81.50	13.4	1.109
82.00	22.1	2.097
82.50	33.6	3.301
83.00	46.5	4.619
83.50	61.0	6.079
84.00	77.8	7.712
84.50	93.0	9.462
85.00	107.6	11.270
85.50	124.7	13.162
86.00	140.0	15.170

INTERMEDIATE ROUTING
 COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	0.0
14.8	16.6
98.8	105.3
268.5	281.9
507.5	529.6
798.8	832.4
1117.8	1164.3
1471.2	1532.2
1866.3	1944.1
2289.8	2382.8
2727.2	2834.8
3185.3	3310.0
3671.1	3811.1

Time increment (t) = 0.100 hrs.

Pond File: C:\PONDPACK\1598 .PND
 Inflow Hydrograph: C:\PONDPACK\598-POST.HYD
 Outflow Hydrograph: C:\PONDPACK\OUT .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - 0 (cfs)	2S/t + 0 (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	12.00	-----	0.0	0.0	0.00	80.00
11.100	14.00	26.0	21.4	26.0	2.30	80.55
11.200	15.00	29.0	43.2	50.4	3.59	80.69
11.300	17.00	32.0	65.4	75.2	4.91	80.83
11.400	20.00	37.0	89.7	102.4	6.35	80.98
11.500	22.00	42.0	116.7	131.7	7.53	81.07
11.600	25.00	47.0	146.1	163.7	8.78	81.17
11.700	34.00	59.0	184.3	205.1	10.40	81.28
11.800	44.00	78.0	237.0	262.3	12.64	81.44
11.900	53.00	97.0	303.6	334.0	15.23	81.61
12.000	96.00	149.0	413.8	452.6	19.39	81.84
12.100	185.00	281.0	638.0	694.8	28.37	82.27
12.200	319.00	504.0	1050.8	1142.0	45.63	82.97
12.300	404.00	723.0	1632.1	1773.8	70.85	83.79
12.400	392.00	796.0	2239.1	2428.1	94.46	84.55
12.500	294.00	686.0	2703.4	2925.1	110.85	85.10
12.600	203.00	497.0	2958.9	3200.4	120.76	85.38
12.700	147.00	350.0	3059.6	3308.9	124.66	85.50
12.800	111.00	258.0	3067.7	3317.6	124.93	85.51
12.900	91.00	202.0	3023.2	3269.7	123.25	85.46
13.000	71.00	162.0	2944.8	3185.2	120.21	85.37
13.100	62.00	133.0	2845.1	3077.8	116.34	85.26
13.200	53.00	115.0	2735.9	2960.1	112.11	85.13
13.300	48.00	101.0	2621.6	2836.9	107.67	85.00
13.400	43.00	91.0	2505.2	2712.6	103.65	84.86
13.500	41.00	84.0	2389.9	2589.2	99.67	84.73
13.600	38.00	79.0	2277.3	2468.9	95.78	84.60
13.700	36.00	74.0	2167.5	2351.3	91.91	84.46
13.800	33.00	69.0	2060.7	2236.5	87.93	84.33
13.900	32.00	65.0	1957.5	2125.7	84.09	84.21
14.000	30.00	62.0	1858.7	2019.5	80.41	84.09
14.100	29.00	59.0	1764.2	1917.7	76.72	83.97
14.200	27.00	56.0	1674.7	1820.2	72.75	83.85
14.300	26.00	53.0	1589.8	1727.7	68.97	83.74
14.400	25.00	51.0	1509.9	1640.8	65.43	83.63
14.500	24.00	49.0	1434.7	1558.9	62.09	83.53
14.600	23.00	47.0	1363.7	1481.7	59.01	83.43
14.700	22.00	45.0	1296.4	1408.7	56.13	83.33
14.800	22.00	44.0	1233.6	1340.4	53.44	83.24
14.900	22.00	44.0	1175.6	1277.6	50.96	83.15
15.000	21.00	43.0	1121.3	1218.6	48.64	83.07
15.100	21.00	42.0	1070.4	1163.3	46.46	83.00
15.200	20.00	41.0	1022.5	1111.4	44.44	82.92
15.300	20.00	40.0	977.4	1062.5	42.54	82.85
15.400	19.00	39.0	934.9	1016.4	40.75	82.78

Pond File: C:\PONDPACK\1598 .PND
 Inflow Hydrograph: C:\PONDPACK\598-POST.HYD
 Outflow Hydrograph: C:\PONDPACK\OUT .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - 0 (cfs)	2S/t + 0 (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	19.00	38.0	894.8	972.9	39.06	82.71
15.600	19.00	38.0	857.8	932.8	37.50	82.65
15.700	18.00	37.0	822.8	894.8	36.03	82.59
15.800	18.00	36.0	789.5	858.8	34.62	82.54
15.900	17.00	35.0	757.9	824.5	33.30	82.49
16.000	17.00	34.0	727.8	791.9	32.06	82.43
16.100	17.00	34.0	699.9	761.8	30.92	82.38
16.200	16.00	33.0	673.3	732.9	29.82	82.34
16.300	16.00	32.0	647.8	705.3	28.77	82.29
16.400	15.00	31.0	623.2	678.8	27.76	82.25
16.500	15.00	30.0	599.6	653.2	26.79	82.20
16.600	15.00	30.0	577.8	629.6	25.90	82.17
16.700	15.00	30.0	557.7	607.8	25.07	82.13
16.800	14.00	29.0	538.2	586.7	24.27	82.09
16.900	14.00	28.0	519.2	566.2	23.49	82.06
17.000	14.00	28.0	501.7	547.2	22.77	82.03
17.100	14.00	28.0	485.5	529.7	22.10	82.00
17.200	14.00	28.0	470.4	513.5	21.53	81.97
17.300	14.00	28.0	456.4	498.4	21.00	81.94
17.400	14.00	28.0	443.4	484.4	20.51	81.91
17.500	14.00	28.0	431.3	471.4	20.05	81.88
17.600	14.00	28.0	420.0	459.3	19.63	81.86
17.700	13.00	27.0	408.6	447.0	19.20	81.83
17.800	13.00	26.0	397.1	434.6	18.76	81.81
17.900	12.00	25.0	385.4	422.1	18.32	81.78
18.000	12.00	24.0	373.7	409.4	17.88	81.76
18.100	12.00	24.0	362.7	397.7	17.47	81.73
18.200	12.00	24.0	352.6	386.7	17.08	81.71
18.300	12.00	24.0	343.1	376.6	16.73	81.69
18.400	12.00	24.0	334.3	367.1	16.39	81.67
18.500	12.00	24.0	326.2	358.3	16.09	81.65
18.600	11.00	23.0	317.6	349.2	15.76	81.64
18.700	11.00	22.0	308.8	339.6	15.43	81.62
18.800	11.00	22.0	300.5	330.8	15.12	81.60
18.900	11.00	22.0	292.9	322.5	14.83	81.58
19.000	11.00	22.0	285.8	314.9	14.56	81.57
19.100	11.00	22.0	279.1	307.8	14.31	81.55
19.200	11.00	22.0	273.0	301.1	14.08	81.54
19.300	11.00	22.0	267.3	295.0	13.86	81.53
19.400	11.00	22.0	262.0	289.3	13.66	81.51
19.500	10.00	21.0	256.1	283.0	13.44	81.50
19.600	10.00	20.0	249.7	276.1	13.17	81.48
19.700	10.00	20.0	243.9	269.7	12.93	81.47
19.800	10.00	20.0	238.5	263.9	12.70	81.45
19.900	10.00	20.0	233.5	258.5	12.49	81.43
20.000	10.00	20.0	228.9	253.5	12.29	81.42

Pond File: C:\PONDPACK\1598 .PND
 Inflow Hydrograph: C:\PONDPACK\598-POST.HYD
 Outflow Hydrograph: C:\PONDPACK\OUT .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - 0 (cfs)	2S/t + 0 (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	10.00	20.0	224.7	248.9	12.11	81.41
20.200	10.00	20.0	220.8	244.7	11.95	81.39
20.300	10.00	20.0	217.2	240.8	11.80	81.38
20.400	10.00	20.0	213.9	237.2	11.66	81.37
20.500	10.00	20.0	210.9	233.9	11.53	81.36
20.600	9.00	19.0	207.1	229.9	11.37	81.35
20.700	9.00	18.0	202.8	225.1	11.18	81.34
20.800	9.00	18.0	198.7	220.8	11.01	81.33
20.900	9.00	18.0	195.0	216.7	10.85	81.32
21.000	9.00	18.0	191.6	213.0	10.71	81.31
21.100	9.00	18.0	188.4	209.6	10.58	81.30
21.200	9.00	18.0	185.5	206.4	10.45	81.29
21.300	9.00	18.0	182.9	203.5	10.34	81.28
21.400	9.00	18.0	180.4	200.9	10.23	81.27
21.500	8.00	17.0	177.2	197.4	10.10	81.26
21.600	8.00	16.0	173.3	193.2	9.93	81.25
21.700	8.00	16.0	169.8	189.3	9.78	81.24
21.800	8.00	16.0	166.5	185.8	9.64	81.23
21.900	8.00	16.0	163.4	182.5	9.52	81.22
22.000	8.00	16.0	160.6	179.4	9.40	81.21
22.100	8.00	16.0	158.1	176.6	9.29	81.20
22.200	8.00	16.0	155.7	174.1	9.19	81.19
22.300	7.00	15.0	152.6	170.7	9.06	81.19
22.400	7.00	14.0	148.8	166.6	8.89	81.17
22.500	7.00	14.0	145.3	162.8	8.75	81.16
22.600	7.00	14.0	142.1	159.3	8.61	81.15
22.700	7.00	14.0	139.1	156.1	8.48	81.14
22.800	6.00	13.0	135.5	152.1	8.33	81.13
22.900	6.00	12.0	131.2	147.5	8.15	81.12
23.000	6.00	12.0	127.2	143.2	7.98	81.11
23.100	6.00	12.0	123.6	139.2	7.82	81.10
23.200	6.00	12.0	120.2	135.6	7.68	81.09
23.300	5.00	11.0	116.2	131.2	7.51	81.07
23.400	5.00	10.0	111.5	126.2	7.32	81.06
23.500	5.00	10.0	107.3	121.5	7.13	81.05
23.600	5.00	10.0	103.3	117.3	6.97	81.03
23.700	5.00	10.0	99.7	113.3	6.81	81.02
23.800	4.00	9.0	95.4	108.7	6.63	81.01
23.900	4.00	8.0	90.6	103.4	6.40	80.99
24.000	4.00	8.0	86.4	98.6	6.15	80.96
24.100	4.00	8.0	82.5	94.4	5.92	80.94
24.200	4.00	8.0	79.1	90.5	5.72	80.92
24.300	3.00	7.0	75.1	86.1	5.48	80.89
24.400	3.00	6.0	70.7	81.1	5.22	80.86
24.500	3.00	6.0	66.7	76.7	4.98	80.84
24.600	3.00	6.0	63.2	72.7	4.77	80.82

POND-2 Version: 5.17 S/N:
 EXECUTED: 08-21-1994 13:20:07

Pond File: C:\PONDPACK\1598 .PND
 Inflow Hydrograph: C:\PONDPACK\598-POST.HYD
 Outflow Hydrograph: C:\PONDPACK\OUT .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - 0 (cfs)	2S/t + 0 (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	3.00	6.0	60.0	69.2	4.58	80.80
24.800	2.00	5.0	56.3	65.0	4.36	80.77
24.900	2.00	4.0	52.1	60.3	4.11	80.75
25.000	2.00	4.0	48.3	56.1	3.89	80.72
25.100	2.00	4.0	44.9	52.3	3.69	80.70
25.200	2.00	4.0	41.9	48.9	3.51	80.68
25.300	1.00	3.0	38.3	44.9	3.30	80.66
25.400	1.00	2.0	34.2	40.3	3.05	80.63
25.500	1.00	2.0	30.5	36.2	2.84	80.61
25.600	1.00	2.0	27.2	32.5	2.64	80.59
25.700	1.00	2.0	24.3	29.2	2.47	80.57
25.800	0.00	1.0	20.8	25.3	2.26	80.55
25.900	0.00	0.0	16.7	20.8	2.02	80.52

***** SUMMARY OF ROUTING COMPUTATIONS *****

Pond File: C:\PONDPACK\1598 .PND
Inflow Hydrograph: C:\PONDPACK\598-POST.HYD
Outflow Hydrograph: C:\PONDPACK\OUT .HYD

Starting Pond W.S. Elevation = 80.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 404.00 cfs
Peak Outflow = 124.93 cfs
Peak Elevation = 85.51 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 0.00 ac-ft
Peak Storage From Storm = 13.19 ac-ft

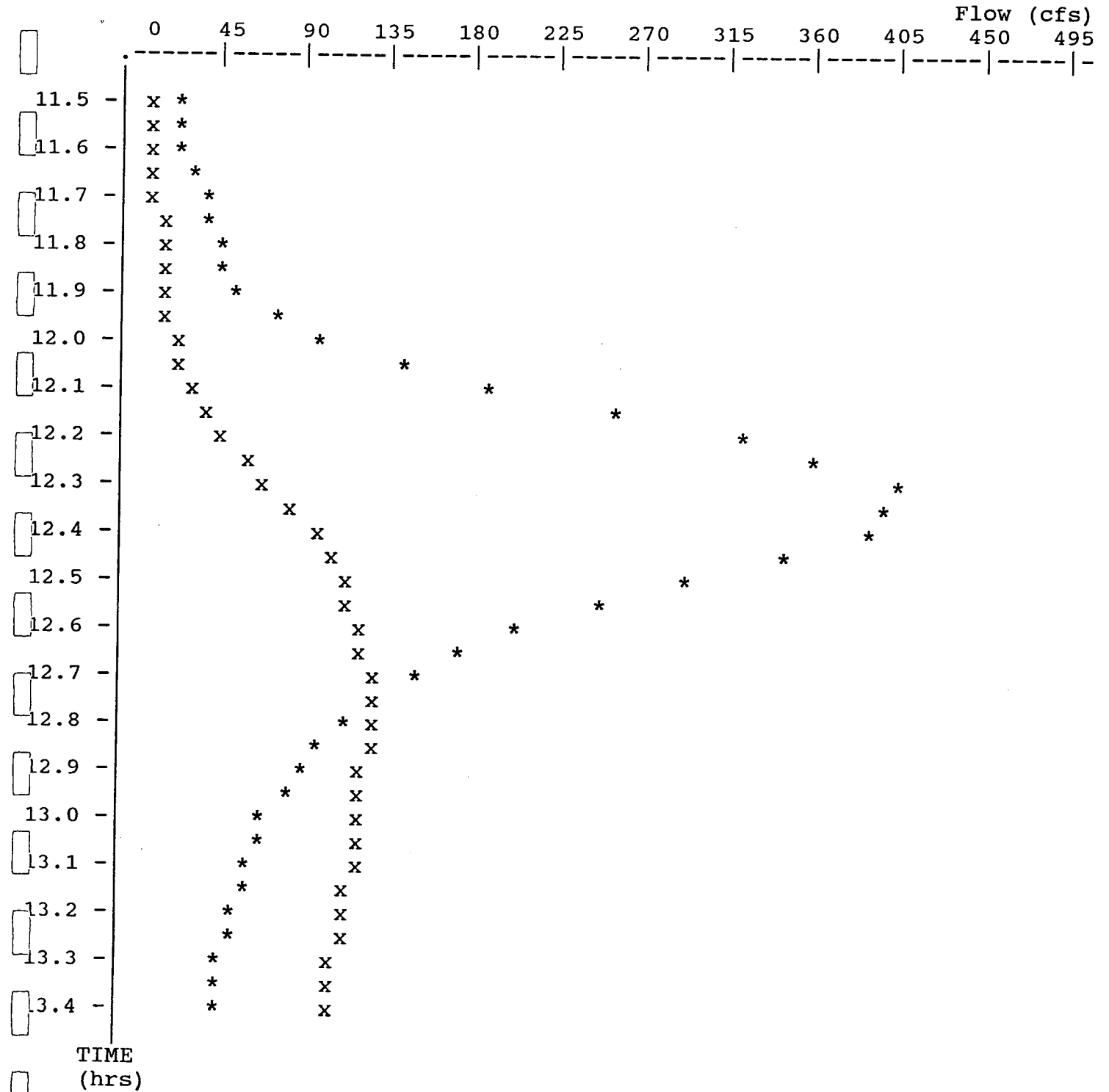
Total Storage in Pond = 13.19 ac-ft

Warning: Inflow hydrograph truncated on left side.

Pond File: C:\PONDPACK\1598 .PND
 Inflow Hydrograph: C:\PONDPACK\598-POST.HYD
 Outflow Hydrograph: C:\PONDPACK\OUT .HYD

EXECUTED: 08-21-1994
 13:20:07

Peak Inflow = 404.00 cfs
 Peak Outflow = 124.93 cfs
 Peak Elevation = 85.51 ft



* File: C:\PONDPACK\598-POST.HYD Qmax = 404.0 cfs
 X File: C:\PONDPACK\OUT .HYD Qmax = 124.9 cfs

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*   Pond With Lift Station   *
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Inflow Hydrograph: C:\PONDPACK\598-POST.HYD
 Rating Table file: C:\PONDPACK\1598A .PND

----INITIAL CONDITIONS----

Elevation = 80.00 ft
 Outflow = 6.50 cfs
 Storage = 0.00 ac-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (ac-ft)
80.00	6.5	0.000
80.50	9.8	0.070
81.00	13.0	0.425
81.50	13.0	1.126
82.00	13.0	2.114
82.50	13.0	3.561
83.00	13.0	5.697
83.50	13.0	8.307
84.00	13.0	11.089
84.50	13.0	14.043
85.00	13.0	17.169
85.50	13.0	20.440
86.00	13.0	23.825

INTERMEDIATE ROUTING
 COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	6.5
17.0	26.8
102.8	115.8
272.4	285.4
511.5	524.5
861.8	874.8
1378.8	1391.8
2010.3	2023.3
2683.4	2696.4
3398.3	3411.3
4154.9	4167.9
4946.4	4959.4
5765.7	5778.7

Time increment (t) = 0.100 hrs.

Pond File: C:\PONDPACK\1598A .PND
 Inflow Hydrograph: C:\PONDPACK\598-POST.HYD
 Outflow Hydrograph: C:\PONDPACK\OUT .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - 0 (cfs)	2S/t + 0 (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
11.000	12.00	-----	-6.5	6.5	6.50	80.00
11.100	14.00	26.0	2.3	19.5	8.61	80.32
11.200	15.00	29.0	11.4	31.3	9.96	80.53
11.300	17.00	32.0	22.6	43.4	10.39	80.59
11.400	20.00	37.0	37.6	59.6	10.98	80.68
11.500	22.00	42.0	56.2	79.6	11.70	80.80
11.600	25.00	47.0	78.1	103.2	12.55	80.93
11.700	34.00	59.0	111.1	137.1	13.00	81.06
11.800	44.00	78.0	163.1	189.1	13.00	81.22
11.900	53.00	97.0	234.1	260.1	13.00	81.43
12.000	96.00	149.0	357.1	383.1	13.00	81.70
12.100	185.00	281.0	612.1	638.1	13.00	82.16
12.200	319.00	504.0	1090.1	1116.1	13.00	82.73
12.300	404.00	723.0	1787.1	1813.1	13.00	83.33
12.400	392.00	796.0	2557.1	2583.1	13.00	83.92
12.500	294.00	686.0	3217.1	3243.1	13.00	84.38
12.600	203.00	497.0	3688.1	3714.1	13.00	84.70
12.700	147.00	350.0	4012.1	4038.1	13.00	84.91
12.800	111.00	258.0	4244.1	4270.1	13.00	85.06
12.900	91.00	202.0	4420.1	4446.1	13.00	85.18
13.000	71.00	162.0	4556.1	4582.1	13.00	85.26
13.100	62.00	133.0	4663.1	4689.1	13.00	85.33
13.200	53.00	115.0	4752.1	4778.1	13.00	85.39
13.300	48.00	101.0	4827.1	4853.1	13.00	85.43
13.400	43.00	91.0	4892.1	4918.1	13.00	85.47
13.500	41.00	84.0	4950.1	4976.1	13.00	85.51
13.600	38.00	79.0	5003.1	5029.1	13.00	85.54
13.700	36.00	74.0	5051.1	5077.1	13.00	85.57
13.800	33.00	69.0	5094.1	5120.1	13.00	85.60
13.900	32.00	65.0	5133.1	5159.1	13.00	85.62
14.000	30.00	62.0	5169.1	5195.1	13.00	85.64
14.100	29.00	59.0	5202.1	5228.1	13.00	85.66
14.200	27.00	56.0	5232.1	5258.1	13.00	85.68
14.300	26.00	53.0	5259.1	5285.1	13.00	85.70
14.400	25.00	51.0	5284.1	5310.1	13.00	85.71
14.500	24.00	49.0	5307.1	5333.1	13.00	85.73
14.600	23.00	47.0	5328.1	5354.1	13.00	85.74
14.700	22.00	45.0	5347.1	5373.1	13.00	85.75
14.800	22.00	44.0	5365.1	5391.1	13.00	85.76
14.900	22.00	44.0	5383.1	5409.1	13.00	85.77
15.000	21.00	43.0	5400.1	5426.1	13.00	85.78
15.100	21.00	42.0	5416.1	5442.1	13.00	85.79
15.200	20.00	41.0	5431.1	5457.1	13.00	85.80
15.300	20.00	40.0	5445.1	5471.1	13.00	85.81
15.400	19.00	39.0	5458.1	5484.1	13.00	85.82

Pond File: C:\PONDPACK\1598A .PND
 Inflow Hydrograph: C:\PONDPACK\598-POST.HYD
 Outflow Hydrograph: C:\PONDPACK\OUT .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - 0 (cfs)	2S/t + 0 (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
15.500	19.00	38.0	5470.1	5496.1	13.00	85.83
15.600	19.00	38.0	5482.1	5508.1	13.00	85.83
15.700	18.00	37.0	5493.1	5519.1	13.00	85.84
15.800	18.00	36.0	5503.1	5529.1	13.00	85.85
15.900	17.00	35.0	5512.1	5538.1	13.00	85.85
16.000	17.00	34.0	5520.1	5546.1	13.00	85.86
16.100	17.00	34.0	5528.1	5554.1	13.00	85.86
16.200	16.00	33.0	5535.1	5561.1	13.00	85.87
16.300	16.00	32.0	5541.1	5567.1	13.00	85.87
16.400	15.00	31.0	5546.1	5572.1	13.00	85.87
16.500	15.00	30.0	5550.1	5576.1	13.00	85.88
16.600	15.00	30.0	5554.1	5580.1	13.00	85.88
16.700	15.00	30.0	5558.1	5584.1	13.00	85.88
16.800	14.00	29.0	5561.1	5587.1	13.00	85.88
16.900	14.00	28.0	5563.1	5589.1	13.00	85.88
17.000	14.00	28.0	5565.1	5591.1	13.00	85.89
17.100	14.00	28.0	5567.1	5593.1	13.00	85.89
17.200	14.00	28.0	5569.1	5595.1	13.00	85.89
17.300	14.00	28.0	5571.1	5597.1	13.00	85.89
17.400	14.00	28.0	5573.1	5599.1	13.00	85.89
17.500	14.00	28.0	5575.1	5601.1	13.00	85.89
17.600	14.00	28.0	5577.1	5603.1	13.00	85.89
17.700	13.00	27.0	5578.1	5604.1	13.00	85.89
17.800	13.00	26.0	5578.1	5604.1	13.00	85.89
17.900	12.00	25.0	5577.1	5603.1	13.00	85.89
18.000	12.00	24.0	5575.1	5601.1	13.00	85.89
18.100	12.00	24.0	5573.1	5599.1	13.00	85.89
18.200	12.00	24.0	5571.1	5597.1	13.00	85.89
18.300	12.00	24.0	5569.1	5595.1	13.00	85.89
18.400	12.00	24.0	5567.1	5593.1	13.00	85.89
18.500	12.00	24.0	5565.1	5591.1	13.00	85.89
18.600	11.00	23.0	5562.1	5588.1	13.00	85.88
18.700	11.00	22.0	5558.1	5584.1	13.00	85.88
18.800	11.00	22.0	5554.1	5580.1	13.00	85.88
18.900	11.00	22.0	5550.1	5576.1	13.00	85.88
19.000	11.00	22.0	5546.1	5572.1	13.00	85.87
19.100	11.00	22.0	5542.1	5568.1	13.00	85.87
19.200	11.00	22.0	5538.1	5564.1	13.00	85.87
19.300	11.00	22.0	5534.1	5560.1	13.00	85.87
19.400	11.00	22.0	5530.1	5556.1	13.00	85.86
19.500	10.00	21.0	5525.1	5551.1	13.00	85.86
19.600	10.00	20.0	5519.1	5545.1	13.00	85.86
19.700	10.00	20.0	5513.1	5539.1	13.00	85.85
19.800	10.00	20.0	5507.1	5533.1	13.00	85.85
19.900	10.00	20.0	5501.1	5527.1	13.00	85.85
20.000	10.00	20.0	5495.1	5521.1	13.00	85.84

Pond File: C:\PONDPACK\1598A .PND
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 Outflow Hydrograph: C:\PONDPACK\OUT .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - 0 (cfs)	2S/t + 0 (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
20.100	10.00	20.0	5489.1	5515.1	13.00	85.84
20.200	10.00	20.0	5483.1	5509.1	13.00	85.84
20.300	10.00	20.0	5477.1	5503.1	13.00	85.83
20.400	10.00	20.0	5471.1	5497.1	13.00	85.83
20.500	10.00	20.0	5465.1	5491.1	13.00	85.82
20.600	9.00	19.0	5458.1	5484.1	13.00	85.82
20.700	9.00	18.0	5450.1	5476.1	13.00	85.82
20.800	9.00	18.0	5442.1	5468.1	13.00	85.81
20.900	9.00	18.0	5434.1	5460.1	13.00	85.81
21.000	9.00	18.0	5426.1	5452.1	13.00	85.80
21.100	9.00	18.0	5418.1	5444.1	13.00	85.80
21.200	9.00	18.0	5410.1	5436.1	13.00	85.79
21.300	9.00	18.0	5402.1	5428.1	13.00	85.79
21.400	9.00	18.0	5394.1	5420.1	13.00	85.78
21.500	8.00	17.0	5385.1	5411.1	13.00	85.78
21.600	8.00	16.0	5375.1	5401.1	13.00	85.77
21.700	8.00	16.0	5365.1	5391.1	13.00	85.76
21.800	8.00	16.0	5355.1	5381.1	13.00	85.76
21.900	8.00	16.0	5345.1	5371.1	13.00	85.75
22.000	8.00	16.0	5335.1	5361.1	13.00	85.75
22.100	8.00	16.0	5325.1	5351.1	13.00	85.74
22.200	8.00	16.0	5315.1	5341.1	13.00	85.73
22.300	7.00	15.0	5304.1	5330.1	13.00	85.73
22.400	7.00	14.0	5292.1	5318.1	13.00	85.72
22.500	7.00	14.0	5280.1	5306.1	13.00	85.71
22.600	7.00	14.0	5268.1	5294.1	13.00	85.70
22.700	7.00	14.0	5256.1	5282.1	13.00	85.70
22.800	6.00	13.0	5243.1	5269.1	13.00	85.69
22.900	6.00	12.0	5229.1	5255.1	13.00	85.68
23.000	6.00	12.0	5215.1	5241.1	13.00	85.67
23.100	6.00	12.0	5201.1	5227.1	13.00	85.66
23.200	6.00	12.0	5187.1	5213.1	13.00	85.65
23.300	5.00	11.0	5172.1	5198.1	13.00	85.65
23.400	5.00	10.0	5156.1	5182.1	13.00	85.64
23.500	5.00	10.0	5140.1	5166.1	13.00	85.63
23.600	5.00	10.0	5124.1	5150.1	13.00	85.62
23.700	5.00	10.0	5108.1	5134.1	13.00	85.61
23.800	4.00	9.0	5091.1	5117.1	13.00	85.60
23.900	4.00	8.0	5073.1	5099.1	13.00	85.59
24.000	4.00	8.0	5055.1	5081.1	13.00	85.57
24.100	4.00	8.0	5037.1	5063.1	13.00	85.56
24.200	4.00	8.0	5019.1	5045.1	13.00	85.55
24.300	3.00	7.0	5000.1	5026.1	13.00	85.54
24.400	3.00	6.0	4980.1	5006.1	13.00	85.53
24.500	3.00	6.0	4960.1	4986.1	13.00	85.52
24.600	3.00	6.0	4940.1	4966.1	13.00	85.50

POND-2 Version: 5.17 S/N:
 EXECUTED: 08-22-1994 11:16:10

Pond File: C:\PONDPACK\1598A .PND
 Inflow Hydrograph: C:\PONDPACK\598-POST.HYD
 Outflow Hydrograph: C:\PONDPACK\OUT .HYD

INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

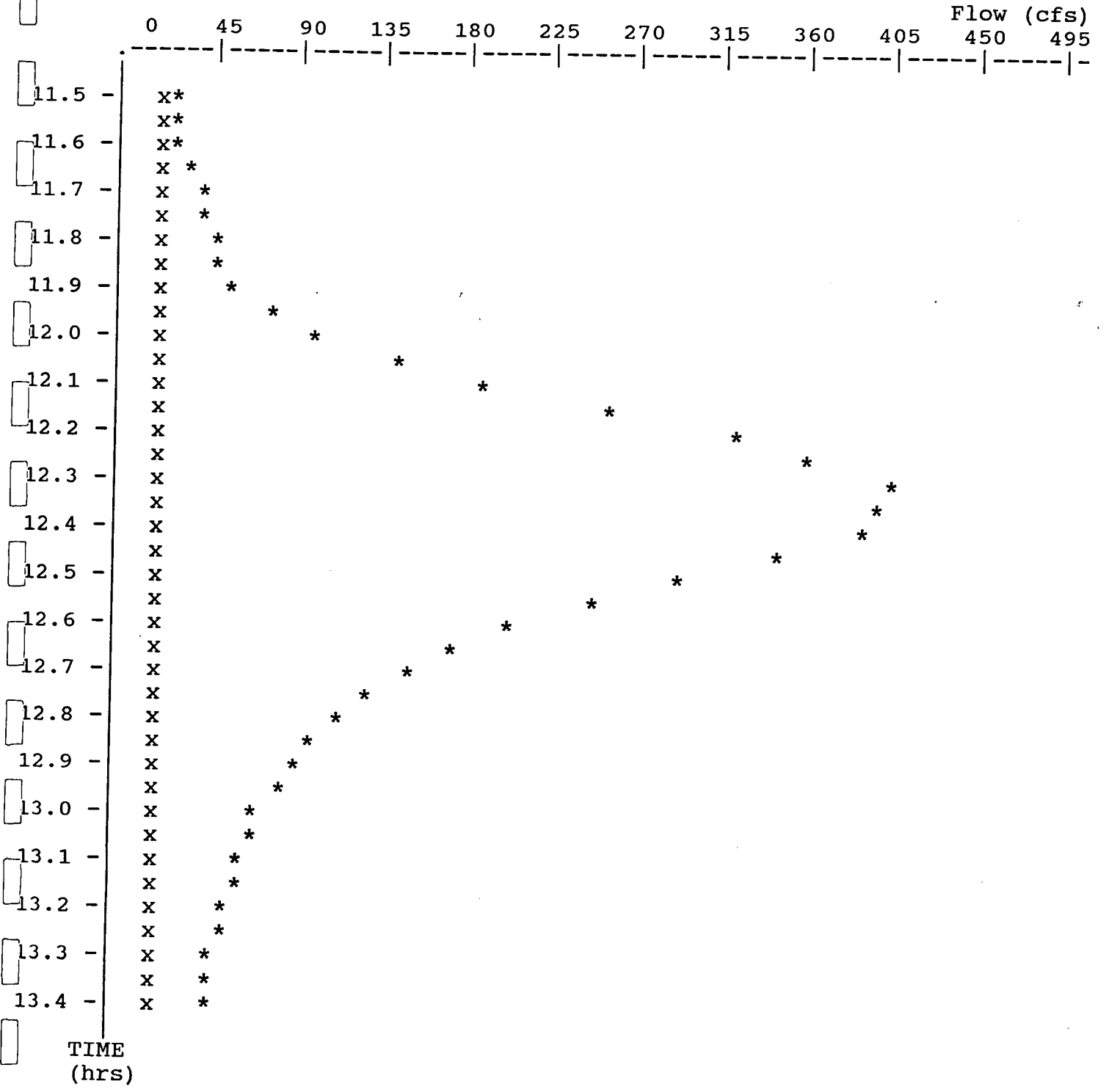
TIME (hrs)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - 0 (cfs)	2S/t + 0 (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
24.700	3.00	6.0	4920.1	4946.1	13.00	85.49
24.800	2.00	5.0	4899.1	4925.1	13.00	85.48
24.900	2.00	4.0	4877.1	4903.1	13.00	85.46
25.000	2.00	4.0	4855.1	4881.1	13.00	85.45
25.100	2.00	4.0	4833.1	4859.1	13.00	85.44
25.200	2.00	4.0	4811.1	4837.1	13.00	85.42
25.300	1.00	3.0	4788.1	4814.1	13.00	85.41
25.400	1.00	2.0	4764.1	4790.1	13.00	85.39
25.500	1.00	2.0	4740.1	4766.1	13.00	85.38
25.600	1.00	2.0	4716.1	4742.1	13.00	85.36
25.700	1.00	2.0	4692.1	4718.1	13.00	85.35
25.800	0.00	1.0	4667.1	4693.1	13.00	85.33
25.900	0.00	0.0	4641.1	4667.1	13.00	85.32

>>>>> Warning, peak outflow = last ordinate point. <<<<<<
 POND-2 Version: 5.17 S/N: Page 7

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 Outflow Hydrograph: C:\PONDPACK\OUT .HYD

EXECUTED: 08-22-1994
 11:16:10

Peak Inflow = 404.00 cfs
 Peak Outflow = 13.00 cfs
 Peak Elevation = 85.89 ft



***** SUMMARY OF ROUTING COMPUTATIONS *****

Pond File: C:\PONDPACK\1598A .PND
Inflow Hydrograph: C:\PONDPACK\598-POST.HYD
Outflow Hydrograph: C:\PONDPACK\OUT .HYD

Starting Pond W.S. Elevation = 80.00 ft

***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow = 404.00 cfs
Peak Outflow = 13.00 cfs
Peak Elevation = 85.89 ft

***** Summary of Approximate Peak Storage *****

Initial Storage = 0.00 ac-ft
Peak Storage From Storm = 23.10 ac-ft

Total Storage in Pond = 23.10 ac-ft

Warning: Inflow hydrograph truncated on left side.

>>>>> Warning, peak outflow = last ordinate point. <<<<<<