VOLZ

Engineers
Land Planners
Land Surveyors

5933 South Highway 94, Suite 201
St. Charles, Missouri 63304-5611
314-939-5155
314-939-5138 FAX

THE VILLAGES AT WALDEN POND

PHASE TWO

DETENTION HYDRAULIC REPORT

February 5, 2000

5973

VOLZ

PROJECT NR. B5973
PAGE 1 OF
DATE 2/5/00
REV. DATE

TITLE CALCULATIONS / SKETCHES
PROJ TITLE The Villages at Walden Pond
CLIENT
PROJ ADDRS

DRAWN CMC
REVIEW'D
APPROVED

Phase II stormwater detention

Phase II area = 15.82 Acres

Differential Runoff

2year storm	15.82 x (1.61 - 1.09)	= 8.23 cfs
15year storm	15.82 x (2.64 - 1.87)	= 12.18 cfs
25year storm	15.82 x (3.26 - 2.31)	= 15.03 cfs
100year storm	15.82 x (4.17 - 2.95)	= 19.30 cfs

Detention Provided

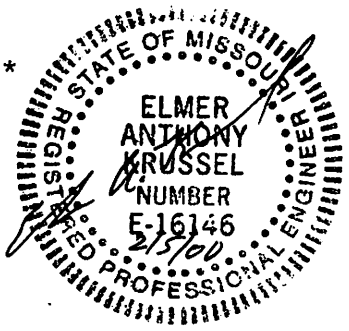
Storm	Q_{in}	-	Q_{out}	=	Detention Provided
2yr	22.81	-	3.92	=	18.89 cfs
15yr	37.41	-	4.64	=	32.77 cfs
25yr	46.19	-	4.97	=	44.22 cfs
100yr	59.09	-	5.51	=	53.58 cfs

Detention available for future phases

Storm	Detention Provided	-	Differential Runoff	=	Detention Available	
2yr	18.89	-	8.23	=	10.66 cfs	≈ 20.50 Acres
15yr	32.77	-	12.18	=	20.59 cfs	≈ 26.74 Acres
25yr	44.22	-	15.03	=	29.19 cfs	≈ 30.73 Acres
100yr	53.58	-	19.30	=	34.28 cfs	≈ 28.10 Acres

STATE OF MISSOURI
ELMER ANTHONY KRUSEL
NUMBER E-16146
REGISTERED PROFESSIONAL ENGINEER
2/5/00

BY



***** Multiply Hydrograph by Constant *****

Unit .HYD File: h:\haestad\pondpack\SLUG.HYD
Output Hydrograph: b5973\LAKE1-2 .HYD

Multiplier Constant: 22.81

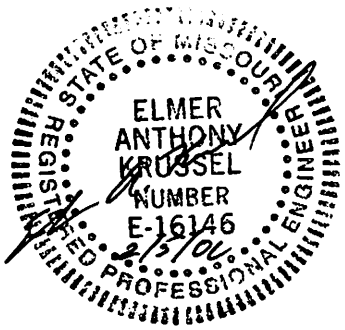
TIME (min)	Unit Ordinates		Multiplier Constant		Output Hydrograph (cfs)
0.0	1.00	x	22.810	=	22.81
1.0	1.00	x	22.810	=	22.81
2.0	1.00	x	22.810	=	22.81
3.0	1.00	x	22.810	=	22.81
4.0	1.00	x	22.810	=	22.81
5.0	1.00	x	22.810	=	22.81
6.0	1.00	x	22.810	=	22.81
7.0	1.00	x	22.810	=	22.81
8.0	1.00	x	22.810	=	22.81
9.0	1.00	x	22.810	=	22.81
10.0	1.00	x	22.810	=	22.81
11.0	1.00	x	22.810	=	22.81
12.0	1.00	x	22.810	=	22.81
13.0	1.00	x	22.810	=	22.81
14.0	1.00	x	22.810	=	22.81
15.0	1.00	x	22.810	=	22.81
16.0	1.00	x	22.810	=	22.81
17.0	1.00	x	22.810	=	22.81
18.0	1.00	x	22.810	=	22.81
19.0	1.00	x	22.810	=	22.81
20.0	1.00	x	22.810	=	22.81
21.0	1.00	x	22.810	=	22.81
22.0	1.00	x	22.810	=	22.81
23.0	1.00	x	22.810	=	22.81
24.0	1.00	x	22.810	=	22.81
25.0	1.00	x	22.810	=	22.81
26.0	1.00	x	22.810	=	22.81
27.0	1.00	x	22.810	=	22.81
28.0	1.00	x	22.810	=	22.81
29.0	1.00	x	22.810	=	22.81
30.0	0.00	x	22.810	=	0.00
31.0	0.00	x	22.810	=	0.00
32.0	0.00	x	22.810	=	0.00
33.0	0.00	x	22.810	=	0.00
34.0	0.00	x	22.810	=	0.00
35.0	0.00	x	22.810	=	0.00
36.0	0.00	x	22.810	=	0.00
37.0	0.00	x	22.810	=	0.00
38.0	0.00	x	22.810	=	0.00
39.0	0.00	x	22.810	=	0.00
40.0	0.00	x	22.810	=	0.00
41.0	0.00	x	22.810	=	0.00

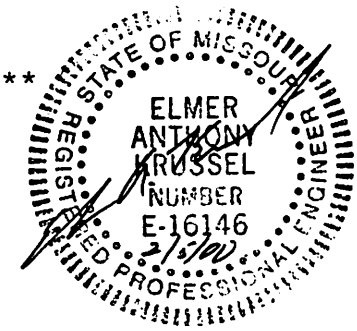
***** Multiply Hydrograph by Constant *****

Unit .HYD File: h:\haestad\pondpack\SLUG.HYD
Output Hydrograph: b5973\LAKE1-2 .HYD

Multiplier Constant: 22.81

TIME (min)	Unit Ordinates		Multiplier Constant		Output Hydrograph (cfs)
42.0	0.00	x	22.810	=	0.00
43.0	0.00	x	22.810	=	0.00
44.0	0.00	x	22.810	=	0.00
45.0	0.00	x	22.810	=	0.00
46.0	0.00	x	22.810	=	0.00
47.0	0.00	x	22.810	=	0.00
48.0	0.00	x	22.810	=	0.00
49.0	0.00	x	22.810	=	0.00
50.0	0.00	x	22.810	=	0.00
51.0	0.00	x	22.810	=	0.00
52.0	0.00	x	22.810	=	0.00
53.0	0.00	x	22.810	=	0.00
54.0	0.00	x	22.810	=	0.00
55.0	0.00	x	22.810	=	0.00
56.0	0.00	x	22.810	=	0.00
57.0	0.00	x	22.810	=	0.00
58.0	0.00	x	22.810	=	0.00
59.0	0.00	x	22.810	=	0.00
60.0	0.00	x	22.810	=	0.00





***** Multiply Hydrograph by Constant *****

Unit .HYD File: h:\haestad\pondpack\SLUG.HYD
Output Hydrograph: b5973\LAKE1-15.HYD

Multiplier Constant: 37.41

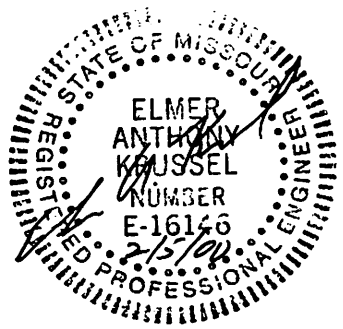
TIME (min)	Unit Ordinates		Multiplier Constant		Output Hydrograph (cfs)
0.0	1.00	x	37.410	=	37.41
1.0	1.00	x	37.410	=	37.41
2.0	1.00	x	37.410	=	37.41
3.0	1.00	x	37.410	=	37.41
4.0	1.00	x	37.410	=	37.41
5.0	1.00	x	37.410	=	37.41
6.0	1.00	x	37.410	=	37.41
7.0	1.00	x	37.410	=	37.41
8.0	1.00	x	37.410	=	37.41
9.0	1.00	x	37.410	=	37.41
10.0	1.00	x	37.410	=	37.41
11.0	1.00	x	37.410	=	37.41
12.0	1.00	x	37.410	=	37.41
13.0	1.00	x	37.410	=	37.41
14.0	1.00	x	37.410	=	37.41
15.0	1.00	x	37.410	=	37.41
16.0	1.00	x	37.410	=	37.41
17.0	1.00	x	37.410	=	37.41
18.0	1.00	x	37.410	=	37.41
19.0	1.00	x	37.410	=	37.41
20.0	1.00	x	37.410	=	37.41
21.0	1.00	x	37.410	=	37.41
22.0	1.00	x	37.410	=	37.41
23.0	1.00	x	37.410	=	37.41
24.0	1.00	x	37.410	=	37.41
25.0	1.00	x	37.410	=	37.41
26.0	1.00	x	37.410	=	37.41
27.0	1.00	x	37.410	=	37.41
28.0	1.00	x	37.410	=	37.41
29.0	1.00	x	37.410	=	37.41
30.0	0.00	x	37.410	=	0.00
31.0	0.00	x	37.410	=	0.00
32.0	0.00	x	37.410	=	0.00
33.0	0.00	x	37.410	=	0.00
34.0	0.00	x	37.410	=	0.00
35.0	0.00	x	37.410	=	0.00
36.0	0.00	x	37.410	=	0.00
37.0	0.00	x	37.410	=	0.00
38.0	0.00	x	37.410	=	0.00
39.0	0.00	x	37.410	=	0.00
40.0	0.00	x	37.410	=	0.00
41.0	0.00	x	37.410	=	0.00

***** Multiply Hydrograph by Constant *****

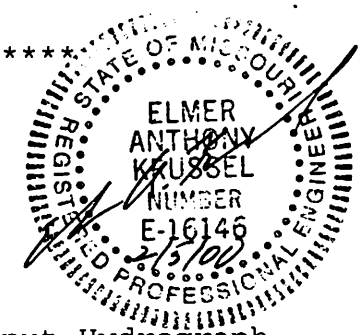
Unit .HYD File: h:\haestad\pondpack\SLUG.HYD
Output Hydrograph: b5973\LAKE1-15.HYD

Multiplier Constant: 37.41

TIME (min)	Unit Ordinates		Multiplier Constant		Output Hydrograph (cfs)
42.0	0.00	x	37.410	=	0.00
43.0	0.00	x	37.410	=	0.00
44.0	0.00	x	37.410	=	0.00
45.0	0.00	x	37.410	=	0.00
46.0	0.00	x	37.410	=	0.00
47.0	0.00	x	37.410	=	0.00
48.0	0.00	x	37.410	=	0.00
49.0	0.00	x	37.410	=	0.00
50.0	0.00	x	37.410	=	0.00
51.0	0.00	x	37.410	=	0.00
52.0	0.00	x	37.410	=	0.00
53.0	0.00	x	37.410	=	0.00
54.0	0.00	x	37.410	=	0.00
55.0	0.00	x	37.410	=	0.00
56.0	0.00	x	37.410	=	0.00
57.0	0.00	x	37.410	=	0.00
58.0	0.00	x	37.410	=	0.00
59.0	0.00	x	37.410	=	0.00
60.0	0.00	x	37.410	=	0.00



***** Multiply Hydrograph by Constant *****



Unit .HYD File: h:\haestad\pondpack\SLUG.HYD
Output Hydrograph: b5973\LAKE1-25.HYD

Multiplier Constant: 46.19

TIME (min)	Unit Ordinates		Multiplier Constant		Output Hydrograph (cfs)
0.0	1.00	x	46.190	=	46.19
1.0	1.00	x	46.190	=	46.19
2.0	1.00	x	46.190	=	46.19
3.0	1.00	x	46.190	=	46.19
4.0	1.00	x	46.190	=	46.19
5.0	1.00	x	46.190	=	46.19
6.0	1.00	x	46.190	=	46.19
7.0	1.00	x	46.190	=	46.19
8.0	1.00	x	46.190	=	46.19
9.0	1.00	x	46.190	=	46.19
10.0	1.00	x	46.190	=	46.19
11.0	1.00	x	46.190	=	46.19
12.0	1.00	x	46.190	=	46.19
13.0	1.00	x	46.190	=	46.19
14.0	1.00	x	46.190	=	46.19
15.0	1.00	x	46.190	=	46.19
16.0	1.00	x	46.190	=	46.19
17.0	1.00	x	46.190	=	46.19
18.0	1.00	x	46.190	=	46.19
19.0	1.00	x	46.190	=	46.19
20.0	1.00	x	46.190	=	46.19
21.0	1.00	x	46.190	=	46.19
22.0	1.00	x	46.190	=	46.19
23.0	1.00	x	46.190	=	46.19
24.0	1.00	x	46.190	=	46.19
25.0	1.00	x	46.190	=	46.19
26.0	1.00	x	46.190	=	46.19
27.0	1.00	x	46.190	=	46.19
28.0	1.00	x	46.190	=	46.19
29.0	1.00	x	46.190	=	46.19
30.0	0.00	x	46.190	=	0.00
31.0	0.00	x	46.190	=	0.00
32.0	0.00	x	46.190	=	0.00
33.0	0.00	x	46.190	=	0.00
34.0	0.00	x	46.190	=	0.00
35.0	0.00	x	46.190	=	0.00
36.0	0.00	x	46.190	=	0.00
37.0	0.00	x	46.190	=	0.00
38.0	0.00	x	46.190	=	0.00
39.0	0.00	x	46.190	=	0.00
40.0	0.00	x	46.190	=	0.00
41.0	0.00	x	46.190	=	0.00

***** Multiply Hydrograph by Constant *****

Unit .HYD File: h:\haestad\pondpack\SLUG.HYD
Output Hydrograph: b5973\LAKE1-25.HYD

Multiplier Constant: 46.19

TIME (min)	Unit Ordinates		Multiplier Constant		Output Hydrograph (cfs)
42.0	0.00	x	46.190	=	0.00
43.0	0.00	x	46.190	=	0.00
44.0	0.00	x	46.190	=	0.00
45.0	0.00	x	46.190	=	0.00
46.0	0.00	x	46.190	=	0.00
47.0	0.00	x	46.190	=	0.00
48.0	0.00	x	46.190	=	0.00
49.0	0.00	x	46.190	=	0.00
50.0	0.00	x	46.190	=	0.00
51.0	0.00	x	46.190	=	0.00
52.0	0.00	x	46.190	=	0.00
53.0	0.00	x	46.190	=	0.00
54.0	0.00	x	46.190	=	0.00
55.0	0.00	x	46.190	=	0.00
56.0	0.00	x	46.190	=	0.00
57.0	0.00	x	46.190	=	0.00
58.0	0.00	x	46.190	=	0.00
59.0	0.00	x	46.190	=	0.00
60.0	0.00	x	46.190	=	0.00

***** Multiply Hydrograph by Constant *****

Unit .HYD File: h:\haestad\pondpack\SLUG.HYD
Output Hydrograph: b5973\LAKE1-00.HYD

Multiplier Constant: 59.09

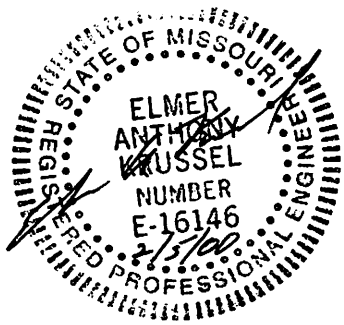
TIME (min)	Unit Ordinates		Multiplier Constant		Output Hydrograph (cfs)
0.0	1.00	x	59.090	=	59.09
1.0	1.00	x	59.090	=	59.09
2.0	1.00	x	59.090	=	59.09
3.0	1.00	x	59.090	=	59.09
4.0	1.00	x	59.090	=	59.09
5.0	1.00	x	59.090	=	59.09
6.0	1.00	x	59.090	=	59.09
7.0	1.00	x	59.090	=	59.09
8.0	1.00	x	59.090	=	59.09
9.0	1.00	x	59.090	=	59.09
10.0	1.00	x	59.090	=	59.09
11.0	1.00	x	59.090	=	59.09
12.0	1.00	x	59.090	=	59.09
13.0	1.00	x	59.090	=	59.09
14.0	1.00	x	59.090	=	59.09
15.0	1.00	x	59.090	=	59.09
16.0	1.00	x	59.090	=	59.09
17.0	1.00	x	59.090	=	59.09
18.0	1.00	x	59.090	=	59.09
19.0	1.00	x	59.090	=	59.09
20.0	1.00	x	59.090	=	59.09
21.0	1.00	x	59.090	=	59.09
22.0	1.00	x	59.090	=	59.09
23.0	1.00	x	59.090	=	59.09
24.0	1.00	x	59.090	=	59.09
25.0	1.00	x	59.090	=	59.09
26.0	1.00	x	59.090	=	59.09
27.0	1.00	x	59.090	=	59.09
28.0	1.00	x	59.090	=	59.09
29.0	1.00	x	59.090	=	59.09
30.0	0.00	x	59.090	=	0.00
31.0	0.00	x	59.090	=	0.00
32.0	0.00	x	59.090	=	0.00
33.0	0.00	x	59.090	=	0.00
34.0	0.00	x	59.090	=	0.00
35.0	0.00	x	59.090	=	0.00
36.0	0.00	x	59.090	=	0.00
37.0	0.00	x	59.090	=	0.00
38.0	0.00	x	59.090	=	0.00
39.0	0.00	x	59.090	=	0.00
40.0	0.00	x	59.090	=	0.00
41.0	0.00	x	59.090	=	0.00

***** Multiply Hydrograph by Constant *****

Unit .HYD File: h:\haestad\pondpack\SLUG.HYD
Output Hydrograph: b5973\LAKE1-00.HYD

Multiplier Constant: 59.09

TIME (min)	Unit Ordinates		Multiplier Constant		Output Hydrograph (cfs)
42.0	0.00	x	59.090	=	0.00
43.0	0.00	x	59.090	=	0.00
44.0	0.00	x	59.090	=	0.00
45.0	0.00	x	59.090	=	0.00
46.0	0.00	x	59.090	=	0.00
47.0	0.00	x	59.090	=	0.00
48.0	0.00	x	59.090	=	0.00
49.0	0.00	x	59.090	=	0.00
50.0	0.00	x	59.090	=	0.00
51.0	0.00	x	59.090	=	0.00
52.0	0.00	x	59.090	=	0.00
53.0	0.00	x	59.090	=	0.00
54.0	0.00	x	59.090	=	0.00
55.0	0.00	x	59.090	=	0.00
56.0	0.00	x	59.090	=	0.00
57.0	0.00	x	59.090	=	0.00
58.0	0.00	x	59.090	=	0.00
59.0	0.00	x	59.090	=	0.00
60.0	0.00	x	59.090	=	0.00



POND-2 Version: 5.21
S/N:

Walden Pond
Lake 1

CALCULATED 02-05-2000 09:38:59
DISK FILE: b5973\LAKE1 .VOL

Planimeter scale: 1 inch = 1 ft.

Elevation (ft)	Planimeter (sq.in.)	Area (sq.ft)	A1+A2+sqr(A1*A2) (sq.ft)	* Volume (cubic-ft)	Volume Sum (cubic-ft)
509.00	1.00	1	0	0	0
510.00	4,570.00	4,570	4,639	1,546	1,546
511.00	*I*	7,272	17,606	5,869	7,415
512.00	10,598.00	10,598	22,127	14,752	16,298
513.00	*I*	12,698	34,896	11,632	27,930
514.00	14,987.00	14,987	38,188	25,459	41,756
515.00	*I*	17,218	48,269	16,090	57,846
516.00	19,604.00	19,604	51,732	34,488	76,244
517.00	*I*	21,966	62,322	20,774	97,018
518.00	24,463.00	24,463	65,966	43,977	120,222
520.00	29,567.00	29,567	80,924	53,949	174,171

I ---> Interpolated area from closest two planimeter readings.

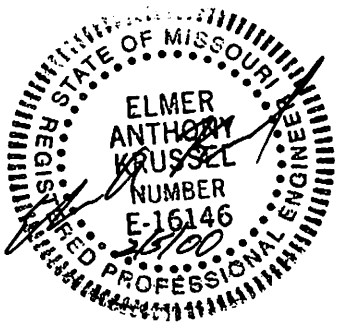
$$IA = (sq.rt(Area1) + ((Ei-E1)/(E2-E1))*(sq.rt(Area2)-sq.rt(Area1)))^2$$

where: E1, E2 = Closest two elevations with planimeter data
Ei = Elevation at which to interpolate area
Area1,Area2 = Areas computed for E1, E2, respectively
IA = Interpolated area for Ei

* Incremental volume computed by the Conic Method for Reservoir Volumes.

Volume = (1/3) * (EL2-EL1) * (Area1 + Area2 + sq.rt.(Area1*Area2))

where: EL1, EL2 = Lower and upper elevations of the increment
Area1,Area2 = Areas computed for EL1, EL2, respectively
Volume = Incremental volume between EL1 and EL2



Outlet Structure File: LAKE1 .STR

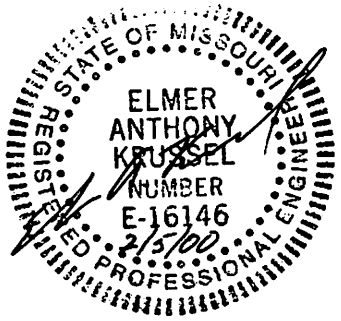
POND-2 Version: 5.21 S/N:
Date Executed: Time Executed:

****
Walden Pond
Lake 1

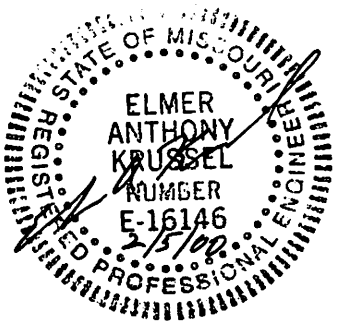
****

***** COMPOSITE OUTFLOW SUMMARY ****

Elevation (ft)	Q (cfs)	Contributing Structures
509.00	0.0	1
509.25	0.2	1
509.50	0.6	1
509.75	1.0	1
510.00	1.5	1
510.25	1.7	1
510.50	2.0	1
510.75	2.2	1
511.00	2.4	1
511.25	2.6	1
511.50	2.8	1
511.75	3.0	1
512.00	3.1	1
512.25	3.3	1
512.50	3.4	1
512.75	3.6	1
513.00	3.7	1
513.25	3.8	1
513.50	3.9	1
513.75	4.1	1
514.00	4.2	1
514.25	4.3	1
514.50	4.4	1
514.75	4.5	1
515.00	4.6	1
515.25	4.7	1
515.50	4.8	1
515.75	4.9	1
516.00	5.0	1
516.25	5.1	1
516.50	5.2	1
516.75	5.3	1
517.00	5.4	1 +2
517.25	11.5	1 +2
517.50	22.5	1 +2
517.75	36.8	1 +2
518.00	53.7	1 +2
518.25	69.7	1 +2
518.50	83.8	1 +2
518.75	97.9	1 +2



519.00 111.9 1 +2



Outlet Structure File: LAKE1 .STR

POND-2 Version: 5.21 S/N:
Date Executed: Time Executed:

****
Walden Pond
Lake 1

****

Outlet Structure File: b5973\LAKE1 .STR
Planimeter Input File: b5973\LAKE1 .VOL
Rating Table Output File: b5973\LAKE1 .PND

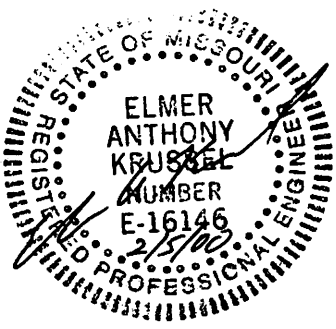
Min. Elev.(ft) = 509 Max. Elev.(ft) = 519 Incr.(ft) = .25

Additional elevations (ft) to be included in table:
* *

****
SYSTEM CONNECTIVITY
****

Structure	No.	Q Table		Q Table
CULVERT-CR	1		->	1
INLET BOX	2		->	2

Outflow rating table summary was stored in file:
b5973\LAKE1 .PND



Outlet Structure File: LAKE1 .STR

POND-2 Version: 5.21 S/N:
Date Executed: Time Executed:

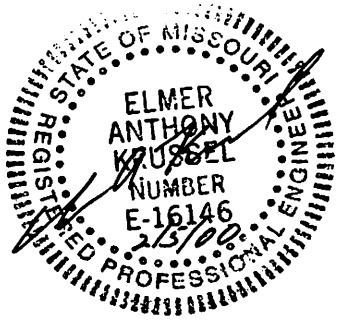
****
Walden Pond
Lake 1

****

>>>>>> Structure No. 1 <<<<<<
(Input Data)

CULVERT-CR
Circular Culvert (With Inlet Control)

E1 elev.(ft)?	509
E2 elev.(ft)?	519.001
Diam. (ft)?	0.66667
Inv. el.(ft)?	509
Slope (ft/ft)?	.01
T1 ratio?	
T2 ratio?	
K Coeff.?	.0045
M Coeff.?	2.0
c Coeff.?	.0317
Y Coeff.?	0.69
Form 1 or 2?	1
Slope factor?	-0.5



Outlet Structure File: LAKE1 .STR

POND-2 Version: 5.21 S/N:
Date Executed: Time Executed:

****
Walden Pond
Lake 1

****

>>>>>> Structure No. 2 <<<<<<
(Input Data)

INLET BOX
Weir & Orifice defined by length and area

E1 elev.(ft)? 517
E2 elev.(ft)? 519.001
Crest elev.(ft)? 517
Weir length (ft)? 16
Weir coefficient? 3
Orifice area (sq.ft)? 16
Orifice coefficient? .6
Start transition elev.(ft) @ ?
Transition height (ft)? 1

Outlet Structure File: LAKE1 .STR

POND-2 Version: 5.21 S/N:
Date Executed: Time Executed:

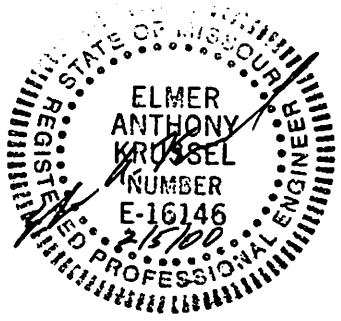
****
Walden Pond
Lake 1

****

Outflow Rating Table for Structure #1
CULVERT-CR Circular Culvert (With Inlet Control)

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
509.00	0.0	No headwater
509.25	0.2	Equ.1: HW =.25 dc=.19 Ac=.082
509.50	0.6	Equ.1: HW =.5 dc=.353 Ac=.188
509.75	1.0	Transition: HW =.750
510.00	1.5	Submerged: HW =1.0
510.25	1.7	Submerged: HW =1.25
510.50	2.0	Submerged: HW =1.5
510.75	2.2	Submerged: HW =1.75
511.00	2.4	Submerged: HW =2.0
511.25	2.6	Submerged: HW =2.25
511.50	2.8	Submerged: HW =2.5
511.75	3.0	Submerged: HW =2.75
512.00	3.1	Submerged: HW =3.0
512.25	3.3	Submerged: HW =3.25
512.50	3.4	Submerged: HW =3.5
512.75	3.6	Submerged: HW =3.75
513.00	3.7	Submerged: HW =4.0
513.25	3.8	Submerged: HW =4.25
513.50	3.9	Submerged: HW =4.5
513.75	4.1	Submerged: HW =4.75
514.00	4.2	Submerged: HW =5.0
514.25	4.3	Submerged: HW =5.25
514.50	4.4	Submerged: HW =5.5
514.75	4.5	Submerged: HW =5.75
515.00	4.6	Submerged: HW =6.0
515.25	4.7	Submerged: HW =6.25
515.50	4.8	Submerged: HW =6.5
515.75	4.9	Submerged: HW =6.75
516.00	5.0	Submerged: HW =7.0
516.25	5.1	Submerged: HW =7.25
516.50	5.2	Submerged: HW =7.5



Outlet Structure File: LAKE1 .STR

POND-2 Version: 5.21 S/N:
Date Executed: Time Executed:

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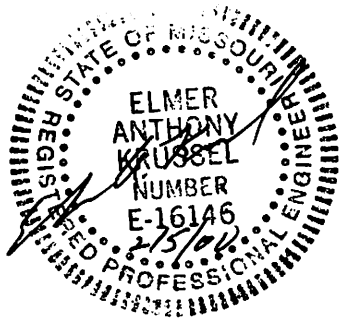
Outflow Rating Table for Structure #1
CULVERT-CR Circular Culvert (With Inlet Control)

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
516.75	5.3	Submerged: HW =7.75
517.00	5.4	Submerged: HW =8.0
517.25	5.5	Submerged: HW =8.25
517.50	5.6	Submerged: HW =8.5
517.75	5.6	Submerged: HW =8.75
518.00	5.7	Submerged: HW =9.0
518.25	5.8	Submerged: HW =9.25
518.50	5.9	Submerged: HW =9.5
518.75	6.0	Submerged: HW =9.75
519.00	6.1	Submerged: HW =10.0

Used Unsubmerged Equ. Form (1) for elev. less than 509.73 ft
Used Submerged Equation for elevations greater than 509.79 ft
HW=Headwater (ft) dc=Critical depth (ft) Ac=Area (sq.ft) at dc

Transition flows interpolated from the following values:
E1=509.73 ft; Q1=1.0 cfs; Dc=.48 ft; E2=509.79 ft; Q2=1.14 cfs



Outlet Structure File: LAKE1 .STR

POND-2 Version: 5.21 S/N:
Date Executed: Time Executed:

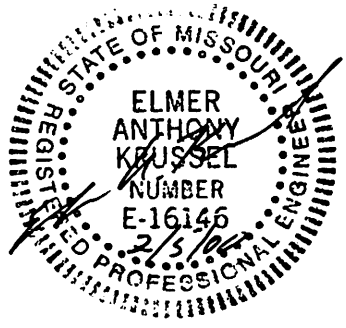
****
Walden Pond
Lake 1

****

Outflow Rating Table for Structure #2
INLET BOX Weir & Orifice defined by length and area

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
509.00	0.0	E < Inv.El.= 517
509.25	0.0	E < El= 517
509.50	0.0	E < El= 517
509.75	0.0	E < El= 517
510.00	0.0	E < El= 517
510.25	0.0	E < El= 517
510.50	0.0	E < El= 517
510.75	0.0	E < El= 517
511.00	0.0	E < El= 517
511.25	0.0	E < El= 517
511.50	0.0	E < El= 517
511.75	0.0	E < El= 517
512.00	0.0	E < El= 517
512.25	0.0	E < El= 517
512.50	0.0	E < El= 517
512.75	0.0	E < El= 517
513.00	0.0	E < El= 517
513.25	0.0	E < El= 517
513.50	0.0	E < El= 517
513.75	0.0	E < El= 517
514.00	0.0	E < El= 517
514.25	0.0	E < El= 517
514.50	0.0	E < El= 517
514.75	0.0	E < El= 517
515.00	0.0	E < El= 517
515.25	0.0	E < El= 517
515.50	0.0	E < El= 517
515.75	0.0	E < El= 517
516.00	0.0	E < El= 517
516.25	0.0	E < El= 517
516.50	0.0	E < El= 517
516.75	0.0	E < El= 517



Outlet Structure File: LAKE1 .STR

POND-2 Version: 5.21 S/N:
Date Executed: Time Executed:

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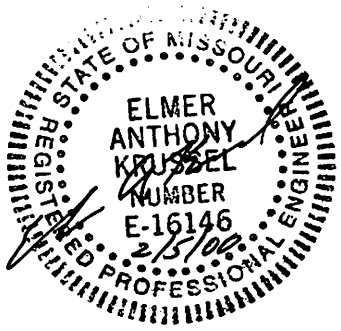
Outflow Rating Table for Structure #2
INLET BOX Weir & Orifice defined by length and area

***** INLET CONTROL ASSUMED *****

Elevation (ft)	Q (cfs)	Computation Messages
517.00	0.0	Weir: H =0.0
517.25	6.0	Weir: H =.25
517.50	17.0	Weir: H =.5
517.75	31.2	Weir: H =.750
518.00	48.0	Weir: H =1.0
518.25	63.9	Transition: H =1.25
518.50	77.9	Transition: H =1.5
518.75	91.9	Transition: H =1.75
519.00	105.9	Transition: H =2.0

Weir Cw = 3 Weir length = 16 ft
Orifice Co = .6 Orifice area = 16 sq.ft.
Q (cfs) = (Cw * L * H**1.5) or (Co * A * sqr(2*g*H))
Transition interpolated between elev. 518.105 and 519.105 ft
Weir equation = Orifice equation @ elev.= 518.605 ft



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*****************
*               *
* Walden Pond   *
*    Lake 1     *
*               *
*               *
*               *
*****************
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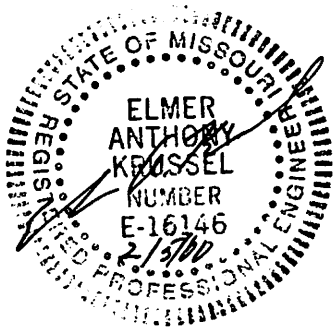


Inflow Hydrograph: b5973\LAKE1-2 .HYD
Rating Table file: b5973\LAKE1 .PND

----INITIAL CONDITIONS----
Elevation = 509.00 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
509.00	0.0	0
509.25	0.2	27
509.50	0.6	202
509.75	1.0	662
510.00	1.5	1,546
510.25	1.7	2,765
510.50	2.0	4,143
510.75	2.2	5,690
511.00	2.4	7,415
511.25	2.6	9,329
511.50	2.8	11,441
511.75	3.0	13,760
512.00	3.1	16,298
512.25	3.3	19,010
512.50	3.4	21,851
512.75	3.6	24,824
513.00	3.7	27,930
513.25	3.8	31,173
513.50	3.9	34,557
513.75	4.1	38,084
514.00	4.2	41,756
514.25	4.3	45,571
514.50	4.4	49,522
514.75	4.5	53,613
515.00	4.6	57,846
515.25	4.7	62,223
515.50	4.8	66,747
515.75	4.9	71,420
516.00	5.0	76,244
516.25	5.1	81,217
516.50	5.2	86,336

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	0.0
0.9	1.1
6.7	7.3
22.1	23.1
51.5	53.0
92.2	93.9
138.1	140.1
189.7	191.9
247.2	249.6
311.0	313.6
381.4	384.2
458.7	461.7
543.3	546.4
633.7	637.0
728.4	731.8
827.4	831.0
931.0	934.7
1039.1	1042.9
1151.9	1155.8
1269.5	1273.6
1391.9	1396.1
1519.0	1523.3
1650.7	1655.1
1787.1	1791.6
1928.2	1932.8
2074.1	2078.8
2224.9	2229.7
2380.7	2385.6
2541.5	2546.5
2707.2	2712.3
2877.9	2883.1

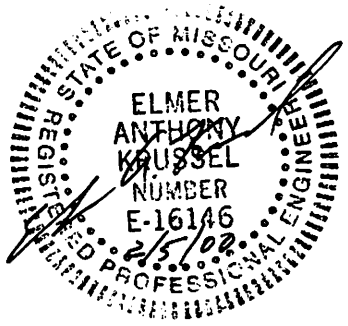
GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
516.75	5.3	91,602
517.00	5.4	97,018
517.25	11.5	102,586
517.50	22.5	108,308
517.75	36.8	114,186
518.00	53.7	120,222
518.25	69.7	126,414
518.50	83.8	132,760
518.75	97.9	139,261
519.00	111.9	145,920

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
3053.4	3058.7
3233.9	3239.3
3419.5	3431.0
3610.3	3632.8
3806.2	3843.0
4007.4	4061.1
4213.8	4283.5
4425.3	4509.1
4642.0	4739.9
4864.0	4975.9

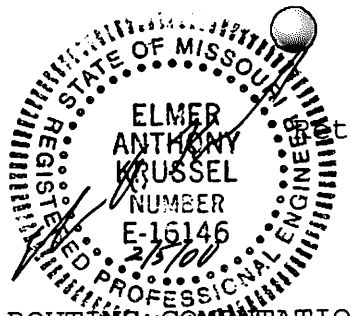
Time increment (t) = 1.0 min.



POND-2 Version: 5.21 S/N:
EXECUTED: 02-05-2000 09:41:55

Return Freq: 2 years

Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-2 .HYD
Outflow Hydrograph: b5973\LIOUT-2 .HYD



INFLOW HYDROGRAPH

ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	22.81	-----	0.0	0.0	0.00	509.00
1.0	22.81	45.6	42.9	45.6	1.38	509.94
2.0	22.81	45.6	85.1	88.5	1.67	510.22
3.0	22.81	45.6	126.9	130.8	1.94	510.45
4.0	22.81	45.6	168.3	172.5	2.13	510.66
5.0	22.81	45.6	209.3	213.9	2.28	510.85
6.0	22.81	45.6	250.1	254.9	2.42	511.02
7.0	22.81	45.6	290.6	295.7	2.54	511.18
8.0	22.81	45.6	330.9	336.3	2.66	511.33
9.0	22.81	45.6	371.0	376.5	2.78	511.47
10.0	22.81	45.6	410.8	416.6	2.88	511.60
11.0	22.81	45.6	450.5	456.5	2.99	511.73
12.0	22.81	45.6	490.0	496.1	3.04	511.85
13.0	22.81	45.6	529.5	535.6	3.09	511.97
14.0	22.81	45.6	568.8	575.1	3.16	512.08
15.0	22.81	45.6	607.9	614.4	3.25	512.19
16.0	22.81	45.6	646.9	653.5	3.32	512.29
17.0	22.81	45.6	685.8	692.5	3.36	512.40
18.0	22.81	45.6	724.6	731.4	3.40	512.50
19.0	22.81	45.6	763.3	770.2	3.48	512.60
20.0	22.81	45.6	801.8	808.9	3.56	512.69
21.0	22.81	45.6	840.2	847.4	3.62	512.79
22.0	22.81	45.6	878.5	885.8	3.65	512.88
23.0	22.81	45.6	916.7	924.1	3.69	512.97
24.0	22.81	45.6	954.9	962.3	3.73	513.06
25.0	22.81	45.6	993.0	1000.5	3.76	513.15
26.0	22.81	45.6	1031.0	1038.6	3.80	513.24
27.0	22.81	45.6	1069.0	1076.6	3.83	513.32
28.0	22.81	45.6	1106.9	1114.6	3.86	513.41
29.0	22.81	45.6	1144.7	1152.5	3.90	513.49
30.0	0.00	22.8	1159.7	1167.5	3.92	513.52
31.0	0.00	0.0	1151.8	1159.7	3.91	513.51
32.0	0.00	0.0	1144.1	1151.8	3.90	513.49
33.0	0.00	0.0	1136.3	1144.1	3.89	513.47
34.0	0.00	0.0	1128.5	1136.3	3.88	513.46
35.0	0.00	0.0	1120.8	1128.5	3.88	513.44
36.0	0.00	0.0	1113.0	1120.8	3.87	513.42
37.0	0.00	0.0	1105.3	1113.0	3.86	513.41
38.0	0.00	0.0	1097.6	1105.3	3.86	513.39
39.0	0.00	0.0	1089.9	1097.6	3.85	513.37
40.0	0.00	0.0	1082.2	1089.9	3.84	513.35
41.0	0.00	0.0	1074.5	1082.2	3.83	513.34
42.0	0.00	0.0	1066.9	1074.5	3.83	513.32
43.0	0.00	0.0	1059.2	1066.9	3.82	513.30
44.0	0.00	0.0	1051.6	1059.2	3.81	513.29

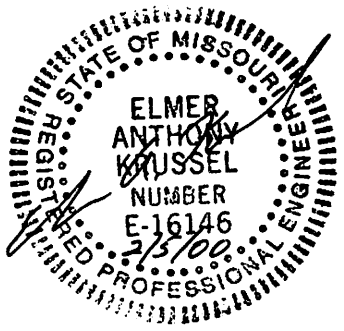
Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-2 .HYD
Outflow Hydrograph: b5973\LIOUT-2 .HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	0.00
46.0	0.00
47.0	0.00
48.0	0.00
49.0	0.00
50.0	0.00
51.0	0.00
52.0	0.00
53.0	0.00
54.0	0.00
55.0	0.00
56.0	0.00
57.0	0.00
58.0	0.00
59.0	0.00
60.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	1044.0	1051.6	3.81	513.27
0.0	1036.4	1044.0	3.80	513.25
0.0	1028.8	1036.4	3.79	513.23
0.0	1021.2	1028.8	3.79	513.22
0.0	1013.7	1021.2	3.78	513.20
0.0	1006.1	1013.7	3.77	513.18
0.0	998.6	1006.1	3.77	513.17
0.0	991.1	998.6	3.76	513.15
0.0	983.6	991.1	3.75	513.13
0.0	976.1	983.6	3.75	513.11
0.0	968.6	976.1	3.74	513.10
0.0	961.1	968.6	3.73	513.08
0.0	953.7	961.1	3.72	513.06
0.0	946.3	953.7	3.72	513.04
0.0	938.8	946.3	3.71	513.03
0.0	931.4	938.8	3.70	513.01



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

Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-2 .HYD
Outflow Hydrograph: b5973\LIOUT-2 .HYD

Starting Pond W.S. Elevation = 509.00 ft

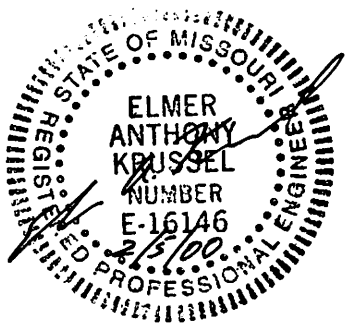
***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	22.81 cfs
Peak Outflow	=	3.92 cfs
Peak Elevation	=	513.52 ft

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

Initial Storage	=	0 cu-ft
Peak Storage From Storm	=	34,907 cu-ft
Total Storage in Pond	=	34,907 cu-ft

Warning: Inflow hydrograph truncated on left side.



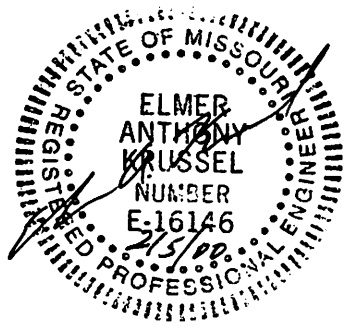
POND-2 Version: 5.21 S/N:

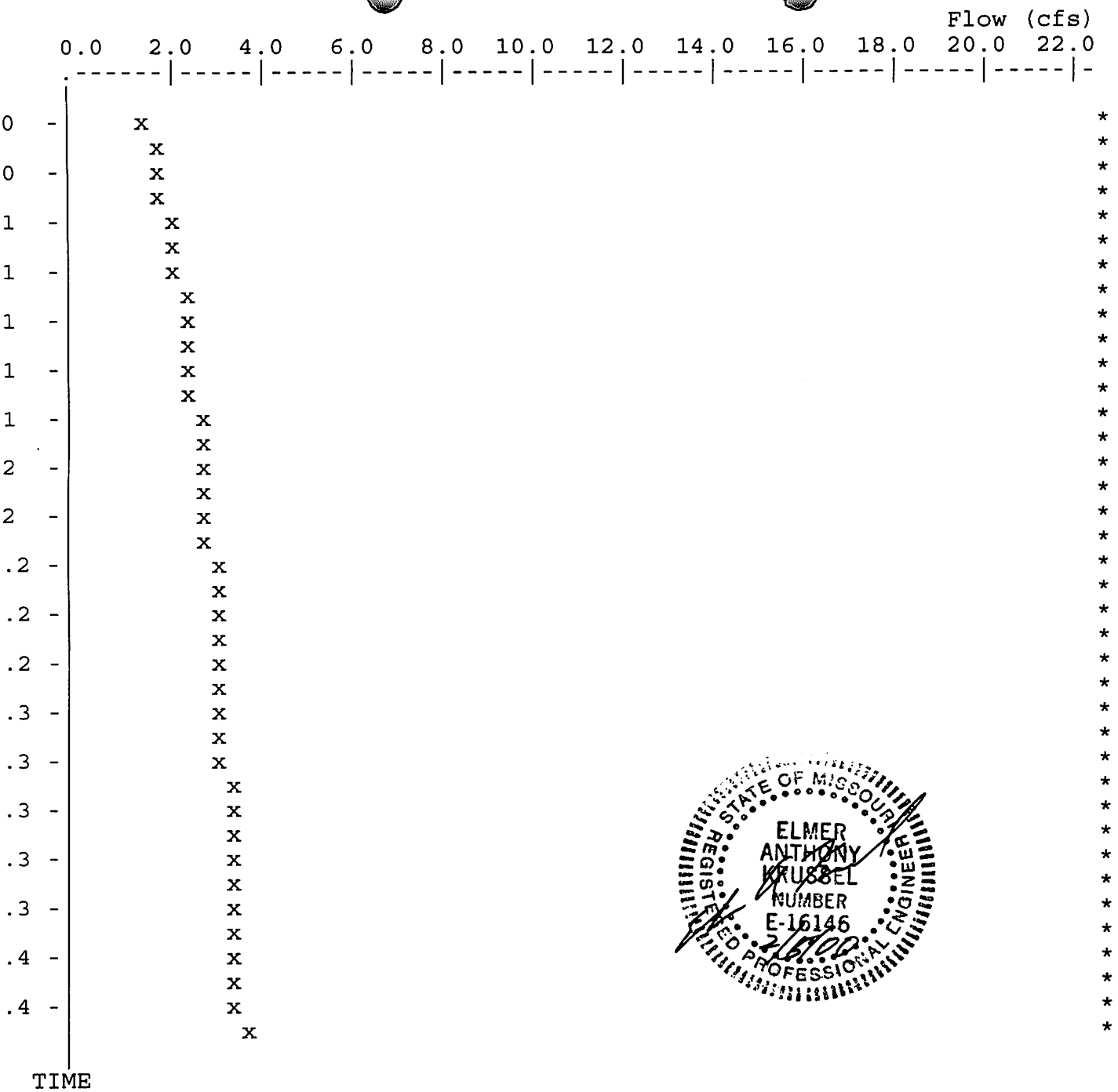
Return Freq: 2 years

Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-2 .HYD
Outflow Hydrograph: b5973\LIOUT-2 .HYD

EXECUTED: 02-05-2000
09:41:55

Peak Inflow = 22.81 cfs
Peak Outflow = 3.92 cfs
Peak Elevation = 513.52 ft





STATE OF MISSOURI
REGISTERED PROFESSIONAL ENGINEER
ELMER
ANTHONY
KRUSSEL
NUMBER
E-16146

x File: b5973\LIOUT-2 .HYD Qmax = 3.9 cfs
* File: b5973\LAKE1-2 .HYD Qmax = 22.8 cfs

****
*
* Walden Pond
* Lake 1
*
*
*
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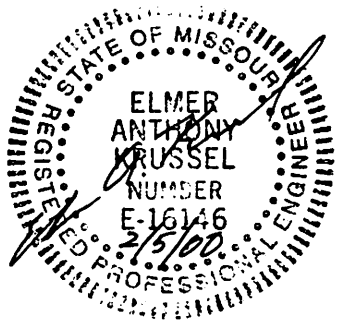


Inflow Hydrograph: b5973\LAKE1-15.HYD
Rating Table file: b5973\LAKE1 .PND

----INITIAL CONDITIONS----
Elevation = 509.00 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
509.00	0.0	0
509.25	0.2	27
509.50	0.6	202
509.75	1.0	662
510.00	1.5	1,546
510.25	1.7	2,765
510.50	2.0	4,143
510.75	2.2	5,690
511.00	2.4	7,415
511.25	2.6	9,329
511.50	2.8	11,441
511.75	3.0	13,760
512.00	3.1	16,298
512.25	3.3	19,010
512.50	3.4	21,851
512.75	3.6	24,824
513.00	3.7	27,930
513.25	3.8	31,173
513.50	3.9	34,557
513.75	4.1	38,084
514.00	4.2	41,756
514.25	4.3	45,571
514.50	4.4	49,522
514.75	4.5	53,613
515.00	4.6	57,846
515.25	4.7	62,223
515.50	4.8	66,747
515.75	4.9	71,420
516.00	5.0	76,244
516.25	5.1	81,217
516.50	5.2	86,336

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	0.0
0.9	1.1
6.7	7.3
22.1	23.1
51.5	53.0
92.2	93.9
138.1	140.1
189.7	191.9
247.2	249.6
311.0	313.6
381.4	384.2
458.7	461.7
543.3	546.4
633.7	637.0
728.4	731.8
827.4	831.0
931.0	934.7
1039.1	1042.9
1151.9	1155.8
1269.5	1273.6
1391.9	1396.1
1519.0	1523.3
1650.7	1655.1
1787.1	1791.6
1928.2	1932.8
2074.1	2078.8
2224.9	2229.7
2380.7	2385.6
2541.5	2546.5
2707.2	2712.3
2877.9	2883.1

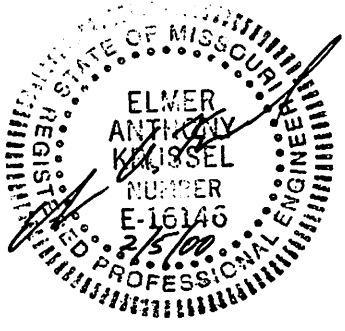
GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
516.75	5.3	91,602
517.00	5.4	97,018
517.25	11.5	102,586
517.50	22.5	108,308
517.75	36.8	114,186
518.00	53.7	120,222
518.25	69.7	126,414
518.50	83.8	132,760
518.75	97.9	139,261
519.00	111.9	145,920

INTERMEDIATE ROUTING COMPUTATIONS

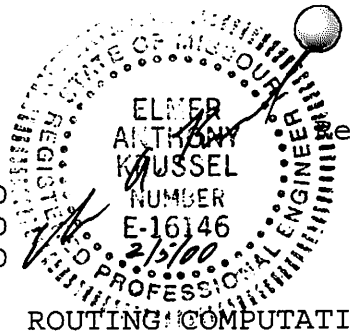
2S/t (cfs)	2S/t + 0 (cfs)
3053.4	3058.7
3233.9	3239.3
3419.5	3431.0
3610.3	3632.8
3806.2	3843.0
4007.4	4061.1
4213.8	4283.5
4425.3	4509.1
4642.0	4739.9
4864.0	4975.9

Time increment (t) = 1.0 min.



EXECUTED: 02-05-2000 09:41:55 Return Freq: 15 years

Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-15.HYD
Outflow Hydrograph: b5973\L1OUT-15.HYD



INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
0.0	37.41
1.0	37.41
2.0	37.41
3.0	37.41
4.0	37.41
5.0	37.41
6.0	37.41
7.0	37.41
8.0	37.41
9.0	37.41
10.0	37.41
11.0	37.41
12.0	37.41
13.0	37.41
14.0	37.41
15.0	37.41
16.0	37.41
17.0	37.41
18.0	37.41
19.0	37.41
20.0	37.41
21.0	37.41
22.0	37.41
23.0	37.41
24.0	37.41
25.0	37.41
26.0	37.41
27.0	37.41
28.0	37.41
29.0	37.41
30.0	0.00
31.0	0.00
32.0	0.00
33.0	0.00
34.0	0.00
35.0	0.00
36.0	0.00
37.0	0.00
38.0	0.00
39.0	0.00
40.0	0.00
41.0	0.00
42.0	0.00
43.0	0.00
44.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
-----	0.0	0.0	0.00	509.00
74.8	71.6	74.8	1.61	510.13
74.8	142.4	146.4	2.02	510.53
74.8	212.6	217.2	2.29	510.86
74.8	282.4	287.4	2.52	511.15
74.8	351.8	357.2	2.72	511.40
74.8	420.8	426.6	2.91	511.64
74.8	489.5	495.6	3.04	511.85
74.8	558.1	564.3	3.14	512.05
74.8	626.3	632.9	3.29	512.24
74.8	694.4	701.1	3.37	512.42
74.8	762.3	769.2	3.48	512.59
74.8	829.9	837.1	3.61	512.76
74.8	897.3	904.7	3.67	512.93
74.8	964.7	972.2	3.73	513.09
74.8	1031.9	1039.5	3.80	513.24
74.8	1099.0	1106.7	3.86	513.39
74.8	1166.0	1173.8	3.93	513.54
74.8	1232.7	1240.8	4.04	513.68
74.8	1299.3	1307.5	4.13	513.82
74.8	1365.7	1374.1	4.18	513.96
74.8	1432.1	1440.6	4.23	514.09
74.8	1498.3	1506.9	4.29	514.22
74.8	1564.5	1573.1	4.34	514.34
74.8	1630.5	1639.3	4.39	514.47
74.8	1696.5	1705.3	4.44	514.59
74.8	1762.3	1771.3	4.49	514.71
74.8	1828.1	1837.1	4.53	514.83
74.8	1893.7	1902.9	4.58	514.95
74.8	1959.3	1968.6	4.62	515.06
37.4	1987.4	1996.7	4.64	515.11
0.0	1978.1	1987.4	4.64	515.09
0.0	1968.9	1978.1	4.63	515.08
0.0	1959.6	1968.9	4.62	515.06
0.0	1950.4	1959.6	4.62	515.05
0.0	1941.2	1950.4	4.61	515.03
0.0	1932.0	1941.2	4.61	515.01
0.0	1922.8	1932.0	4.60	515.00
0.0	1913.6	1922.8	4.59	514.98
0.0	1904.4	1913.6	4.59	514.97
0.0	1895.2	1904.4	4.58	514.95
0.0	1886.1	1895.2	4.57	514.93
0.0	1877.0	1886.1	4.57	514.92
0.0	1867.8	1877.0	4.56	514.90
0.0	1858.7	1867.8	4.55	514.88

Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-15.HYD
Outflow Hydrograph: b5973\L1OUT-15.HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	0.00
46.0	0.00
47.0	0.00
48.0	0.00
49.0	0.00
50.0	0.00
51.0	0.00
52.0	0.00
53.0	0.00
54.0	0.00
55.0	0.00
56.0	0.00
57.0	0.00
58.0	0.00
59.0	0.00
60.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	1849.6	1858.7	4.55	514.87
0.0	1840.6	1849.6	4.54	514.85
0.0	1831.5	1840.6	4.53	514.84
0.0	1822.4	1831.5	4.53	514.82
0.0	1813.4	1822.4	4.52	514.80
0.0	1804.4	1813.4	4.52	514.79
0.0	1795.3	1804.4	4.51	514.77
0.0	1786.3	1795.3	4.50	514.76
0.0	1777.3	1786.3	4.50	514.74
0.0	1768.4	1777.3	4.49	514.72
0.0	1759.4	1768.4	4.48	514.71
0.0	1750.4	1759.4	4.48	514.69
0.0	1741.5	1750.4	4.47	514.67
0.0	1732.6	1741.5	4.46	514.66
0.0	1723.7	1732.6	4.46	514.64
0.0	1714.8	1723.7	4.45	514.63

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

Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-15.HYD
Outflow Hydrograph: b5973\L1OUT-15.HYD

Starting Pond W.S. Elevation = 509.00 ft

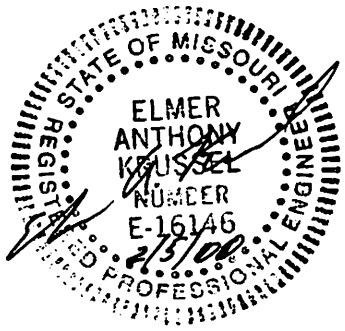
***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	37.41 cfs
Peak Outflow	=	4.64 cfs
Peak Elevation	=	515.11 ft

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

Initial Storage	=	0 cu-ft
Peak Storage From Storm	=	59,762 cu-ft
Total Storage in Pond	=	59,762 cu-ft

Warning: Inflow hydrograph truncated on left side.



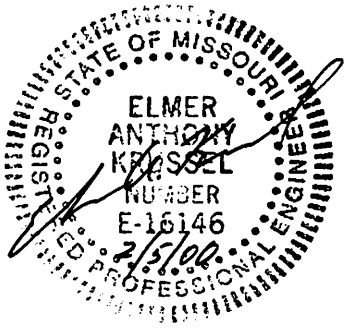
POND-2 Version: 5.21 S/N:

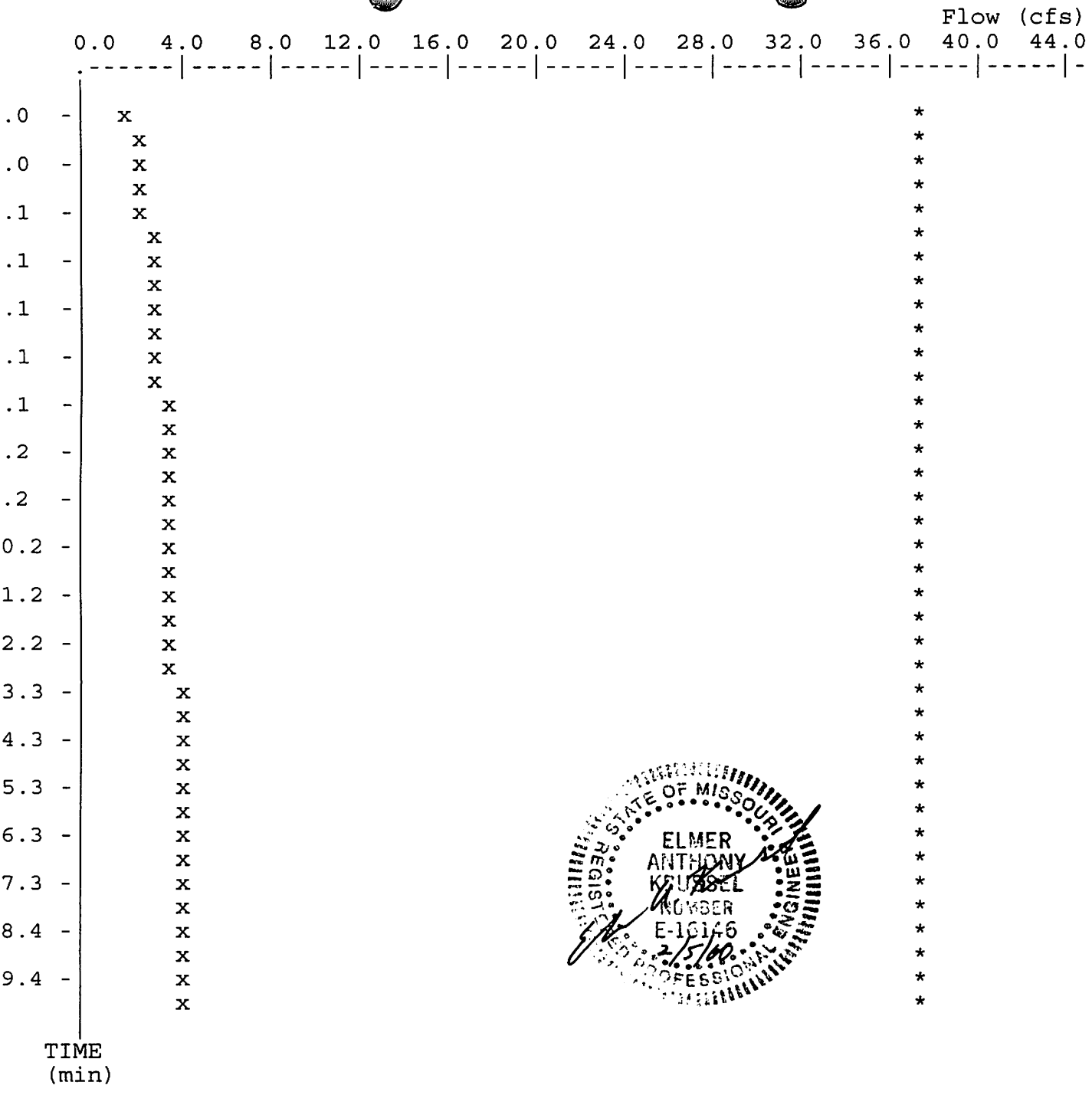
Return Freq: 15 years

Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-15.HYD
Outflow Hydrograph: b5973\L1OUT-15.HYD

EXECUTED: 02-05-2000
09:41:55

Peak Inflow = 37.41 cfs
Peak Outflow = 4.64 cfs
Peak Elevation = 515.11 ft





x File: b5973\L1OUT-15.HYD Qmax = 4.6 cfs
* File: b5973\LAKE1-15.HYD Qmax = 37.4 cfs

****
* *
* Walden Pond *
* Lake 1 *
* *
* *
* *
****

Inflow Hydrograph: b5973\LAKE1-25.HYD
Rating Table file: b5973\LAKE1 .PND

----INITIAL CONDITIONS----
Elevation = 509.00 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
509.00	0.0	0
509.25	0.2	27
509.50	0.6	202
509.75	1.0	662
510.00	1.5	1,546
510.25	1.7	2,765
510.50	2.0	4,143
510.75	2.2	5,690
511.00	2.4	7,415
511.25	2.6	9,329
511.50	2.8	11,441
511.75	3.0	13,760
512.00	3.1	16,298
512.25	3.3	19,010
512.50	3.4	21,851
512.75	3.6	24,824
513.00	3.7	27,930
513.25	3.8	31,173
513.50	3.9	34,557
513.75	4.1	38,084
514.00	4.2	41,756
514.25	4.3	45,571
514.50	4.4	49,522
514.75	4.5	53,613
515.00	4.6	57,846
515.25	4.7	62,223
515.50	4.8	66,747
515.75	4.9	71,420
516.00	5.0	76,244
516.25	5.1	81,217
516.50	5.2	86,336

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
0.0	0.0
0.9	1.1
6.7	7.3
22.1	23.1
51.5	53.0
92.2	93.9
138.1	140.1
189.7	191.9
247.2	249.6
311.0	313.6
381.4	384.2
458.7	461.7
543.3	546.4
633.7	637.0
728.4	731.8
827.4	831.0
931.0	934.7
1039.1	1042.9
1151.9	1155.8
1269.5	1273.6
1391.9	1396.1
1519.0	1523.3
1650.7	1655.1
1787.1	1791.6
1928.2	1932.8
2074.1	2078.8
2224.9	2229.7
2380.7	2385.6
2541.5	2546.5
2707.2	2712.3
2877.9	2883.1

GIVEN POND DATA

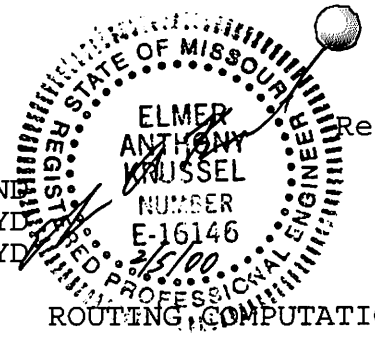
ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
516.75	5.3	91,602
517.00	5.4	97,018
517.25	11.5	102,586
517.50	22.5	108,308
517.75	36.8	114,186
518.00	53.7	120,222
518.25	69.7	126,414
518.50	83.8	132,760
518.75	97.9	139,261
519.00	111.9	145,920

INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
3053.4	3058.7
3233.9	3239.3
3419.5	3431.0
3610.3	3632.8
3806.2	3843.0
4007.4	4061.1
4213.8	4283.5
4425.3	4509.1
4642.0	4739.9
4864.0	4975.9

Time increment (t) = 1.0 min.

Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-25.HYD
Outflow Hydrograph: b5973\L1OUT-25.HYD



INFLOW HYDROGRAPH		ROUTING COMPUTATIONS				
TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	46.19	-----	0.0	0.0	0.00	509.00
1.0	46.19	92.4	89.0	92.4	1.69	510.24
2.0	46.19	92.4	177.1	181.4	2.16	510.70
3.0	46.19	92.4	264.5	269.4	2.46	511.08
4.0	46.19	92.4	351.4	356.9	2.72	511.40
5.0	46.19	92.4	437.9	443.8	2.95	511.69
6.0	46.19	92.4	524.1	530.3	3.08	511.95
7.0	46.19	92.4	610.0	616.5	3.25	512.19
8.0	46.19	92.4	695.6	702.4	3.37	512.42
9.0	46.19	92.4	781.0	788.0	3.51	512.64
10.0	46.19	92.4	866.1	873.4	3.64	512.85
11.0	46.19	92.4	951.0	958.5	3.72	513.05
12.0	46.19	92.4	1035.8	1043.4	3.80	513.25
13.0	46.19	92.4	1120.4	1128.2	3.88	513.44
14.0	46.19	92.4	1204.8	1212.8	4.00	513.62
15.0	46.19	92.4	1289.0	1297.2	4.12	513.80
16.0	46.19	92.4	1373.0	1381.4	4.19	513.97
17.0	46.19	92.4	1456.8	1465.4	4.25	514.14
18.0	46.19	92.4	1540.6	1549.2	4.32	514.30
19.0	46.19	92.4	1624.2	1633.0	4.38	514.46
20.0	46.19	92.4	1707.7	1716.6	4.45	514.61
21.0	46.19	92.4	1791.1	1800.1	4.51	514.76
22.0	46.19	92.4	1874.3	1883.4	4.57	514.91
23.0	46.19	92.4	1957.4	1966.7	4.62	515.06
24.0	46.19	92.4	2040.5	2049.8	4.68	515.20
25.0	46.19	92.4	2123.4	2132.8	4.74	515.34
26.0	46.19	92.4	2206.2	2215.8	4.79	515.48
27.0	46.19	92.4	2288.9	2298.5	4.84	515.61
28.0	46.19	92.4	2371.4	2381.2	4.90	515.74
29.0	46.19	92.4	2453.9	2463.8	4.95	515.87
30.0	0.00	46.2	2490.2	2500.1	4.97	515.93
31.0	0.00	0.0	2480.2	2490.2	4.97	515.91
32.0	0.00	0.0	2470.3	2480.2	4.96	515.90
33.0	0.00	0.0	2460.4	2470.3	4.95	515.88
34.0	0.00	0.0	2450.5	2460.4	4.95	515.87
35.0	0.00	0.0	2440.6	2450.5	4.94	515.85
36.0	0.00	0.0	2430.8	2440.6	4.93	515.84
37.0	0.00	0.0	2420.9	2430.8	4.93	515.82
38.0	0.00	0.0	2411.1	2420.9	4.92	515.80
39.0	0.00	0.0	2401.2	2411.1	4.92	515.79
40.0	0.00	0.0	2391.4	2401.2	4.91	515.77
41.0	0.00	0.0	2381.6	2391.4	4.90	515.76
42.0	0.00	0.0	2371.8	2381.6	4.90	515.74
43.0	0.00	0.0	2362.0	2371.8	4.89	515.73
44.0	0.00	0.0	2352.3	2362.0	4.88	515.71

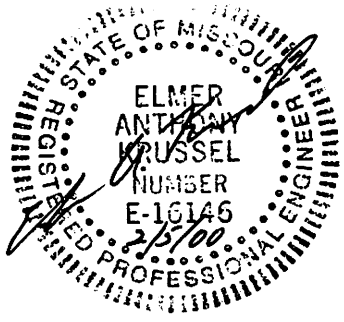
Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-25.HYD
Outflow Hydrograph: b5973\L1OUT-25.HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	0.00
46.0	0.00
47.0	0.00
48.0	0.00
49.0	0.00
50.0	0.00
51.0	0.00
52.0	0.00
53.0	0.00
54.0	0.00
55.0	0.00
56.0	0.00
57.0	0.00
58.0	0.00
59.0	0.00
60.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	2342.5	2352.3	4.88	515.70
0.0	2332.8	2342.5	4.87	515.68
0.0	2323.0	2332.8	4.87	515.67
0.0	2313.3	2323.0	4.86	515.65
0.0	2303.6	2313.3	4.85	515.63
0.0	2293.9	2303.6	4.85	515.62
0.0	2284.2	2293.9	4.84	515.60
0.0	2274.6	2284.2	4.83	515.59
0.0	2264.9	2274.6	4.83	515.57
0.0	2255.3	2264.9	4.82	515.56
0.0	2245.6	2255.3	4.82	515.54
0.0	2236.0	2245.6	4.81	515.53
0.0	2226.4	2236.0	4.80	515.51
0.0	2216.8	2226.4	4.80	515.49
0.0	2207.2	2216.8	4.79	515.48
0.0	2197.7	2207.2	4.79	515.46



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

Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-25.HYD
Outflow Hydrograph: b5973\L1OUT-25.HYD

Starting Pond W.S. Elevation = 509.00 ft

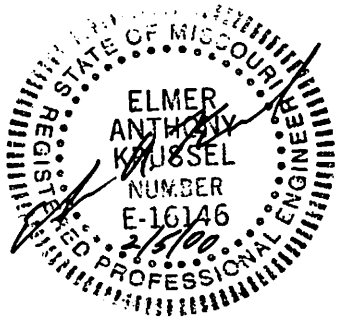
***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	46.19 cfs
Peak Outflow	=	4.97 cfs
Peak Elevation	=	515.93 ft

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

Initial Storage	=	0 cu-ft
Peak Storage From Storm	=	74,854 cu-ft
Total Storage in Pond	=	74,854 cu-ft

Warning: Inflow hydrograph truncated on left side.



POND-2 Version: 5.21 S/N:

Return Freq: 25 years

Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-25.HYD
Outflow Hydrograph: b5973\L1OUT-25.HYD

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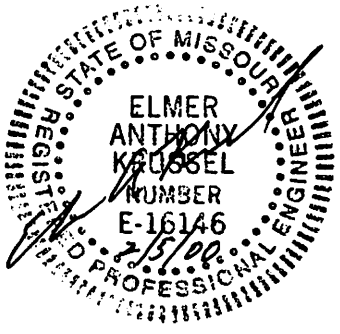
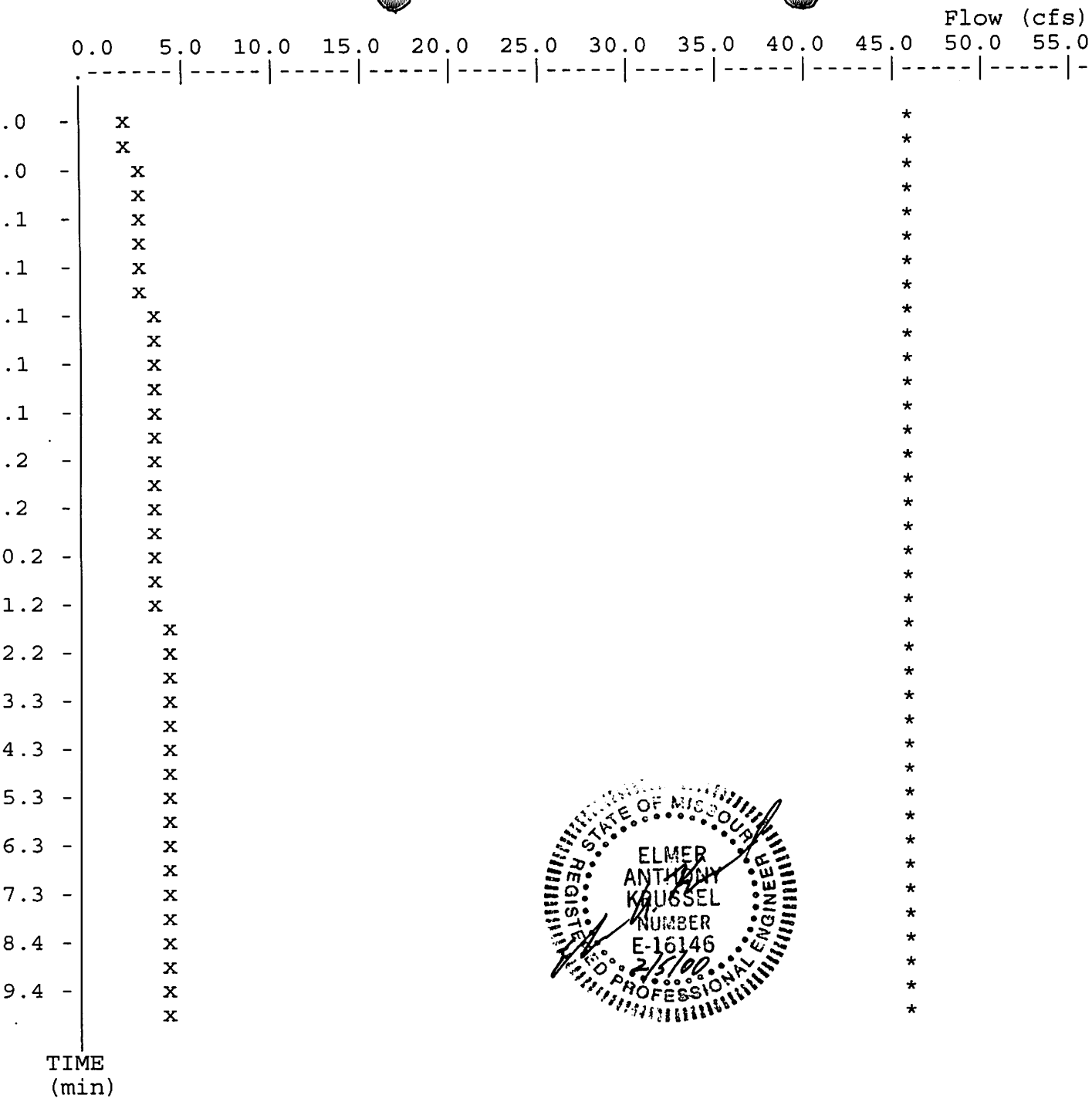
Peak Inflow = 46.19 cfs
Peak Outflow = 4.97 cfs
Peak Elevation = 515.93 ft





STATE OF MISSOURI
ELMER
ANTHONY
KRUSSEL
NUMBER
E-16146
2/5/00
REGISTERED PROFESSIONAL ENGINEER

x File: b5973\L1OUT-25.HYD Qmax = 5.0 cfs
* File: b5973\LAKE1-25.HYD Qmax = 46.2 cfs

```
*****************
*               *
* Walden Pond   *
*    Lake 1     *
*               *
*               *
*               *
*****************
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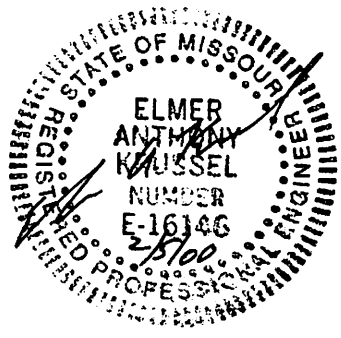


Inflow Hydrograph: b5973\LAKE1-00.HYD
Rating Table file: b5973\LAKE1 .PND

----INITIAL CONDITIONS----
Elevation = 509.00 ft
Outflow = 0.00 cfs
Storage = 0 cu-ft

GIVEN POND DATA

INTERMEDIATE ROUTING COMPUTATIONS

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)	2S/t (cfs)	2S/t + 0 (cfs)
509.00	0.0	0	0.0	0.0
509.25	0.2	27	0.9	1.1
509.50	0.6	202	6.7	7.3
509.75	1.0	662	22.1	23.1
510.00	1.5	1,546	51.5	53.0
510.25	1.7	2,765	92.2	93.9
510.50	2.0	4,143	138.1	140.1
510.75	2.2	5,690	189.7	191.9
511.00	2.4	7,415	247.2	249.6
511.25	2.6	9,329	311.0	313.6
511.50	2.8	11,441	381.4	384.2
511.75	3.0	13,760	458.7	461.7
512.00	3.1	16,298	543.3	546.4
512.25	3.3	19,010	633.7	637.0
512.50	3.4	21,851	728.4	731.8
512.75	3.6	24,824	827.4	831.0
513.00	3.7	27,930	931.0	934.7
513.25	3.8	31,173	1039.1	1042.9
513.50	3.9	34,557	1151.9	1155.8
513.75	4.1	38,084	1269.5	1273.6
514.00	4.2	41,756	1391.9	1396.1
514.25	4.3	45,571	1519.0	1523.3
514.50	4.4	49,522	1650.7	1655.1
514.75	4.5	53,613	1787.1	1791.6
515.00	4.6	57,846	1928.2	1932.8
515.25	4.7	62,223	2074.1	2078.8
515.50	4.8	66,747	2224.9	2229.7
515.75	4.9	71,420	2380.7	2385.6
516.00	5.0	76,244	2541.5	2546.5
516.25	5.1	81,217	2707.2	2712.3
516.50	5.2	86,336	2877.9	2883.1

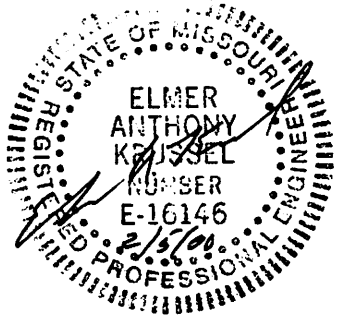
GIVEN POND DATA

ELEVATION (ft)	OUTFLOW (cfs)	STORAGE (cu-ft)
516.75	5.3	91,602
517.00	5.4	97,018
517.25	11.5	102,586
517.50	22.5	108,308
517.75	36.8	114,186
518.00	53.7	120,222
518.25	69.7	126,414
518.50	83.8	132,760
518.75	97.9	139,261
519.00	111.9	145,920

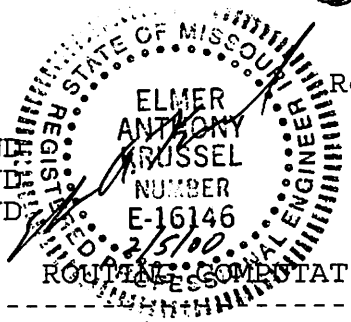
INTERMEDIATE ROUTING COMPUTATIONS

2S/t (cfs)	2S/t + 0 (cfs)
3053.4	3058.7
3233.9	3239.3
3419.5	3431.0
3610.3	3632.8
3806.2	3843.0
4007.4	4061.1
4213.8	4283.5
4425.3	4509.1
4642.0	4739.9
4864.0	4975.9

Time increment (t) = 1.0 min.



Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-00.HYD
Outflow Hydrograph: b5973\L1OUT-00.HYD



INFLOW HYDROGRAPH — ROUTING COMPUTATIONS

TIME (min)	INFLOW (cfs)	I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	59.09	-----	0.0	0.0	0.00	509.00
1.0	59.09	118.2	114.5	118.2	1.86	510.38
2.0	59.09	118.2	228.0	232.6	2.34	510.93
3.0	59.09	118.2	340.8	346.1	2.69	511.37
4.0	59.09	118.2	453.0	458.9	2.99	511.74
5.0	59.09	118.2	564.8	571.1	3.15	512.07
6.0	59.09	118.2	676.3	683.0	3.35	512.37
7.0	59.09	118.2	787.4	794.5	3.53	512.66
8.0	59.09	118.2	898.3	905.6	3.67	512.93
9.0	59.09	118.2	1008.9	1016.4	3.78	513.19
10.0	59.09	118.2	1119.3	1127.1	3.87	513.44
11.0	59.09	118.2	1229.4	1237.5	4.04	513.67
12.0	59.09	118.2	1339.3	1347.6	4.16	513.90
13.0	59.09	118.2	1449.0	1457.5	4.25	514.12
14.0	59.09	118.2	1558.5	1567.2	4.33	514.33
15.0	59.09	118.2	1667.8	1676.7	4.42	514.54
16.0	59.09	118.2	1777.0	1786.0	4.50	514.74
17.0	59.09	118.2	1886.1	1895.2	4.57	514.93
18.0	59.09	118.2	1994.9	2004.2	4.65	515.12
19.0	59.09	118.2	2103.7	2113.1	4.72	515.31
20.0	59.09	118.2	2212.3	2221.9	4.79	515.49
21.0	59.09	118.2	2320.7	2330.4	4.86	515.66
22.0	59.09	118.2	2429.0	2438.9	4.93	515.83
23.0	59.09	118.2	2537.2	2547.2	5.00	516.00
24.0	59.09	118.2	2645.3	2655.4	5.07	516.16
25.0	59.09	118.2	2753.2	2763.4	5.13	516.32
26.0	59.09	118.2	2861.0	2871.4	5.19	516.48
27.0	59.09	118.2	2968.6	2979.1	5.25	516.64
28.0	59.09	118.2	3076.2	3086.8	5.32	516.79
29.0	59.09	118.2	3183.6	3194.4	5.38	516.94
30.0	0.00	59.1	3231.7	3242.7	5.51	517.00
31.0	0.00	0.0	3220.9	3231.7	5.40	516.99
32.0	0.00	0.0	3210.1	3220.9	5.39	516.97
33.0	0.00	0.0	3199.4	3210.1	5.38	516.96
34.0	0.00	0.0	3188.6	3199.4	5.38	516.94
35.0	0.00	0.0	3177.9	3188.6	5.37	516.93
36.0	0.00	0.0	3167.1	3177.9	5.37	516.91
37.0	0.00	0.0	3156.4	3167.1	5.36	516.90
38.0	0.00	0.0	3145.7	3156.4	5.35	516.89
39.0	0.00	0.0	3135.0	3145.7	5.35	516.87
40.0	0.00	0.0	3124.3	3135.0	5.34	516.86
41.0	0.00	0.0	3113.6	3124.3	5.34	516.84
42.0	0.00	0.0	3103.0	3113.6	5.33	516.83
43.0	0.00	0.0	3092.3	3103.0	5.32	516.81
44.0	0.00	0.0	3081.7	3092.3	5.32	516.80

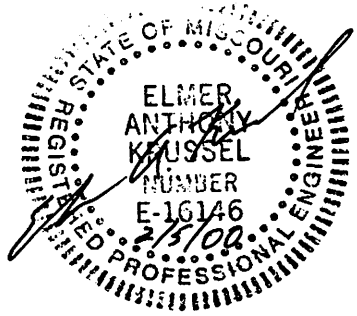
Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-00.HYD
Outflow Hydrograph: b5973\L1OUT-00.HYD

INFLOW HYDROGRAPH

TIME (min)	INFLOW (cfs)
45.0	0.00
46.0	0.00
47.0	0.00
48.0	0.00
49.0	0.00
50.0	0.00
51.0	0.00
52.0	0.00
53.0	0.00
54.0	0.00
55.0	0.00
56.0	0.00
57.0	0.00
58.0	0.00
59.0	0.00
60.0	0.00

ROUTING COMPUTATIONS

I1+I2 (cfs)	2S/t - O (cfs)	2S/t + O (cfs)	OUTFLOW (cfs)	ELEVATION (ft)
0.0	3071.1	3081.7	5.31	516.78
0.0	3060.5	3071.1	5.31	516.77
0.0	3049.9	3060.5	5.30	516.75
0.0	3039.3	3049.9	5.29	516.74
0.0	3028.7	3039.3	5.29	516.72
0.0	3018.1	3028.7	5.28	516.71
0.0	3007.6	3018.1	5.28	516.69
0.0	2997.0	3007.6	5.27	516.68
0.0	2986.5	2997.0	5.26	516.66
0.0	2976.0	2986.5	5.26	516.65
0.0	2965.5	2976.0	5.25	516.63
0.0	2955.0	2965.5	5.25	516.62
0.0	2944.5	2955.0	5.24	516.60
0.0	2934.0	2944.5	5.23	516.59
0.0	2923.6	2934.0	5.23	516.57
0.0	2913.1	2923.6	5.22	516.56



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

Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-00.HYD
Outflow Hydrograph: b5973\L1OUT-00.HYD

Starting Pond W.S. Elevation = 509.00 ft

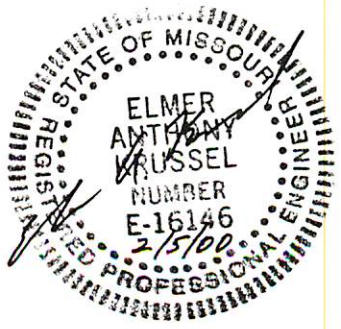
***** Summary of Peak Outflow and Peak Elevation *****

Peak Inflow	=	59.09 cfs
Peak Outflow	=	5.51 cfs
Peak Elevation	=	517.00 ft

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

Initial Storage	=	0 cu-ft
Peak Storage From Storm	=	97,116 cu-ft
Total Storage in Pond	=	97,116 cu-ft

Warning: Inflow hydrograph truncated on left side.



POND-2 Version: 5.21 S/N:

Return Freq: 100 years

Pond File: b5973\LAKE1 .PND
Inflow Hydrograph: b5973\LAKE1-00.HYD
Outflow Hydrograph: b5973\L1OUT-00.HYD

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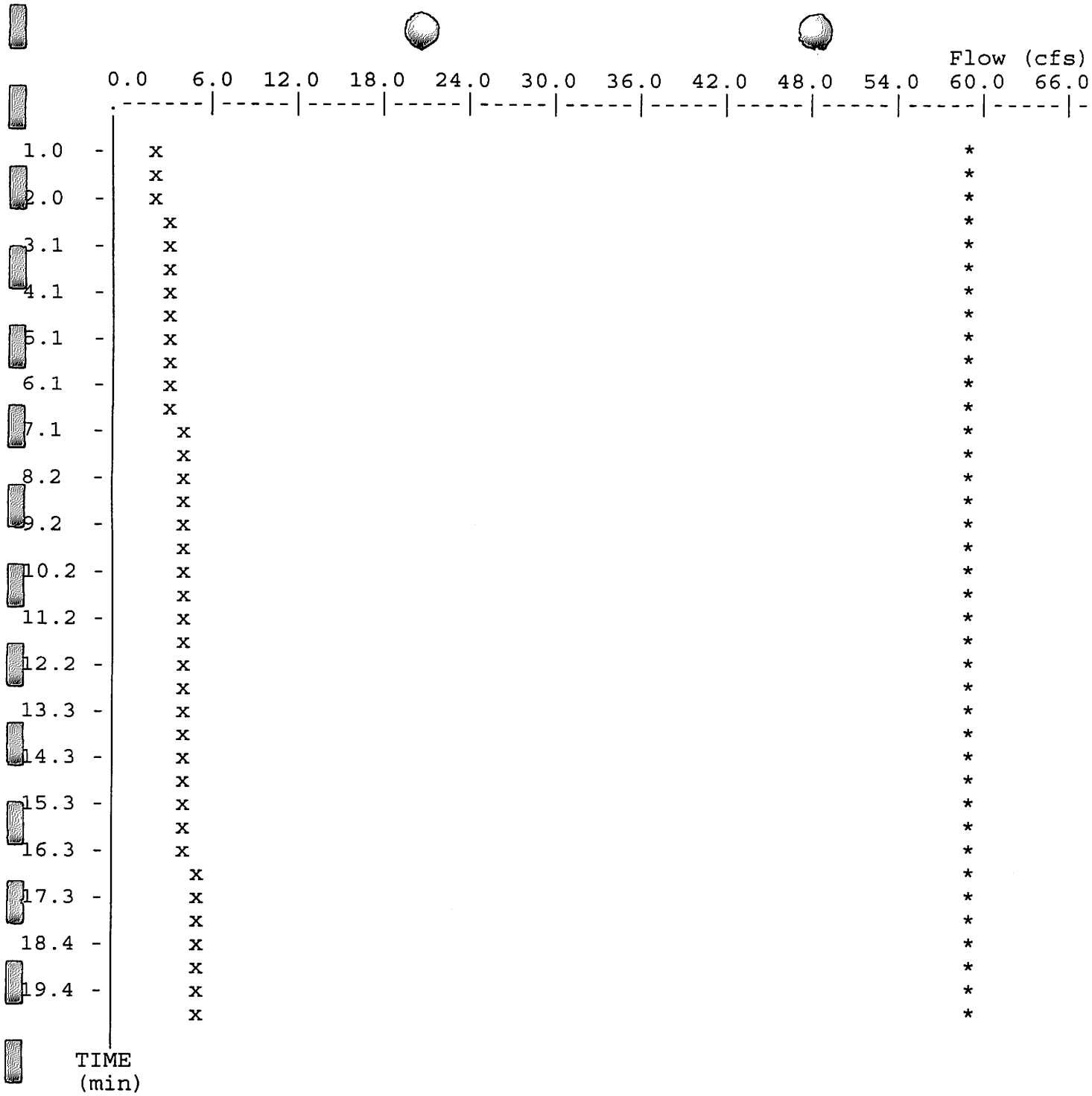
Peak Inflow = 59.09 cfs
Peak Outflow = 5.51 cfs
Peak Elevation = 517.00 ft



x File: b5973\L1OUT-00.HYD Qmax = 5.5 cfs
* File: b5973\LAKE1-00.HYD Qmax = 59.1 cfs