PRELIMINARY REPORT

ON

SANGCHRIS LAKE

CHRISTIAN COUNTY

ILLINOIS

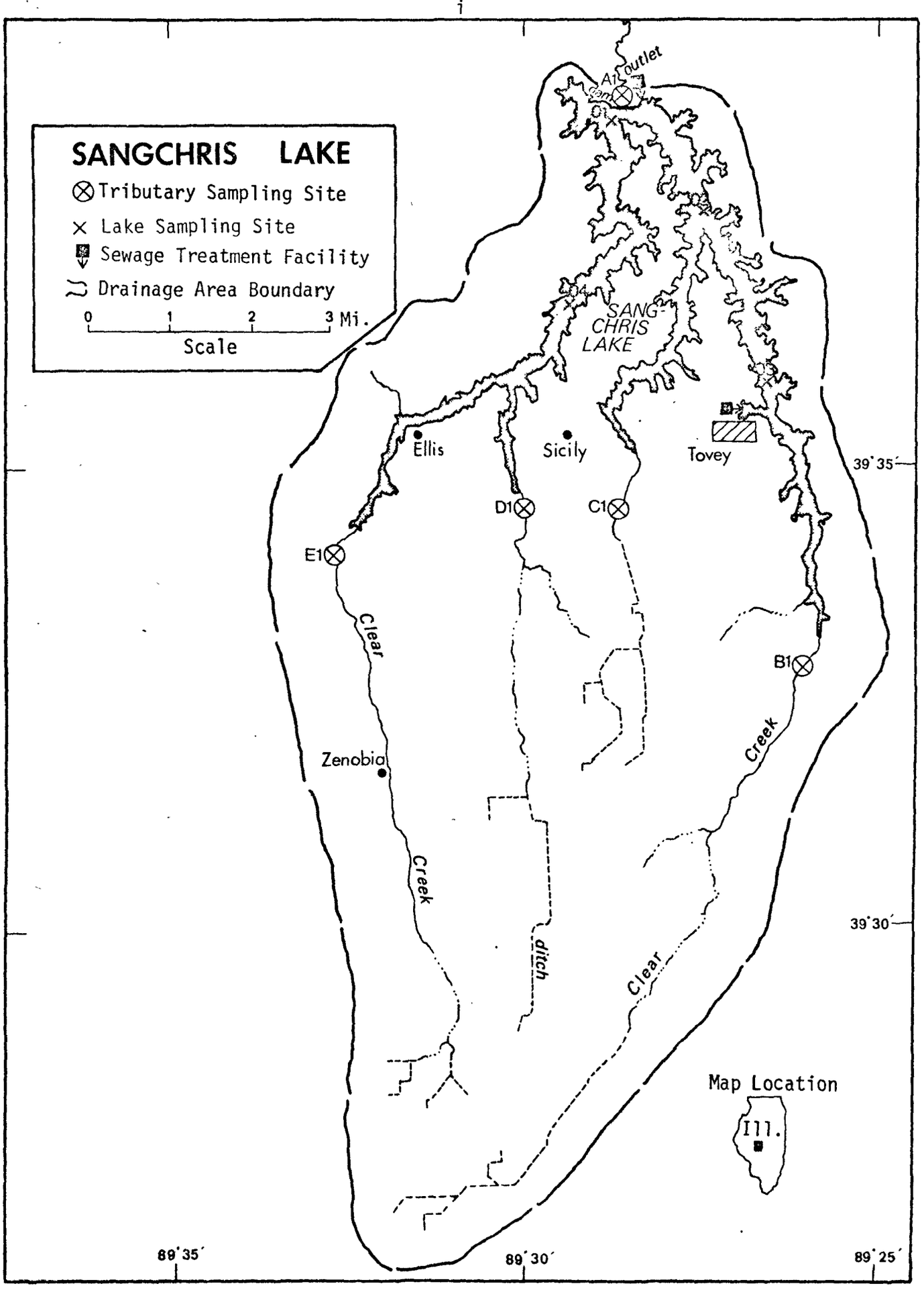
EPA REGION V

NOTICE

This document is a preliminary draft. It has not been formally released by EPA and should not at this stage be construed to represent Agency policy. It is being circulated for comment on its technical accuracy and policy implications.

National Eutrophication Survey
PNERL, Corvallis, OR
NERC, Las Vegas, NV
March, 1975

ENVIRONMENTAL PROTECTION AGENCY


SANGCHRIS LAKE
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Drainage Area Boundary
0 1 2 3 Mi.
Scale
At Outlet
SANG-CHRIS LAKE
Ellis
Sicily
Tovey
D1
C1
E1
B1
Clear Creek
Zenobia
ditch
Clear Creek
39°35'
39°30'
Map Location
Ill.
89°35'
89°30'
89°25'

GH019-53

PRELIMINARY REPORT ON SANGCHRIS LAKE, ILLINOIS*

STORET NO. 1753

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate that Sangchris Lake is eutrophic. It ranked sixth in overall trophic quality when all 31 Illinois lakes were compared using a combination of six parameters**. Three lakes had less median total phosphorus, one had less median dissolved phosphorus, 21 had less median inorganic nitrogen, 13 had less mean chlorophyll a, and ten had a greater mean Secchi disc transparency.

Survey limnologists noted some algae in October and higher aquatic vegetation along about 5% of the shoreline in August.

B. Rate-Limiting Nutrient:

The algal assay results indicate that Sangchris Lake was phosphorus limited at the time the sample was collected. These results are substantiated by the lake data. On all sampling dates, N/P ratios were 35/1 or greater, and limitation by phosphorus would be expected.

C. Nutrient Controllability:

1. Point sources--The estimated phosphorus contribution from known point sources amounted to about 6.5% of the total

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* Table of metric/English conversions--Appendix A.
** See Appendix B.

reaching Sangchris Lake during the sampling year, and essentially all of the point-source input was from the Commonwealth Edison generating station wastewater treatment plant.

The present phosphorus loading rate of 0.38 $g/m^2/yr$ is just in excess of the rate proposed by Vollenweider (in press) as "dangerous"; i.e., a eutrophic rate (see page 12). It is calculated that removal of 80% of the phosphorus at the two point sources included in this study would reduce the loading to a rate just equal to the eutrophic rate. For this reason, all phosphorus inputs to the lake should be minimized to the greatest practicable extent to slow or reverse the aging of the lake.

2. Non-point sources--About 59% of the total phosphorus input to Sangchris Lake came from gaged non-point sources during the sampling year. Clear Creek (eastern) and Clear Creek (western) each contributed over 20% and the unnamed stream (D-1) contributed nearly 10% of the total. Ungaged tributaries were estimated to have contributed 30.1% of the total phosphorus input.

In all, non-point sources, including precipitation, were estimated to have contributed over 93% of the total phosphorus load to Sangchris Lake during the sampling year.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

A. Lake Morphometry†:

1. Surface area: 10.93 kilometers^2.
2. Mean depth: 4.0 meters.
3. Maximum depth: >10.0 meters.
4. Volume: 43.720 x 10^6 m^3.
5. Mean hydraulic retention time: 1.2 years.

B. Tributary and Outlet:
(See Appendix C for flow data)

1. Tributaries -

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
Clear Creek (eastern)	36.0	0.2
Unnamed Creek (C-1)	15.5	0.1
Unnamed Creek (D-1)	20.7	0.1
Clear Creek (western)	32.6	0.2
Minor tributaries & immediate drainage -	73.1	0.6
Totals	177.9	1.2

2. Outlet -

Unnamed Creek (A-1)	188.8**	1.2

C. Precipitation***:

1. Year of sampling: 114.3 centimeters.
2. Mean annual: 88.1 centimeters.

† Simms, 1975.
* For limits of accuracy, see Working Paper No. 175, "Survey Methods, 1973".
** Includes area of lake.
*** See Working Paper No. 175.

III. LAKE WATER QUALITY SUMMARY

Sangchris Lake was sampled three times during the open-water season of 1973 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from four stations on the lake and from a number of depths at each station (see map, page i). During each visit, a single depth-integrated (4.6 m or near bottom to surface) sample was composited from the stations for phytoplankton identification and enumeration; and during the first visit, a single 18.9-liter depth-integrated sample was composited for algal assays. Also each time, a depth-integrated sample was collected from each of the stations for chlorophyll a analysis. The maximum depths sampled were 10.0 meters at station 1, 8.8 meters at station 2, 4.6 meters at station 3, and 5.5 meters at station 4.

The lake sampling results are presented in full in Appendix D and are summarized below.

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR LAKE SANGCHRIS
STORET CODE 1753

PARAMETER	1ST SAMPLING (5/ 7/73) 4 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (8/10/73) 4 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (10/18/73) 4 SITES RANGE	MEAN	MEDIAN
TEMP (C)	16.5 - 18.9	17.8	18.3	24.3 - 32.2	29.4	29.2	18.8 - 22.4	20.6	20.2
DISS OXY (MG/L)	7.8 - 8.8	8.4	8.2	0.5 - 8.4	6.0	6.9	7.2 - 8.8	7.6	7.4
CNDCTVY (MCROMO)	335. - 380.	371.	380.	353. - 454.	424.	424.	380. - 418.	399.	399.
PH (STAND UNITS)	8.0 - 8.1	8.0	8.0	7.2 - 8.9	8.3	8.3	7.9 - 8.4	8.0	8.0
TOT ALK (MG/L)	64. - 79.	74.	77.	93. - 105.	98.	97.	88. - 94.	91.	91.
TOT P (MG/L)	0.079 - 0.156	0.113	0.109	0.021 - 0.134	0.045	0.042	0.035 - 0.065	0.047	0.044
ORTHO P (MG/L)	0.023 - 0.042	0.028	0.025	0.005 - 0.011	0.007	0.006	0.005 - 0.012	0.009	0.008
NO2+NO3 (MG/L)	4.250 - 4.510	4.309	4.300	1.670 - 2.000	1.891	1.910	0.100 - 0.320	0.272	0.290
AMMONIA (MG/L)	0.070 - 0.140	0.090	0.080	0.030 - 0.390	0.079	0.045	0.030 - 0.060	0.038	0.040
KJEL N (MG/L)	0.400 - 0.700	0.529	0.500	0.600 - 1.200	0.843	0.800	0.400 - 0.900	0.585	0.600
INORG N (MG/L)	4.330 - 4.600	4.399	4.385	1.880 - 2.060	1.969	1.970	0.140 - 0.360	0.311	0.330
TOTAL N (MG/L)	4.650 - 5.010	4.838	4.835	2.540 - 3.000	2.734	2.725	0.680 - 1.190	0.857	0.820
CHLRPYL A (UG/L)	2.5 - 4.3	3.2	3.1	26.6 - 48.8	39.0	40.3	12.4 - 22.3	15.6	13.9
SECCHI (METERS)	0.1 - 0.3	0.2	0.2	0.7 - 0.9	0.8	0.9	0.9 - 0.9	0.9	0.9

B. Biological characteristics:

1. Phytoplankton (incomplete at this time) -

Sampling Date	Dominant Genera	Number per ml
05/07/73	1. Flagellates	3,894
	2. Cyclotella	1,533
	3. Dinobryon	226
	4. Scenedesmus	176
	5. Cylindrocystis	151
	Other genera	553
	Total	6,533

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (µg/l)
05/07/73	01	2.8
	02	3.4
	03	2.5
	04	4.3
08/10/73	01	40.6
	02	40.0
	03	48.8
	04	26.6
10/18/73	01	12.4
	02	14.9
	03	22.3
	04	12.9

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum yield (mg/l-dry wt.)
Control	0.020	3.885	7.9
0.050 P	0.070	3.885	26.6
0.050 P + 1.0 N	0.070	4.885	29.2
1.0 N	0.020	4.885	8.2

2. Discussion -

The control yield of the assay alga, Selenastrum capricornutum, indicates that the potential primary productivity of Sangchris Lake was high at the time the sample was collected. A significant increase in yield occurred with the addition of phosphorus alone. Note that the addition of nitrogen alone did not result in a significant difference in yield as compared to the control. Therefore, phosphorus limitation would be expected.

The lake data further indicate phosphorus limitation. At all sampling times, the ratios of inorganic nitrogen to orthophosphorus were 35 to 1 or greater.

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Illinois National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page i), except for the high runoff months of February and March when two samples were collected. Sampling was begun in June, 1973 and was completed in May, 1974.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Illinois District Office of the U.S. Geological Survey for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a U.S. Geological Survey computer program for calculating stream loadings*. Nutrient loads shown are those measured minus point sources, if any.

Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the means of the nutrient loads, in $kg/km^2/year$, at stations B-1, C-1, and D-1 and multiplying the means by the ZZ area in km^2.

The operator of the Commonwealth Edison wastewater treatment plant provided monthly effluent samples and corresponding flow data. However, the flow data provided for the generating station included the large-

* See Working Paper No. 175.

volume condenser discharge, and waste treatment plant loads could not be calculated. Consequently, nutrient loads were estimated at 1.134 kg P and 3.401 kg N/capita/year.

A. Waste Sources:

1. Known treatment plants* -

Name	Pop. Served	Treatment	Mean Flow (m^3/d)	Receiving Water
Commonwealth Edison Station Discharge	208	trickling filter	2.6×10^6**	Sangchris Lake
Tovey Pumphouse	550	stab. pond	181.7	Sangchris Lake

2. Known industrial - None

* Stober, W. G., 1973.
** Includes condenser discharge.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/ yr	% of total
a. Tributaries (non-point load) -		
Clear Creek (eastern)	850	20.3
Unnamed Creek (C-1)	140	3.3
Unnamed Creek (D-1)	400	9.6
Clear Creek (western)	1,070	25.6
b. Minor tributaries & immediate drainage (non-point load) -	1,260	30.1
c. Known treatment plants -		
Commonwealth Edison-Station Discharge	235	5.6
Tovey Pumphouse	35	0.8
d. Septic tanks* -	5	0.1
e. Known industrial - None	-	-
f. Direct precipitation** -	190	4.6
Total	4,185	100.0

2. Outputs -

Lake outlet - Unnamed Creek (A-1)	2,590

3. Net annual P accumulation - 1,595 kg.

* Estimate based on 14 lakeside dwellings and 1 park; see Working Paper No. 175.
** See Working Paper No. 175.

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/ yr	% of total
a. Tributaries (non-point load) -		
Clear Creek (eastern)	47,450	18.8
Unnamed Creek (C-1)	17,950	7.1
Unnamed Creek (D-1)	28,070	11.1
Clear Creek (western)	52,330	20.7
b. Minor tributaries & immediate drainage (non-point load) -	93,380	37.0
c. Known treatment plants -		
Commonwealth Edison-Station Discharge	705	0.3
Tovey Pumphouse	400	0.2
d. Septic tanks* -	185	<0.1
e. Known industrial - None	-	-
f. Direct precipitation** -	11,800	4.7
Total	252,270	100.0

2. Outputs -

Lake outlet - Unnamed Creek (A-1)	129,190

3. Net annual N accumulation - 123,080 kg.

* Estimate based on 14 lakeside dwellings and 1 park; see Working Paper No. 175.
** See Working Paper No. 175.

D. Mean Annual Non-point Nutrient Export by Subdrainage Area:

Tributary	kg P/km^2/yr	kg N/km^2/yr
Clear Creek (eastern)	24	1,318
Unnamed Creek (C-1)	9	1,158
Unnamed Creek (D-1)	19	1,356
Clear Creek (western)	33	1,605

E. Yearly Loading Rates:

In the following table, the existing phosphorus loading rates are compared to those proposed by Vollenweider (in press). Essentially, his "dangerous" rate is the rate at which the receiving water would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous" and "permissible".

Note that Vollenweider's model may not be applicable to water bodies with very short hydraulic retention times.

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m^2/yr	0.38	0.15	23.1	11.3

Vollenweider loading rates for phosphorus (g/m^2/yr) based on mean depth and mean hydraulic retention time of Sangchris Lake:

"Dangerous" (eutrophic rate)	0.36
"Permissible" (oligotrophic rate)	0.18

V. LITERATURE REVIEWED

Simms, Neil, 1975. Personal communication (lake morphometry). Commonwealth Edison, Kincaid.

Stober, W. G., 1973. Treatment plant questionnaire (Commonwealth Edison station and Tovey pumphouse STP's). Kincaid.

Vollenweider, Richard A. (in press). Input-output models. Schweiz. Z. Hydrol.

VII. APPENDICES

APPENDIX A

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Meters x 3.281 = feet

Cubic meters x 8.107×10^{-4} = acre feet

Square kilometers x 0.3861 = square miles

Cubic meters/sec x 35.315 = cubic feet/sec

Centimeters x 0.3937 = inches

Kilograms x 2.205 = pounds

Kilograms/square kilometer x 5.711 = lbs/square mile

APPENDIX B

LAKE RANKINGS

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500- MEAN SEC	MEAN CHLORA	10- MIN DO	MEDIAN DISS -
1703	LAKE BLOOMINGTON	0.056	5.730	484.667	25.200	14.500	0.020
1706	LAKE CARLYLE	0.064	1.270	477.889	17.367	11.000	0.032
1708	LAKE CHARLESTON	0.160	4.680	490.667	12.000	8.400	0.005
1711	COFFEEN LAKE	0.032	0.260	456.222	7.700	14.900	0.012
1712	CRAB ORCHARD LAKE	0.082	0.200	482.222	54.867	13.500	0.013
1714	LAKE DECATUR	0.129	3.750	479.571	43.000	14.500	0.062
1725	LONG LAKE	0.704	1.190	482.667	49.333	8.800	0.398
1726	LAKE LOU YAEGER	0.186	1.600	489.583	16.662	11.400	0.076
1727	LAKE MARIE	0.096	0.370	487.667	39.533	14.700	0.057
1733	PISTAKEE LAKE	0.203	0.370	485.667	75.867	7.600	0.062
1735	RENO LAKE	0.071	0.210	471.500	23.533	12.700	0.012
1739	LAKE SHELBYVILLE	0.062	3.290	481.333	17.161	14.500	0.019
1740	SILVER LAKE (HIGHLAND)	0.226	0.970	489.500	5.822	14.800	0.057
1742	LAKE SPRINGFIELD	0.108	3.265	483.385	13.013	10.600	0.059
1748	VERMILION LAKE	0.109	4.695	481.500	31.150	14.200	0.050
1750	WONDER LAKE	0.426	0.890	486.000	98.533	7.800	0.132
1751	LAKE STORY	0.072	2.510	459.333	17.250	14.600	0.021
1752	DEPUE LAKE	0.438	4.050	490.000	58.833	7.600	0.276
1753	LAKE SANGCHRIS	0.050	1.970	475.417	19.292	14.500	0.009
1754	LAKE HOLIDAY	0.167	3.135	485.167	51.217	7.200	0.048
1755	FOX LAKE	0.219	0.375	486.167	63.850	8.800	0.083
1756	GRASS LAKE	0.301	0.820	481.000	83.500	5.900	0.093
1757	EAST LOON LAKE	0.076	0.120	456.000	22.300	14.900	0.018
1758	SLOCUM LAKE	0.865	0.200	487.333	221.100	5.500	0.392
1759	CEDAR LAKE	0.029	0.170	400.333	5.767	12.800	0.013
1761	LAKE MEMATUK	0.059	1.770	486.333	7.967	14.300	0.031
1762	RACCOON LAKE	0.106	0.310	484.333	19.217	13.800	0.020
1763	BALDWIN LAKE	0.044	0.140	461.167	11.333	13.200	0.007

LAKE DATA TO BE USED IN RANKINGS

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS P
1764	LAKE VANDALIA	0.115	0.480	476.111	11.278	14.800	0.023
1765	OLD BEN MINE RESERVOIR	0.930	0.205	478.333	31.433	11.200	0.575
1766	HORSESHOE LAKE	0.127	0.705	482.833	182.250	6.800	0.016

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	300- MEAN SEC	MEAN CHLORA	1S- MIN DO	MEDIAN DISS P	INDEX NO
1703	LAKE BLOOMINGTON	88 (26)	0 (0)	80 (24)	47 (14)	13 (2)	90 (20)	290
1706	LAKE CARLYLE	63 (19)	40 (12)	63 (19)	63 (19)	63 (19)	53 (16)	345
1708	LAKE CHARLESTON	37 (11)	7 (2)	0 (0)	77 (23)	77 (23)	27 (8)	225
1711	COFFEEN LAKE	97 (29)	77 (23)	93 (28)	93 (28)	2 (0)	92 (27)	454
1712	CRAB ORCHARD LAKE	67 (20)	90 (27)	43 (13)	20 (6)	42 (12)	85 (25)	347
1714	LAKE DECATUR	40 (12)	13 (4)	53 (16)	33 (10)	30 (8)	32 (9)	201
1725	LONG LAKE	7 (2)	43 (13)	40 (12)	30 (9)	72 (21)	3 (1)	195
1726	LAKE LOU YAEGER	30 (9)	37 (11)	7 (2)	87 (26)	57 (17)	23 (7)	241
1727	LAKE MARIE	60 (18)	68 (20)	73 (22)	37 (11)	23 (7)	42 (12)	303
1733	PISTAKEE LAKE	27 (8)	68 (20)	23 (7)	13 (4)	90 (27)	32 (9)	253
1735	REND LAKE	77 (23)	80 (24)	70 (21)	50 (15)	53 (16)	92 (27)	422
1739	LAKE SHELBYVILLE	83 (25)	17 (5)	83 (25)	70 (21)	13 (2)	73 (22)	339
1740	SILVER LAKE (HIGHLAND)	20 (6)	47 (14)	10 (3)	97 (29)	13 (2)	42 (12)	229
1742	LAKE SPRINGFIELD	53 (16)	20 (6)	33 (10)	73 (22)	67 (20)	37 (11)	283
1748	VERMILION LAKE	50 (15)	3 (1)	47 (14)	43 (13)	37 (11)	47 (14)	227
1750	WONDER LAKE	13 (4)	50 (15)	20 (6)	7 (2)	80 (24)	13 (4)	183
1751	LAKE STORY	73 (22)	27 (8)	90 (27)	67 (20)	13 (2)	63 (19)	333
1752	DEPUE LAKE	10 (3)	10 (3)	3 (1)	23 (7)	83 (25)	10 (3)	139
1753	LAKE SANGCHRIS	88 (26)	30 (9)	67 (20)	57 (17)	30 (8)	97 (29)	369
1754	LAKE HOLIDAY	33 (10)	23 (7)	27 (8)	27 (8)	87 (26)	50 (15)	247
1755	FOX LAKE	23 (7)	63 (19)	17 (5)	17 (5)	72 (21)	20 (6)	212
1756	GRASS LAKE	17 (5)	53 (16)	50 (15)	10 (3)	97 (29)	17 (5)	244
1757	EAST LOON LAKE	70 (21)	100 (30)	97 (29)	53 (16)	2 (0)	77 (23)	399
1758	SLOCUM LAKE	3 (1)	87 (26)	13 (4)	0 (0)	100 (30)	7 (2)	216
1759	CEDAR LAKE	100 (30)	93 (28)	100 (30)	100 (30)	50 (15)	85 (25)	528
1761	LAKE WEMATUK	80 (24)	33 (10)	77 (23)	90 (27)	30 (8)	57 (17)	367
1762	RACCOON LAKE	57 (17)	73 (22)	30 (9)	60 (18)	42 (12)	68 (20)	330
1763	BALDWIN LAKE	93 (28)	97 (29)	87 (26)	80 (24)	47 (14)	100 (30)	504

PERCENT OF LAKES WITH HIGHER VALUES (NUMBER OF LAKES WITH HIGHER VALUES)

LAKE CODE	LAKE NAME	MEDIAN TOTAL P	MEDIAN INORG N	500-MEAN SEC	MEAN CHLORA	15-MIN DO	MEDIAN DISS P	INDEX NO
1764	LAKE VANDALIA	47 (14)	60 (18)	60 (18)	83 (25)	13 (2)	60 (18)	323
1765	OLD BEN MINE RESERVOIR	0 (0)	83 (25)	57 (17)	46 (12)	60 (18)	0 (0)	240
1766	HORSESHOE LAKE	43 (13)	57 (17)	37 (11)	3 (1)	93 (28)	80 (24)	313

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	1759	CEDAR LAKE	526
2	1763	BALDWIN LAKE	504
3	1711	COFFEEN LAKE	454
4	1735	RENO LAKE	422
5	1757	EAST LUON LAKE	399
6	1753	LAKE SANGCHRIS	369
7	1761	LAKE MEMATON	367
8	1712	CRAB ORCHARD LAKE	347
9	1706	LAKE CARLYLE	345
10	1739	LAKE SHELBYVILLE	339
11	1751	LAKE STORY	333
12	1762	RACCOON LAKE	330
13	1764	LAKE VANDALIA	323
14	1766	HORSESHOE LAKE	313
15	1727	LAKE MARIE	303
16	1703	LAKE BLOOMINGTON	296
17	1742	LAKE SPRINGFIELD	283
18	1733	PISTAKEE LAKE	253
19	1754	LAKE HOLIDAY	247
20	1756	GRASS LAKE	244
21	1726	LAKE LOU YAEGER	241
22	1765	OLD BEN MINE RESERVOIR	240
23	1740	SILVER LAKE (HIGHLAND)	229
24	1748	VERMILION LAKE	227
25	1708	LAKE CHARLESTON	225
26	1755	FOX LAKE	212
27	1758	SLOCUM LAKE	210
28	1714	LAKE DECATUR	201

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
29	1725	LONG LAKE	195
30	1750	WONDER LAKE	183
31	1752	DEPUE LAKE	139

APPENDIX C

TRIBUTARY FLOW DATA

LAKE CODE 1753 SANGCHRIS LAKE

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 188.8

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
1753A1	188.8	1.24	1.83	2.29	2.36	1.86	1.55	0.94	0.49	0.35	0.39	0.56	0.67	1.21
1753B1	36.0	0.22	0.35	0.42	0.44	0.34	0.29	0.17	0.09	0.06	0.06	0.10	0.12	0.22
1753C1	15.5	0.09	0.15	0.18	0.19	0.15	0.13	0.07	0.04	0.02	0.02	0.04	0.05	0.09
1753D1	20.7	0.12	0.20	0.24	0.25	0.19	0.17	0.10	0.05	0.03	0.03	0.05	0.06	0.13
1753E1	32.6	0.20	0.32	0.39	0.40	0.31	0.27	0.16	0.08	0.05	0.06	0.09	0.10	0.20
1753Z2	83.9	0.60	0.81	1.06	1.10	0.87	0.69	0.45	0.24	0.18	0.21	0.29	0.33	0.57

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 188.8
SUM OF SUB-DRAINAGE AREAS = 188.8
TOTAL FLOW IN = 14.55
TOTAL FLOW OUT = 14.54

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
1753A1	6	73	7.31	3	1.08				
	7	73	1.67	8	0.24				
	8	73	0.0	19	0.0				
	9	73	0.0	8	0.0				
	10	73	0.0	14	0.0				
	11	73	0.23	3	0.02				
	12	73	1.27	2	0.76				
	1	74	7.25	5	0.82				
	2	74	3.74	2	2.44	16	4.16		
	3	74	3.06	2	3.79	16	2.97		
	4	74	2.15	6	1.61				
	5	74	2.58	4	0.59				
1753B1	6	73	1.64	3	0.21				
	7	73	0.31	8	0.04				
	8	73	0.02	19	0.0				
	9	73	0.00	8	0.0				
	10	73	0.00	14	0.0				
	11	73	0.04	3	0.00				
	12	73	0.22	2	0.13				
	1	74	1.30	5	0.15				
	2	74	0.71	2	0.45	16	0.79		
	3	74	0.57	2	0.71	16	0.57		
	4	74	0.40	6	0.28				
	5	74	0.48	4	0.11				

TRIBUTARY FLOW INFORMATION FOR ILLINOIS 2/3/75

LAKE CODE 1753 SANGCHRIS LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
1753C1	6	73	0.71	3	0.09				
	7	73	0.13	8	0.02				
	8	73	0.01	19	0.0				
	9	73	0.0	8	0.0				
	10	73	0.0	14	0.0				
	11	73	0.02	3	0.00				
	12	73	0.09	2	0.05				
	1	74	0.54	5	0.06				
	2	74	0.31	2	0.20	16	0.34		
	3	74	0.24	2	0.31	16	0.24		
	4	74	0.17	6	0.13				
	5	74	0.20	4	0.05				
1753D1	6	73	0.93	3	0.12				
	7	73	0.17	8	0.02				
	8	73	0.01	19	0.0				
	9	73	0.0	8	0.0				
	10	73	0.00	14	0.0				
	11	73	0.02	3	0.02				
	12	73	0.12	2	0.07				
	1	74	0.74	5	0.08				
	2	74	0.42	2	0.27	16	0.45		
	3	74	0.31	2	0.40	16	0.31		
	4	74	0.23	6	0.17				
	5	74	0.07	4	0.06				
1753E1	6	73	1.47	3	0.19				
	7	73	0.27	8	0.04				
	8	73	0.02	19	0.0				
	9	73	0.00	8	0.0				
	10	73	0.00	14	0.0				
	11	73	0.03	3	0.00				
	12	73	0.20	2	0.12				
	1	74	1.16	5	0.14				
	2	74	0.65	2	0.42	16	0.74		
	3	74	0.51	2	0.65	16	0.51		
	4	74	0.37	6	0.27				
	5	74	0.12	4	0.10				
1753Z2	6	73	3.82	3	0.48				
	7	73	0.79	8	0.11				
	8	73	0.05	19	0.0				
	9	73	0.01	8	0.0				
	10	73	0.01	14	0.01				
	11	73	0.11	3	0.01				
	12	73	0.65	2	0.40				
	1	74	3.51	5	0.40				
	2	74	1.64	2	1.08	16	1.84		
	3	74	1.42	2	1.73	16	1.36		
	4	74	0.99	6	0.76				
	5	74	1.70	4	0.28				

APPENDIX D

PHYSICAL and CHEMICAL DATA

STORET RETRIEVAL DATE 75/02/11

17S301
39 38 40.0 089 28 50.0
LAKE SANGCHRIS
17021 ILLINOIS

TEMPALES 2111202
3 0028 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/07	13 30	0000	18.3		10	380	8.10	79	0.080	0.600	4.340	0.024
	13 30	0004	18.3	8.2		380	8.10	77	0.090	0.500	4.510	0.024
	13 30	0015	18.3	8.2		380	8.00	77	0.090	0.500	4.300	0.025
	13 30	0025	18.3	8.2		380	8.00	78	0.070	0.500	4.300	0.024
73/08/10	09 40	0000	31.1		36	443	8.30	97	0.070	1.000	1.980	0.008
	09 40	0005	31.1	7.0		443	7.80	96	0.030	0.600	1.940	0.006
	09 40	0015	29.0	7.6		431	7.60	93	0.040	0.800	1.860	0.006
	09 40	0026	24.3	6.5		353	7.20	105	0.390	1.100	1.670	0.006
73/10/18	09 20	0000	21.2		34	401	8.00	92	0.040	0.900	0.290	0.012
	09 20	0005	21.2	7.4		402	8.00	93	0.030	0.600	0.300	0.011
	09 20	0015	21.0	7.4		400	7.90	93	0.030	0.500	0.300	0.011
	09 20	0033	19.8	7.2		390	7.90	92	0.040	0.500	0.320	0.011

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/07	13 30	0000	0.102	2.8
	13 30	0004	0.120	
	13 30	0015	0.102	
	13 30	0025	0.095	
73/08/10	09 40	0000	0.037	40.6
	09 40	0005	0.026	
	09 40	0015	0.025	
	09 40	0026	0.021	
73/10/18	09 20	0000	0.040	12.4
	09 20	0005	0.047	
	09 20	0015	0.049	
	09 20	0033	0.065	

STORET RETRIEVAL DATE 73/02/11

175302
39 37 40.0 089 27 35.0
LAKE SANGCHRIS
17021 ILLINOIS

11EPALES 21112U2
3 0030 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/07	14 00	0000	18.9		8	380	8.00	78	0.080	0.600	4.250	0.025
	14 00	0004	18.9	7.8		380	8.10	78	0.090	0.500	4.290	0.024
	14 00	0015	18.9	8.2		380	8.00	77	0.080	0.500	4.350	0.025
	14 00	0026	18.9	8.0		380	8.00	77	0.070	0.500	4.320	0.023
73/08/10	10 10	0000	32.2		28	454	8.20	96	0.050	1.000	2.000	0.005
	10 10	0005	31.8	6.2		447	8.30	97	0.050	0.700	1.950	0.007
	10 10	0015	29.1	5.8		423	8.40	97	0.060	0.800	1.910	0.007
	10 10	0023	27.5	2.0		425	8.30	99	0.170	1.200	1.780	0.011
73/10/18	09 50	0000	22.4		34	416	8.00	89	0.050	0.700	0.280	0.007
	09 50	0005	21.8	7.6		414	8.00	88	0.030	0.500	0.280	0.008
	09 50	0015	21.2	7.2		407	8.00	91	0.050	0.400	0.280	0.010
	09 50	0024	20.2	7.4		397	8.10	90	0.060	0.500	0.210	0.008

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/07	14 00	0000	0.114	3.4
	14 00	0004	0.115	
	14 00	0015	0.104	
	14 00	0026	0.113	
73/08/10	10 10	0000	0.024	46.0
	10 10	0005	0.048	
	10 10	0015	0.049	
	10 10	0023	0.134	
73/10/18	09 50	0000	0.042	14.9
	09 50	0005	0.043	
	09 50	0015	0.044	
	09 50	0024	0.055	

STORET RETRIEVAL DATE 75/02/11

175303
39 35 50.0 089 26 45.0
LAKE SANGCHRIS
17021 ILLINOIS

11EPALES 2111202
3 0019 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 NO2&NO3 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/07	14 30	0000	16.6		2	340	8.00	69	0.120	0.700	4.280	0.042
	14 30	0004	16.6	8.8		340	8.00	70	0.110	0.600	4.250	0.040
	14 30	0015	16.5	8.8		335	8.00	67	0.140	0.500	4.300	0.042
73/08/10	10 30	0000	30.0		33	424	8.90	97	0.050	0.900	1.880	0.007
	10 30	0005	28.9	8.0		418	8.80	98	0.040	0.800	1.940	0.007
	10 30	0013	26.2	8.4		410	8.20	97	0.040	0.700	1.840	0.009
73/10/18	10 10	0000	20.1		35	396	8.40	89	0.030	0.600	0.220	0.005
	10 10	0014	18.8	8.8		380	8.40	94	0.040	0.700	0.100	0.007

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/07	14 30	0000	0.156	2.5
	14 30	0004	0.153	
	14 30	0015	0.142	
73/08/10	10 30	0000	0.050	45.8
	10 30	0005	0.047	
	10 30	0013	0.050	
73/10/18	10 10	0000	0.042	22.3
	10 10	0014	0.053	

STORET RETRIEVAL DATE 73/02/11

175304
39 35 40.0 089 29 30.0
LAKE SANGCHRIS
17021 ILLINOIS

11EPALES 2111202
3 0014 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00610 NH3-N TOTAL MG/L	00625 TOT KJEL N MG/L	00630 N02&N03 N-TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P
73/05/07	14	50 0000	16.8		4	380	8.00	74	0.080	0.600	4.290	0.028
	14	50 0004	16.8	8.5		380	8.00	76	0.080	0.400	4.300	0.026
	14	50 0010	16.7	8.8		380	8.00	64	0.080	0.400	4.250	0.025
73/08/10	10	45 0000	29.8		36	424	8.80	99	0.040	0.900	1.860	0.006
	10	45 0005	29.3	7.8		423	8.00	98	0.030	0.700	1.910	0.006
	10	45 0014	28.9	6.8		422	8.00	99	0.040	0.600	1.950	0.006
73/10/14	10	35 0000	19.9		35	393	8.00	89	0.030	0.600	0.320	0.006
	10	35 0005	19.9	7.8			7.90	90	0.030	0.600	0.320	0.008
	10	35 0018	19.7	8.0		390	7.90	93	0.040	0.500	0.320	0.008

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L
73/05/07	14	50 0000	0.096	4.3
	14	50 0004	0.094	
	14	50 0010	0.079	
73/08/10	10	45 0000	0.035	26.0
	10	45 0005	0.033	
	10	45 0014	0.047	
73/10/14	10	35 0000	0.033	12.9
	10	35 0005	0.035	
	10	35 0018	0.032	

APPENDIX E

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 75/03/03

17553A1
39 39 00.0 089 28 35.0
UNNAMED CREEK
17 CHRISTIAN CO MAP
O/SANG CRIS LAKE
CHRISTIAN CO HWY 20 BRDG JUST BELO DAM
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/06/03	11 20		3.900	2.800	0.084	0.012	0.045
73/07/08	10 40		3.500	0.970	0.033	0.010	0.030
73/08/19	10 25		1.000	1.050	0.246	0.024	0.050
73/09/08	11 00		0.210	1.700	0.370	0.105	0.155
73/10/14	09 45		0.430	0.800	0.220	0.054	0.120
73/11/03	10 45		0.460	0.800	0.092	0.054	0.195
73/12/02	09 45		0.420	0.500	0.032	0.048	0.085
74/01/05	10 00		0.900	0.400	0.068	0.010	0.030
74/02/02	14 45		2.760	0.500	0.070	0.030	0.055
74/02/16	09 45		3.200	0.600	0.080	0.030	0.055
74/03/02	10 00		3.600	0.800	0.060	0.015	0.055
74/03/16	10 00		4.115	0.650	0.075	0.015	0.047
74/04/06	10 00		3.960	0.800	0.015	0.010	0.035
74/05/04	09 50		3.600	0.500	0.050	0.010	0.050

STORET RETRIEVAL DATE 75/03/03

175361
39 32 40.0 089 26 10.0
CLEAR CREEK (EASTERN
17 CHRISTIAN CO MAP
T/SANG CRIS LAKE
SEC RD BRDG 2.5 MI SW OF KINCAID
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/06/03	10 55		6.500	1.760	0.110	0.035	0.095
73/07/08	10 15		7.900	0.440	0.063	0.030	0.070
73/08/19	10 03		2.000	1.600	0.066	0.060	0.145
73/09/06	10 35			2.900	0.096	0.063	0.230
73/10/14	09 25		1.760	1.450	0.130	0.120	0.300
73/11/03	10 30		1.680	1.100	0.052	0.078	0.300
73/12/02	09 40		3.960	0.400	0.044	0.052	0.080
74/01/05	09 45		7.200	0.200	0.016		0.036
74/02/02	14 30		7.560	0.400	0.040	0.040	0.055
74/02/16	09 30		7.200	0.200	0.022	0.022	0.045
74/03/02	09 40		7.500	0.900	0.035	0.040	0.090
74/03/16	09 40		7.800	0.400	0.025	0.030	0.075
74/04/06	09 45		7.500	0.500	0.010	0.035	0.090
74/05/04	09 30		7.700	0.500	0.025	0.030	0.090

STORET RETRIEVAL DATE 75/03/03

1753C1
39 34 30.0 089 28 35.0
UNNAMED CREEK
17 CHRISTIAN CO MAP
T/SANG CRIS LAKE
SEC RD BRDG 1.5 MI SW OF TOVEY
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/06/03	10 45		5.700	0.540	0.052	0.012	0.045
73/07/08	10 05		7.400	0.150	0.031	0.013	0.050
73/08/19	09 55		0.250	2.600	0.290	0.037	0.170
73/09/08	10 15		0.510	3.900	0.380	0.300	
73/10/14	09 15		0.360	0.900	0.063	0.034	0.145
73/11/03	10 10		0.310	1.550	0.060	0.030	0.030
73/12/02	09 30		2.000	0.800	0.072	0.020	0.055
74/01/05	09 35		7.800	0.200	0.016	0.012	0.025
74/02/02	14 15		8.400	0.100K	0.012	0.020	0.020
74/02/16	09 20		7.900	0.200	0.015	0.010	0.025
74/03/02	09 30		8.400	0.500	0.015	0.015	0.040
74/03/16	09 30		8.600	0.400	0.015	0.010	0.025
74/04/06	09 40		8.000	0.600	0.020	0.015	0.015
74/05/04	09 15		6.500	0.950	0.035	0.005	0.030

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/03/03

175301
39 34 30.0 089 30 00.0
UNNAMED CREEK
17 CHRISTIAN CO MAP
T/SANG CHRIS LAKE
SEC RD BRDG 1 MI SW OF SICILY
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/06/03	10	35	6.700	2.800	0.088	0.030	0.120
73/07/08	09	55	8.600	0.200	0.072	0.028	0.095
73/08/19	09	45	1.200	1.980	0.046	0.044	0.165
73/09/08	09	50	0.105	1.800	0.073	0.198	0.360
73/10/14	09	10	0.300	1.050	0.079	0.072	0.220
73/11/03	10	00	1.140	1.200	0.052	0.069	0.375
73/12/02	09	15	1.380	1.600	0.060	0.056	0.056
74/01/05	09	25	7.980	0.300	0.020	0.016	0.025
74/02/02	14	10	8.900	0.100	0.015	0.025	0.027
74/02/16	09	15	8.200	0.300	0.015	0.015	0.040
74/03/02	09	25	8.800	0.500	0.010	0.025	0.055
74/03/16	09	25	9.000	0.200	0.015	0.020	0.045
74/04/06	09	30	8.200	0.500	0.025	0.030	0.045
74/05/04	09	05	7.400	0.700	0.020	0.015	0.065

STORET RETRIEVAL DATE 75/03/03

1753E1
39 33 50.0 089 32 40.0
CLEAR CREEK (WESTERN)
17 SANGAMON CO MAP
T/SANG CHRIS LAKE
SEC RD BRDG 2 MI SE OF PAWNEE
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
73/06/03	10	25	8.100	0.250	0.110	0.056	0.125
73/07/08	09	45	9.600	0.220	0.052	0.040	0.070
73/08/19	09	30	1.300	1.950	0.092	0.132	0.200
73/09/08	09	35	2.700	2.310	0.370	0.294	0.540
73/10/14	09	00	2.300	2.000	0.110	0.273	0.550
73/11/03	09	45	6.800	1.250	0.056	0.154	0.420
73/12/02	09	00	4.100	0.900	0.056	0.088	0.110
74/01/05	09	10	8.400	0.300	0.016	0.032	0.050
74/02/02	13	50	9.200	0.200	0.015	0.040	0.055
74/02/16	09	10	8.700	0.200	0.015	0.030	0.050
74/03/02	09	20	8.500	0.600	0.015	0.045	0.100
74/03/16	09	20	8.800	0.400	0.015	0.040	0.095
74/04/06	09	30	8.100	0.600	0.020	0.045	0.095
74/05/04	09	00	8.700	0.500	0.025	0.035	0.085

STORET RETRIEVAL DATE 75/03/03

17b321 TF175321
39 39 00.0 089 28 35.0
COMMONWEALTH EDISON STATN DSCHRG
17 CHRISTIAN COUNTY
D/SANG CHRIS RESERVOIR
SANG CHRIS RESERVOIR
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/07/24	13	30	2.100	2.800	0.480	0.720	1.100	690.000	690.000
73/08/10	15	00	1.540	0.860	0.270	0.100	1.160	690.000	690.000
73/09/26	00	00	0.360	0.665	0.530	0.110		690.000	690.000
73/10/24			0.252	0.650	0.005K	0.273	0.510	690.000	690.000
73/11/28			0.360	0.530	0.046	0.062	0.260	690.000	690.000
74/02/25	12	00	3.520	1.000K	0.050K	0.050K	0.056	690.000	690.000
74/03/20			4.000	1.000K	0.110	0.077	0.097	690.000	690.000
74/04/16			4.300	1.000K	0.050K	0.220	0.170	690.000	690.000
74/05/21			3.400	1.000K	0.072	0.022	0.030	690.000	690.000
74/06/11			3.900	1.000K	0.050K	0.088	0.100	690.000	690.000
74/07/17			3.340	1.000K	0.150	0.069	0.110	690.000	690.000
74/08/14			1.920	1.000K	0.050K	0.063	0.110	690.000	690.000

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 75/03/03

175331 ST175331 P000550
39 39 00.0 089 28 35.0
COMMONWEALTH EDISON TOBY PUMPHOU
17 CHRISTIAN COUNTY
D/SANG CHRIS RESERVOIR
SANG CHRIS RESERVOIR
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/07/24	13	30	6.900	0.130	0.130	0.150	0.320	0.048	0.048
73/08/10	15	00	0.920	1.600	0.140	0.070	2.300	0.048	0.048
73/09/26	00	00	2.600	3.400	0.010K	0.020	0.375	0.048	0.048
73/10/24			2.940	1.700	0.022	0.038	0.059	0.048	0.048
73/11/28			5.100	0.500K	0.024	0.140	0.380	0.048	0.048
74/02/26	12	00	7.200	1.000K	0.050K	0.050K	0.910	0.048	0.048
74/03/20			6.000	1.200	0.094	0.056	0.348	0.048	0.048
74/04/16			5.520	1.000K	0.084	0.150	0.330	0.048	0.048
74/05/21	13	00	4.900	1.000K	0.050K	0.110	0.950	0.048	0.048
74/06/11			7.800	1.000K	0.120	0.056	0.220	0.048	0.048
74/07/17			4.000	1.000K	0.140	0.055	0.055	0.048	0.048
74/08/14			4.100	1.000K	0.050K	0.050K	0.270	0.048	0.048

K VALUE KNOWN TO BE
LESS THAN INDICATED