U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EUTROPHICATION SURVEY

WORKING PAPER SERIES

REPORT

ON

LAKE EUFAULA

HASKEL, OKMULGEE, MCINTOSH, AND

PITTSBURG COUNTIES

OKLAHOMA

EPA REGION VI

WORKING PAPER No. 584

CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON

and

ENVIRONMENTAL MONITORING & SUPPORT LABORATORY - LAS VEGAS, NEVADA

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WITH THE COOPERATION OF THE
OKLAHOMA DEPARTMENT OF POLLUTION CONTROL
AND THE
OKLAHOMA NATIONAL GUARD
MARCH, 1977

REPORT ON LAKE EUFAULA

HASKEL, OKMULGEE, MCINTOSH, AND PITTSBURG COUNTIES, OKLAHOMA

by

National Eutrophication Survey

Water and Land Monitoring Branch
Monitoring Applications Laboratory
Environmental Monitoring & Support Laboratory
Las Vegas, Nevada

and

Eutrophication Survey Branch
Corvallis Environmental Research Laboratory
Corvallis, Oregon

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OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY

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FOREWORD

The National Eutrophication Survey was initiated in 1972 in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to freshwater lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations, and impact on selected freshwater lakes as a basis for formulating comprehensive and coordinated national, regional, and state management practices relating to point source discharge reduction and nonpoint source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations, and impacts can be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin, and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

In this report, the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin is documented. The report is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's freshwater lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export, and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by the U.S. Environmental Protection Agency and to augment plans implementation by the states.

ACKNOWLEDGMENTS

The staff of the National Eutrophication Survey (Office of Research and Development, U.S. Environmental Protection Agency) expresses sincere appreciation to the Oklahoma Department of Pollution Control for professional involvement, to the Oklahoma National Guard for conducting the tributary sampling phase of the Survey, and to those Oklahoma wastewater treatment plant operators who provided effluent samples and flow data.

Dr. Denver Talley, Director, Oklahoma Department of Pollution Control; the staff of the Oklahoma Water Resources Board; and the staff of the Oklahoma State Department of Health reviewed the preliminary reports and provided critiques most useful in the preparation of this Working Paper Series.

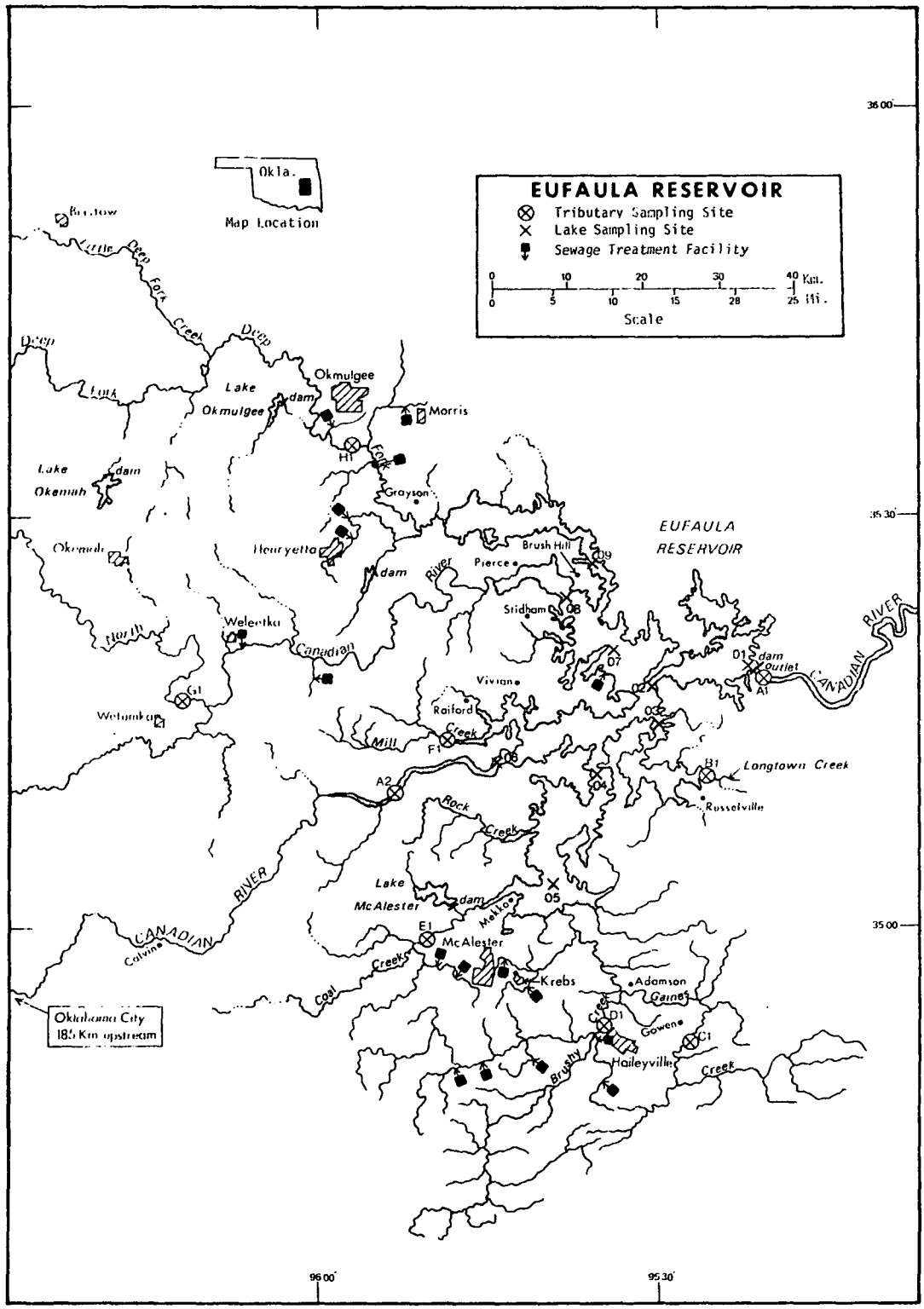
Major General John Coffey, Jr., the Adjutant General of Oklahoma, and Project Officers Colonel Curtis W. Milligan and Major James O. Haney, Jr., who directed the volunteer efforts of the Oklahoma National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF OKLAHOMA

LAKE NAME	COUNTY
Altus Reservoir	Greer, Kiowa
Arbuckle Lake	Murray
Lake Elsworth	Caddo, Comanche
Lake Eufaula	Haskell, McIntosh, Okmulgee, Pittsburg
Fort Cobb Reservoir	Caddo
Fort Supply Reservoir	Woodward
Foss Dam Reservoir	Custer
Lake Frances	Adair
Grand Lake O' The Cherokees	Mayes, Delaware, Craig, Ottowa
Lake Hefner	Oklahoma
Keystone Reservoir	Tulsa, Creek, Osage, Pawnee
Oologah Lake	Nowata, Rogers
Tenkiller Ferry Reservoir	Cherokee, Sequoyah
Lake Thunderbird	Cleveland
Wister Reservoir	LeFlore


EUFAULA RESERVOIR
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Scale
Okla.
Map Location
EUFAULA RESERVOIR
Lake Eufaula
Lake Okmulgee
Lake Okemah
Okmulgee
Morris
Grayson
Henryetta
Okemah
Welertka
Wetumka
Vivian
Raiford
Brush Hill
Pierce
Stidham
Russetville
Longtown Creek
Lake McAlester
McAlester
Krebs
Adamson
Gaines
Gowen
Haileyville
Canadian River
Deep Fork Creek
Little Deep Fork Creek
Mill Creek
Rock Creek
Coal Creek
Brushy Creek
Oklahoma City
185 Km upstream
36 00
35 30
35 00
96 00
95 30

REPORT ON LAKE EUFAULA, OKLAHOMA

STORET NO. 4004

I. CONCLUSIONS

A. Trophic Condition:

Based upon Survey data, Lake Eufaula is considered eutrophic, i.e., nutrient rich and highly productive. Whether such nutrient enrichment is to be considered beneficial or deleterious is determined by its actual or potential impact upon designated beneficial water uses of each lake.

Chlorophyll a values in the lake ranged from 0.9 µg/l in June to 25.4 µg/l in October with a mean of 4.4 µg/l. Potential for primary production as measured by algal assay control yield was high. Of the 16 Oklahoma lakes sampled (including Lake Texoma), only 3 had higher median total phosphorus levels (0.081 mg/l), 5 had higher median inorganic nitrogen values (0.405 mg/l), and 5 had higher median orthophosphorus levels (0.029 mg/l) than Lake Eufaula.

Field limnologists did not note any phytoplankton blooms or widespread macrophytes. However, it was noted that the lake was highly turbid on all sampling occasions; the low Secchi disc transparencies (range of 0.2 to 1.1 m) suggest that primary productivity in the lake is light limited.

B. Rate-Limiting Nutrient:

The algal assay results indicate that nitrogen was the primary limiting nutrient in Lake Eufaula during the spring sampling period and phosphorus was limiting during fall. The lake data suggest nitrogen limitation in the lake on all four sampling occasions. However, the low light penetration is likely a major, if not overriding, consideration in the limitation of productivity in Lake Eufaula.

C. Nutrient Controllability:

1. Point sources -

During the sampling year, point sources contributed 24.8% of the total phosphorus load to Lake Eufaula. The South Oklahoma City plant contributed 22.2% of the total load, the city of Okmulgee, 1.1%, and the remaining 15 municipal plants impacting the lake contributed about 1.5%.

The annual total phosphorus loading of 4.16 g $P/m^2/yr$ is about six times that proposed by Vollenweider (1975) as a "eutrophic" loading. Although elimination of all known point source contributions would not reduce this loading to Vollenweider's "eutrophic" level, it would reduce the high potential for occurrence of nuisance conditions which only appears to be held in check presently by the very limited light penetration.

2. Nonpoint sources -

Nonpoint sources were found to contribute 75.2% of the total phosphorus load to Lake Eufaula in the 1974 sampling

year. The North Canadian River contributed 36.8% of the total load, Deep Fork contributed 12.5%, the Canadian River, 18.6%, and ungaged drainage areas were estimated to contribute 6.6% of the total. Substantial unmeasured point source contributions are included in these calculated tributary loads. The Oklahoma Department of Pollution Control (1975a) reports that the North Canadian River below Oklahoma City is of low quality due to the introduction of municipal, industrial, and oilfield wastes, and that this degraded quality continues throughout the rest of the stream course. This agency further states (1975a,b) that the Deep Fork and Canadian River drainage areas are also of poor quality as they enter Lake Eufaula, primarily due to highly mineralized oilfield brines. Examination of current land use practices in the Eufaula drainage basin and measurement of additional point sources may provide answers to further nutrient reductions in the reservoir.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS

Lake and drainage basin characteristics are itemized below. Lake surface area and mean depth were provided by the Oklahoma Department of Pollution Control; maximum depth was provided by the Oklahoma Water Resources Board. Tributary flow data were provided by the Oklahoma District Office of the U.S. Geological Survey (USGS). Outlet drainage area includes the lake surface area. Mean hydraulic retention time was obtained by dividing the lake volume by mean flow of the outlet. Precipitation values are estimated by means as outlined in National Eutrophication Survey (NES) Working Paper No. 175. A table of metric/English conversions is included as Appendix A.

A. Lake Morphometry:

1. Surface area: 414.81 km^2.
2. Mean depth: 10.1 meters.
3. Maximum depth: 26.5 meters.
4. Volume: 4,189.581 x 10^6 m^3.
5. Mean hydraulic retention time: 309 days.

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

1. Tributaries -

Name	Drainage area(km^2)	Mean flow (m^3/sec)
A-2 Canadian River	59,961.1	51.10
C-1 Gaines Creek	336.7	3.18
G-1 North Canadian River	24,322.7	20.21
H-1 Deep Fork	5,327.6	23.17
Minor tributaries and immediate drainage -	7,596.1	84.07
Totals	97,544.2	181.73
2. Outlet - A-1 Canadian River	97,958.9	156.96

C. Precipitation:

1. Year of sampling: 141.7 cm.
2. Mean annual: 107.4 cm.

III. LAKE WATER QUALITY SUMMARY

Lake Eufaula was sampled four times during the open-water season of 1974 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from nine stations on the lake and from a number of depths at each station (see map, page v). During each visit, depth-integrated samples were collected from each station for chlorophyll a analysis and phytoplankton identification and enumeration. During the first and last visits, 18.9-liter depth-integrated samples were composited for algal assays. Maximum depths (expressed in meters) sampled are listed below:

Station Number	Maximum Depth
01	25.0
02	19.8
03	18.3
04	19.8
05	13.7
06	6.1
07	18.3
08	10.7
09	14.3

For a more detailed explanation of NES methods, see NES Working Paper No. 175.

The results obtained are presented in full in Appendix C and are summarized in III-A for waters at the surface and at the maximum depth for each site. Results of the phytoplankton counts and chlorophyll a determinations are included in III-B. Results of the limiting nutrient study are presented in III-C.

LAKE EUFAULA
STORET CODE 4004

PHYSICAL AND CHEMICAL CHARACTERISTICS

PARAMETER	(4/ 1/74) S*** = 9 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(6/13/74) S*** = 9 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)	(8/28/74) S*** = 9 N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)												
0.-1.5 M DEPTH	18	12.3- 15.4	13.9	0.0- 1.5	18	25.0- 26.9	25.8	0.0- 1.5	18	26.3- 76.8	26.8	0.0- 1.5
MAX DEPTH**	9	10.5- 14.6	12.2	4.6- 22.9	9	19.5- 24.6	23.8	6.1- 25.0	9	22.9- 27.7	25.8	3.4- 22.6
DISSOLVED OXYGEN (MG/L)												
0.-1.5 M DEPTH	9	9.0- 10.0	9.6	1.5- 1.5	18	5.8- 10.6	6.9	0.0- 1.5	18	4.0- 7.2	6.4	0.0- 1.5
MAX DEPTH**	9	8.8- 10.2	9.4	4.6- 22.9	9	1.8- 6.7	4.2	6.1- 25.0	9	0.8- 6.2	3.0	3.4- 22.6
CONDUCTIVITY (UMHOS)												
0.-1.5 M DEPTH	18	70.- 820.	315.	0.0- 1.5	18	81.- 642.	460.	0.0- 1.5	18	108.- 723.	409.	0.0- 1.5
MAX DEPTH**	9	69.- 778.	421.	4.6- 22.9	9	68.- 535.	412.	6.1- 25.0	9	110.- 725.	411.	3.4- 22.6
PH (STANDARD UNITS)												
0.-1.5 M DEPTH	18	6.9- 8.1	7.6	0.0- 1.5	18	7.3- 8.6	8.2	0.0- 1.5	18	7.2- 8.1	7.9	0.0- 1.5
MAX DEPTH**	9	6.9- 8.0	7.7	4.6- 22.9	9	6.9- 8.0	7.7	6.1- 25.0	9	7.0- 8.0	7.6	3.4- 22.6
TOTAL ALKALINITY (MG/L)												
0.-1.5 M DEPTH	18	15.- 173.	70.	0.0- 1.5	18	26.- 159.	92.	0.0- 1.5	19	33.- 131.	88.	0.0- 1.5
MAX DEPTH**	9	13.- 166.	86.	4.6- 22.9	9	26.- 112.	96.	6.1- 25.0	9	35.- 125.	93.	3.4- 22.6
TOTAL P (MG/L)												
0.-1.5 M DEPTH	18	0.040-0.138	0.073	0.0- 1.5	18	0.030-0.180	0.099	0.0- 1.5	19	0.033-0.187	0.096	0.0- 1.5
MAX DEPTH**	9	0.065-0.183	0.084	4.6- 22.9	9	0.063-0.340	0.085	6.1- 25.0	9	0.061-0.193	0.082	3.4- 22.6
DISSOLVED ORTHO P (MG/L)												
0.-1.5 M DEPTH	18	0.014-0.094	0.032	0.0- 1.5	18	0.006-0.108	0.025	0.0- 1.5	19	0.003-0.083	0.037	0.0- 1.5
MAX DEPTH**	9	0.026-0.088	0.040	4.6- 22.9	9	0.019-0.091	0.027	6.1- 25.0	9	0.014-0.086	0.044	3.4- 22.6
NO2+NO3 (MG/L)												
0.-1.5 M DEPTH	18	0.230-0.520	0.370	0.0- 1.5	18	0.060-0.650	0.390	0.0- 1.5	19	0.150-0.390	0.270	0.0- 1.5
MAX DEPTH**	9	0.270-0.560	0.380	4.6- 22.9	9	0.280-0.600	0.430	6.1- 25.0	9	0.120-0.410	0.350	3.4- 22.6
AMMONIA (MG/L)												
0.-1.5 M DEPTH	18	0.040-0.100	0.060	0.0- 1.5	18	0.030-0.140	0.040	0.0- 1.5	19	0.030-0.130	0.070	0.0- 1.5
MAX DEPTH**	9	0.050-0.130	0.060	4.6- 22.9	9	0.040-0.140	0.080	6.1- 25.0	9	0.040-0.430	0.070	3.4- 22.6
KJELDAHL N (MG/L)												
0.-1.5 M DEPTH	18	0.300-0.900	0.450	0.0- 1.5	18	0.400-1.200	0.600	0.0- 1.5	19	0.300-1.000	0.500	0.0- 1.5
MAX DEPTH**	9	0.300-0.800	0.400	4.6- 22.9	9	0.300-0.800	0.500	6.1- 25.0	9	0.200-0.700	0.400	3.4- 22.6
SECCHI DISC (METERS)												
	9	0.3- 0.5	0.5		9	0.2- 1.1	0.3		10	0.2- 0.6	0.3	

* N = NO. OF SAMPLES
** MAXIMUM DEPTH SAMPLED AT EACH SITE
*** S = NO. OF SITES SAMPLED ON THIS DATE

LAKE EUFAULA
STORET CODE 4004

PHYSICAL AND CHEMICAL CHARACTERISTICS

(10/22/74)

S*** = 9

PARAMETER	N*	RANGE	MEDIAN	MAX DEPTH RANGE (METERS)
TEMPERATURE (DEG CENT)				
0.-1.5 M DEPTH	18	17.6- 19.3	18.2	0.0- 1.5
MAX DEPTH**	9	17.4- 19.1	18.0	4.0- 22.2
DISSOLVED OXYGEN (MG/L)				
0.-1.5 M DEPTH	18	7.2- 9.0	8.2	0.0- 1.5
MAX DEPTH**	9	7.2- 9.0	8.0	4.0- 22.2
CONDUCTIVITY (UMHOS)				
0.-1.5 M DEPTH	18	51.- 557.	345.	0.0- 1.5
MAX DEPTH**	9	51.- 571.	343.	4.0- 22.2
PH (STANDARD UNITS)				
0.-1.5 M DEPTH	18	6.8- 8.3	7.8	0.0- 1.5
MAX DEPTH**	9	6.6- 8.3	7.6	4.0- 22.2
TOTAL ALKALINITY (MG/L)				
0.-1.5 M DEPTH	18	15.- 120.	88.	0.0- 1.5
MAX DEPTH**	9	16.- 104.	81.	4.0- 22.2
TOTAL P (MG/L)				
0.-1.5 M DEPTH	18	0.032-0.120	0.070	0.0- 1.5
MAX DEPTH**	9	0.038-0.362	0.100	4.0- 22.2
DISSOLVED ORTHO P (MG/L)				
0.-1.5 M DEPTH	18	0.010-0.084	0.021	0.0- 1.5
MAX DEPTH**	9	0.012-0.076	0.021	4.0- 22.2
NO2+NO3 (MG/L)				
0.-1.5 M DEPTH	18	0.140-0.360	0.290	0.0- 1.5
MAX DEPTH**	9	0.200-0.360	0.310	4.0- 22.2
AMMONIA (MG/L)				
0.-1.5 M DEPTH	18	0.020-0.070	0.040	0.0- 1.5
MAX DEPTH**	9	0.020-0.060	0.040	4.0- 22.2
KJELDAHL N (MG/L)				
0.-1.5 M DEPTH	16	0.300-0.800	0.550	0.0- 1.5
MAX DEPTH**	9	0.300-0.700	0.400	4.0- 22.2
SECCHI DISC (METERS)				
	9	0.3- 0.8	0.6	

* N = NO. OF SAMPLES
** MAXIMUM DEPTH SAMPLED AT EACH SITE
*** S = NO. OF SITES SAMPLED ON THIS DATE

B. Biological Characteristics:

1. Phytoplankton -

Sampling Date	Dominant Genera		Algal Units per ml
04/01/74	1.	Chroomonas	355
	2.	Scenedesmus	355
	3.	Cyclotella	133
	4.	Ankistrodesmus	89
	5.	Skeletonema	89
		Other genera	532
		Total	1,553
06/13/74	1.	Chroomonas	351
	2.	Stephanodiscus	292
	3.	Cryptomonas	263
	4.	Chlamydomonas	88
	5.	Carteria	58
		Other genera	321
		Total	1,373
08/28/74	1.	Melosira	1,097
	2.	Stephanodiscus	240
	3.	Chroomonas	206
	4.	Anabaena	69
	5.	Schroederia	69
		Other genera	306
		Total	1,987
10/22/74	1.	Chroomonas	817
	2.	Chlamydomonas	371
	3.	Centric diatom	297
	4.	Cryptomonas	223
	5.	Melosira	99
		Other genera	49
		Total	1,856

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (µg/l)
04/01/74	01	1.8
	02	1.5
	03	2.1
	04	1.6
	05	1.7
	06	12.3
	07	4.8
	08	13.6
	09	7.5
06/13/74	01	2.8
	02	2.5
	03	4.8
	04	1.2
	05	0.9
	06	1.6
	07	1.2
	08	2.0
	09	1.8
08/28/74	01	4.2
	02	4.7
	03	7.5
	04	2.1
	05	2.0
	06	3.3
	07	5.2
	08	8.0
	09	2.0
10/22/74	01	1.8
	02	3.2
	03	3.4
	04	2.3
	05	4.2
	06	25.4
	07	4.6
	08	5.8
	09	2.4

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.)
a. 04/01/74 - Stations 01-03			
Control	0.035	0.361	9.3
0.05 P	0.085	0.361	9.6
0.05 P + 1.0 N	0.085	1.361	31.4
1.00 N	0.035	1.361	12.1
Stations 04-06			
Control	0.030	0.425	6.9
0.05 P	0.080	0.425	10.8
0.05 P + 1.0 N	0.080	1.425	26.1
1.00 N	0.030	1.425	10.6
Stations 07-09			
Control	0.050	0.420	13.2
0.05 P	0.100	0.420	14.4
0.05 P + 1.0 N	0.100	1.420	29.1
1.00 N	0.050	1.420	20.1
b. 10/22/74 - Stations 01-04			
Control	0.013	0.199	1.1
0.05 P	0.063	0.199	4.8
0.05 P + 1.0 N	0.063	1.199	20.6
1.00 N	0.013	1.199	1.2
Stations 05,06			
Control	0.020	0.176	3.1
0.05 P	0.070	0.176	6.4
0.05 P + 1.0 N	0.070	1.176	23.0
1.00 N	0.020	1.176	3.4

Spike(mg/l)	Ortho P Conc.(mg/l)	Inorganic N Conc.(mg/l)	Maximum Yield (mg/l-dry wt.)
b. 10/22/74 (cont.) - Stations 07-09			
Control	0.021	0.104	2.6
0.05 P	0.071	0.104	3.0
0.05 P + 1.0 N	0.071	1.104	20.6
1.00 N	0.021	1.104	9.0

2. Discussion -

The control yields of the assay alga, Selenastrum capricornutum, indicates that the potential primary productivity in Lake Eufaula was extremely high at the time of spring sampling (04/01/74) and high during fall (10/22/74). In the spring assays for Stations 01-03 and 07-09, and the fall assay for Stations 07-09, there was a significant increase in yield over that of the control when nitrogen was added, indicating nitrogen limitation. In the spring, Stations 04-06 assay, significant response accompanied the addition of both phosphorus and nitrogen alone, suggesting near colimitation by the two nutrients. In the fall assays for Stations 01-06, phosphorus appeared to be the growth limiting nutrient. In all the assays, the simultaneous addition of both phosphorus and nitrogen resulted in maximum increases in yield.

The mean inorganic nitrogen to orthophosphorus (N/P) ratios in the lake data were 13/1 or less on all sampling occasions, suggesting primary limitation by nitrogen in Lake Eufaula (a mean N/P ratio of 14/1 or greater generally reflects phosphorus limitation).

IV. NUTRIENT LOADINGS
(See Appendix D for data)

For the determination of nutrient loadings, the Oklahoma National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page v), except for the high runoff months of April and May when two samples were collected at some tributary sites. Sampling was begun in November 1974, and was completed in October 1975.

Through an interagency agreement, stream flow estimates for the year of sampling an a "normalized" or average year were provided by the Oklahoma District Office of the USGS for the tributary sites nearest the lake.

In this report, nutrient loads for sampled tributaries were determined by using a modification of a USGS computer program for calculating stream loadings. Nutrient loads indicated for tributaries are those measured minus known point source loads, if any.

Nutrient loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of USGS) were estimated by using the mean annual nutrient loads, in $kg/km^2/yr$, in Gaines Creek at Station C-1, and multiplying the means by the ZZ area in km^2.

The operators of the N.A.D. McAlester, McAlester, Haileyville, Henryetta, Okmulgee, and South Oklahoma City wastewater treatment plants provided monthly effluent samples and corresponding flow data. Nutrient loads for the remaining wastewater treatment plants were estimated at 1.134 kg P and 3.401 kg N/capita/yr.

A. Waste Sources:

1. Known municipal -

Name	Population Served*	Treatment*	Mean Flow ($m^3/d \times 10^3$)	Receiving Water
N.A.D. McAlester	3,000†	1.	1.031	Gaines Creek
McAlester	20,000	1.	3.441	Deer Creek/Coal Creek
Haileyville	1,250	2.	0.080	Brushy Creek
Eufaula	2,750	1.	1.041**	Eufaula Lake
Oklahoma State Penitentiary	1,300	Unknown	0.492**	Deer Creek/Coal Creek
Krebs	1,350	2.	0.511**	Mud Creek/Brushy Creek
Hartshorne	1,000	1.	0.378**	Blue Creek/Brushy Creek
U.S. Navy Ammunition Depot	100†	1.	0.038**	Peaceable Creek/Brushy Creek
Savannah	500	2.	0.189**	Peaceable Creek/Brushy Creek
Dewar	500	2.	0.189**	Coal Creek/Deep Fork
Henryetta	7,000	1.	2.129	Coal Creek/Deep Fork
Morris South	288	2.	0.109**	Deep Fork
Morris N.W.	863	2.	0.327**	Cosseetta Creek/Deep Fork
Okmulgee	17,000	3.	6.303	Okmulgee Creek/Deep Fork
South Oklahoma City	300,000	1.	109.903	Canadian River
Pittsburg	195	4.	0.074**	Chumm Creek/Peaceable Creek/Brushy Creek
Dustin	100	2.	0.038**	Fish Creek

2. Known industrial - See †.

Key: 1. Trickling filter
2. Stabilization pond
3. Activated sludge
4. Imhoff

*Treatment plant questionnaires; U.S.EPA, 1971.
**Estimated at 0.3785 m^3/capita/day.
†More than 25% of the total waste loads to N.A.D. McAlester and the U.S. Navy Ammunition Depot are contributed by ammunition manufacturing wastes.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/yr	% of total
a. Tributaries (nonpoint load) -		
A-2 Canadian River	320,495	18.6
C-1 Gaines River	4,970	0.3
G-1 North Canadian River	635,120	36.8
H-1 Deep Fork	215,355	12.5
b. Minor tributaries and immediate drainage (nonpoint load) -	113,940	6.6
c. Known municipal STP's -		
N.A.D. McAlester	535	<0.1
McAlester	9,065	0.5
Haileyville	95	<0.1
Eufaula	3,120	0.2
Oklahoma State Penitentiary	1,475	0.1
Krebs	1,530	0.1
Hartshorne	1,135	0.1
U.S. Navy Depot	115	<0.1
Savannah	565	<0.1
Dewar	565	<0.1
Henryetta	7,460	0.4
Morris South	325	<0.1
Morris N.W.	980	0.1
Okmulgee	19,425	1.1
South Oklahoma City	383,030	22.2
Pittsburg	220	<0.1
Dustin	115	<0.1
d. Septic tanks* -	10	<0.1
e. Known industrial - See †, page 13.		
f. Direct precipitation** -	7,260	0.4
Totals	1,726,905	100.0

2. Output - A-1 Canadian River 1,084,280

3. Net annual P accumulation - 642,625

*Estimate based on 25 lakeshore residences and 1 park.
**Estimated (see NES Working Paper No. 175).

C. Annual Total Nitrogen Loading - Average Year:

1. Inputs -

Source	kg N/yr	% of total
a. Tributaries (nonpoint load) -		
A-2 Canadian River	4,196,980	37.4
C-1 Gaines Creek	86,120	0.8
G-1 North Canadian River	2,159,175	19.3
H-1 Deep Fork	1,514,930	13.5
b. Minor tributaries and immediate drainage (nonpoint load) -	1,944,600	17.3
c. Known municipal STP's -		
N.A.D. McAlester	2,380	<0.1
McAlester	22,765	0.2
Haileyville	235	<0.1
Eufaula	9,355	0.1
Oklahoma State Penitentiary	4,420	<0.1
Krebs	4,590	<0.1
Hartshorne	3,400	<0.1
U.S. Navy Depot	340	<0.1
Savannah	1,700	<0.1
Dewar	1,700	<0.1
Henryetta	24,590	0.2
Morris South	980	<0.1
Morris N.W.	2,935	<0.1
Okmulgee	41,715	0.4
South Oklahoma City	746,175	6.7
Pittsburg	665	<0.1
Dustin	340	<0.1
d. Septic tanks* -	270	<0.1
e. Known industrial - See †, page 13.		
f. Direct precipitation** -	447,830	4.0
Totals	11,218,190	100.0

2. Output - A-1 Canadian River 10,392,320

3. Net annual N accumulation - 825,870

*Estimate based on 25 lakeshore residences and 1 park.
**Estimated (see NES Working Paper No. 175).

D. Mean Annual Nonpoint Nutrient Export by Subdrainage Area:

Tributary	kg P/km^2/yr	kg N/km^2/yr
Canadian River	5	70
Gaines Creek	15	256
North Canadian River	26	89
Deep Fork	40	284

E. Mean Nutrient Concentrations in Ungaged Streams:

Tributary	Mean Total P (mg/l)	Mean Total N (mg/l)
B-1 Longtown Creek	0.025	0.909
D-1 Brushy Creek	0.245	1.207
E-1 Coal Creek	0.104	1.538
F-1 Mill Creek	0.080	1.694

Nutrient levels in tributaries D-1, E-1, and F-1 are all substantially higher than those in the unimpacted tributaries to Lake Eufaula. The inflated nutrient concentrations in Brushy Creek, D-1, are probably due to sewage treatment facility impact from the Pittsburg, Savannah, the U.S. Navy Ammunition Depot, Hartshorne, and Haileyville plants. Coal Creek, E-1, receives effluent from the McAlester and Oklahoma State Penitentiary plants.

F. Yearly Loadings:

In the following table, the existing phosphorus annual loading is compared to the relationship proposed by Vollenweider (1975). Essentially, his "eutrophic" loading is that at which the receiving waters would become eutrophic or remain eutrophic; his "oligotrophic" loading is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A "mesotrophic" loading would be considered one between "eutrophic" and "oligotrophic".

Note that Vollenweider's model may not be applicable to water bodies with very short retention times or in which light penetration is severely restricted from high concentrations of suspended solids in the surface waters.

	Total Yearly Phosphorus Loading ($g/m^2/yr$)
Estimated loading for Lake Eufaula	4.16
Vollenweider's "eutrophic" loading	0.67
Vollenweider's "oligotrophic" loading	0.33

IV. LITERATURE REVIEWED

U.S. Environmental Protection Agency. 1971. "Inventory of Wastewater Treatment Facilities." EPA Publication No. OWP-1, Volume 6. Office of Media Programs, Office of Water Programs, Washington, D.C.

U.S. Environmental Protection Agency. 1975. National Eutrophication Survey Methods 1973-1976. Working Paper No. 175. National Environmental Research Center, Las Vegas, Nevada, and Pacific Northwest Environmental Research Laboratory, Corvallis, Oregon.

Vollenweider, R. A. 1975. Input-Output Models With Special Reference to the Phosphorus Loading Concept in Limnology. Schweiz. Z. Hydrol. 37:53-84.

VI. APPENDICES

APPENDIX A

CONVERSION FACTORS

CONVERSION FACTORS

Hectares x 2.471 = acres

Kilometers x 0.6214 = miles

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

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR OKLAHOMA 03/25/77

LAKE CODE 4004 LAKE EUFAULA

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 97958.9

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
4004A1	97958.9	66.83	146.68	182.93	267.03	450.24	259.10	133.37	33.70	86.08	86.37	84.67	87.78	156.96
4004A2	59961.1	15.66	23.25	31.15	63.71	132.81	105.90	59.47	35.68	45.31	55.50	23.30	19.91	51.10
4004C1	336.7	2.10	3.17	4.50	5.78	8.55	3.06	2.32	0.74	1.95	2.15	1.93	1.87	3.18
4004G1	24322.7	6.94	10.08	14.58	29.73	50.12	45.02	23.22	11.13	12.71	17.98	12.74	7.87	20.21
4004H1	5327.6	6.14	9.34	17.39	45.59	67.96	52.10	23.28	7.79	10.28	17.24	13.42	7.08	23.17
4004ZZ	8010.9	50.12	111.00	135.64	148.66	218.89	90.61	61.73	15.01	44.17	28.88	46.16	60.31	84.07

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 97958.9
SUM OF SUB-DRAINAGE AREAS = 97958.9
TOTAL FLOW IN = 2180.70
TOTAL FLOW OUT = 1884.77

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4004A1	11	74	620.139	2	342.634				
	12	74	231.349	14	230.499				
	1	75	219.739	18	186.608				
	2	75	300.158	16	229.366				
	3	75	498.376	9	410.594				
	4	75	368.119						
	5	75	470.060						
	6	75	484.218						
	7	75	127.709						
	8	75	142.151	25	209.828				
	9	75	59.749						
	10	75	84.951	16	50.970				
4004A2	11	74	114.117	3	171.883				
	12	74	19.822	7	21.238				
	1	75	26.618	21	18.123				
	2	75	94.012	13	37.378				
	3	75	95.711	10	33.980				
	4	75	76.455	4	45.307	28	197.652		
	5	75	164.804	5	73.341				
	6	75	127.709	29	58.899				
	7	75	64.562	7	13.592				
	8	75	22.087	6	41.343				
	9	75	7.079	11	7.362				
	10	75	3.681	16	2.577				

TRIBUTARY FLOW INFORMATION FOR OKLAHOMA 03/25/77

LAKE CODE 4004 LAKE EUFAULA

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4004C1	11	74	17.840	3	35.962				
	12	74	4.531	14	4.814				
	1	75	5.097	11	1.841				
	2	75	15.857	28	0.011				
	3	75	11.044	24	0.037				
	4	75	7.646	4	42.475				
	5	75	7.929	18	0.085				
	6	75	10.194	21	7.362				
	7	75	0.680	30	0.263				
	8	75	0.127	5	0.062				
	9	75	0.425						
	10	75	0.595	19	0.198				
4004G1	11	74	90.897	2	172.166				
	12	74	20.105	14	25.004				
	1	75	20.954	18	14.725				
	2	75	39.077	15	20.105				
	3	75	51.253	22	43.325				
	4	75	31.149						
	5	75	63.147	19	27.467	31	56.917		
	6	75	62.297	21	0.0				
	7	75	22.937	17	11.327				
	8	75	25.485	22	15.574				
	9	75	8.495	5	7.929				
	10	75	5.663	18	5.380				
4004H1	11	74	242.109	2	236.163				
	12	74	21.804	20	20.105				
	1	75	22.937	23	12.459				
	2	75	73.341	21	26.051				
	3	75	75.606	25	63.147				
	4	75	64.846	21	22.484	24	17.981		
	5	75	131.673	20	107.604	23	129.691		
	6	75	95.428	17	107.038				
	7	75	16.565						
	8	75	22.965						
	9	75	3.455	29	3.681				
	10	75	1.699	24	3.256				
4004ZZ	11	74	424.753						
	12	74	110.436						
	1	75	121.762						
	2	75	368.119						
	3	75	260.515						
	4	75	184.060						
	5	75	186.891						
	6	75	243.525						
	7	75	15.857						
	8	75	3.115						
	9	75	10.194						
	10	75	1.416						

APPENDIX C

PHYSICAL AND CHEMICAL DATA

STORET RETRIEVAL DATE 77/03/24

400401
35 18 28.0 095 21 34.0 3
LAKE EUFAULA
40091 OKLAHOMA

101392

/TYPA/AMBNT/LAKE

11EPALES 04001002
0080 FEET DEPTH CLASS 00

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
74/04/01	14	15 0000	12.4		20	275	7.65	70	0.050	0.400	0.380	0.050
	14	15 0005	12.4	10.0		276	7.60	65	0.050	0.300	0.370	0.043
	14	15 0015	12.3	9.8		275	7.50	65	0.050	0.300	0.370	0.041
	14	15 0040	12.3	10.0		274	7.50	64	0.040	0.300	0.360	0.040
	14	15 0075	11.9	10.2		268	7.50	64	0.050	0.300	0.370	0.040
74/06/13	14	00 0000	26.3	9.2	42	465	7.80	92	0.040	0.600	0.330	0.026
	14	00 0005	25.1	7.8		455	7.80	92	0.030	0.400	0.300	0.022
	14	00 0015	24.2	7.4		450	7.80	91	0.030	0.400	0.310	0.023
	14	00 0035	23.9	6.8		446	7.80	92	0.030	0.400	0.340	0.031
	14	00 0060	23.6	6.6		441	7.70	92	0.030	0.400	0.360	0.031
	14	00 0082	19.5	3.4		412	7.50	96	0.040	0.500	0.420	0.029
74/08/28	11	25 0000	26.3	6.0	23	415	7.90	88	0.070	0.800	0.270	0.016
	11	25 0005	26.3	6.4		414	7.90	86	0.030	0.400	0.260	0.015
	11	25 0015	26.2	5.8		416	7.90	87	0.020	0.300	0.260	0.014
	11	25 0040	26.2	3.6		420	7.90	88	0.030	0.300	0.260	0.015
	11	25 0060	24.5	0.8		421	7.60	94	0.040	0.400	0.340	0.029
	11	25 0074	22.9	1.0		425	7.50	103	0.270	0.600	0.120	0.049
74/10/22	11	25 0000	19.3	7.4	32	345	7.65	90	0.040	0.600	0.290	0.025
	11	25 0005	19.3	7.6		345	7.65	86	0.020K	0.400	0.290	0.022
	11	25 0015	19.2	7.6		345	7.63	84	0.020	0.300	0.280	0.023
	11	25 0030	19.2	7.6		345	7.63	83	0.030	0.300	0.280	0.021
	11	25 0050	19.2	7.6		343	7.61	82	0.020	0.400	0.290	0.020
	11	25 0073	19.1	7.2		343	7.61	81	0.020K	0.300	0.290	0.021

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 77/03/24

400401
35 16 28.0 095 21 34.0 3
LAKE EUFAULA
40071 OKLAHOMA

101392

/TYPA/AMBNT/LAKE

11EPALES 04001002
0080 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/04/01	14	15 0000	0.063	1.8	
	14	15 0005	0.058		
	14	15 0015	0.073		
	14	15 0040	0.064		
	14	15 0075	0.067		
74/06/13	14	00 0000	0.055	2.8	
	14	00 0005	0.040		
	14	00 0008			1.0
	14	00 0015	0.042		
	14	00 0035	0.046		
	14	00 0060	0.049		
	14	00 0082	0.080		
74/08/28	11	25 0000	0.051	4.2	
	11	25 0005	0.043		
	11	25 0006			1.0
	11	25 0015	0.042		
	11	25 0040	0.041		
	11	25 0060	0.063		
	11	25 0074	0.081		
74/10/22	11	25 0000	0.042	1.8	
	11	25 0005	0.038		
	11	25 0006			1.0
	11	25 0015	0.037		
	11	25 0030	0.038		
	11	25 0050	0.038		
	11	25 0073	0.038		

STORET RETRIEVAL DATE 77/03/24

400402
35 18 01.0 095 30 11.0 3
LAKE EUFAULA
40121 OKLAHOMA
100692

/TYPA/AMBNT/LAKE

11EPALES 04001002
0071 FEET DEPTH CLASS 00

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
74/04/01	14	45 0000	12.7		20	316	7.60	69	0.050	0.400	0.370	0.043
	14	45 0005	12.3	9.6		314	7.60	69	0.050	0.300	0.380	0.042
	14	45 0015	12.1	9.6		318	7.60	69	0.060	0.300	0.390	0.043
	14	45 0045	10.6	9.4		286	7.55	67	0.050	0.300	0.390	0.044
	14	45 0065	10.5	10.0		285	7.60	66	0.050	0.300	0.390	0.043
74/06/13	14	50 0000	26.9	9.4	18	473	8.20	91	0.060	0.800	0.300	0.025
	14	50 0005	26.7	9.2		469	8.20	91	0.040	0.600	0.280	0.021
	14	50 0015	25.3	7.8		480	8.20	94	0.050	0.500	0.370	0.028
	14	50 0030	24.0	7.0		520	7.90	100	0.030	0.500	0.380	0.033
	14	50 0065	22.8	5.8		444	7.80	92	0.050	0.500	0.430	0.027
74/08/28	10	55 0000	26.8	6.8	22	409	8.10	85	0.060	0.600	0.230	0.012
	10	55 0005	26.8	6.8		409	8.10	85	0.060	0.300	0.220	0.011
	10	55 0015	26.7	6.6		409	8.10	83	0.040	0.300	0.210	0.011
	10	55 0030	26.7	6.6		409	8.10	85	0.030	0.300	0.200	0.011
	10	55 0045	25.4	6.0		402	7.80	86	0.030	0.400	0.360	0.025
	10	55 0062	24.3	1.4		411	7.60	92	0.100	0.400	0.310	0.021
74/10/22	11	10 0000	19.3	8.4	32	343	7.83	89	0.030	0.300	0.280	0.021
	11	10 0005	19.3	8.0		343	7.83	90	0.030	0.300	0.280	0.021
	11	10 0020	19.3	8.2		343	7.81	92	0.030	0.400	0.280	0.021
	11	10 0040	19.3	8.0		343	7.79	93	0.030	0.400	0.290	0.022
	11	10 0055	18.9	8.0		343	7.67	88	0.060	0.400	0.330	0.025
	11	10 0063	18.8	7.4		341	7.63	88	0.030	0.400	0.320	0.024

STORET RETRIEVAL DATE 77/03/24

400402
35 18 01.0 095 30 11.0 3
LAKE EUFAULA
40121 OKLAHOMA

100892

/TYPA/AM-NT/...

11EPALES 04001002
0071 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/04/01	14 45	0000	0.056	1.5	
	14 45	0005	0.061		
	14 45	0015	0.070		
	14 45	0045	0.063		
	14 45	0065	0.071		
74/06/13	14 50	0000	0.052	2.5	
	14 50	0005	0.052		1.0
	14 50	0015	0.057		
	14 50	0030	0.057		
	14 50	0065	0.060		
74/08/28	10 55	0000	0.046	4.7	
	10 55	0005	0.044		
	10 55	0007			1.0
	10 55	0015	0.043		
	10 55	0030	0.046		
	10 55	0045	0.062		
	10 55	0062	0.064		
74/10/22	11 10	0000	0.044	3.2	
	11 10	0005	0.044		
	11 10	0006			1.0
	11 10	0020	0.065		
	11 10	0040	0.045		
	11 10	0055	0.053		
	11 10	0063	0.062		

STORET RETRIEVAL DATE 77/03/24

400403
35 14 15.0 095 30 19.0 3
LAKE EUFAULA
40121 OKLAHOMA

101391

/TYPA/AMBNT/LAKE

11EPALES 04001002
0061 FEET DEPTH CLASS 00

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
74/04/01	15	20 0000	14.3		20	240	7.60	55	0.040	0.400	0.280	0.022
	15	20 0005	14.0	9.6		239	7.60	56	0.040	0.400	0.290	0.026
	15	20 0015	13.2	9.6		230	7.60	55	0.050	0.400	0.290	0.029
	15	20 0030	12.9	9.4		238	7.60	63	0.050	0.400	0.330	0.029
	15	20 0055	11.2	9.8		299	7.60	75	0.060	0.400	0.390	0.041
74/06/13	15	55 0000	26.8	10.6	36	379	8.50	81	0.040	1.200	0.090	0.006
	15	55 0005	26.7	10.6		376	8.60	79	0.030	0.700	0.060	0.006
	15	55 0015	24.6	7.2		365	8.40	73	0.040	0.200	0.260	0.009
	15	55 0030	24.0	6.6		382	8.20	78	0.040	0.200	0.390	0.020
	15	55 0045	23.7	6.4		380	7.90	78	0.040	0.200	0.420	0.022
	15	55 0060	22.1	2.4		380	7.70	82	0.040	0.300	0.410	0.019
74/08/28	10	20 0000	26.8	6.2	24	381	7.90	88	0.070	0.800	0.150	0.005
	10	20 0005	26.8	6.6		382	7.90	88	0.130	0.400	0.150	0.003
	10	20 0015	26.7	6.4		383	7.90	88	0.030	0.300	0.140	0.006
	10	20 0025	26.3	4.2		385	7.75	80	0.040	0.200	0.280	0.013
	10	20 0040	25.6	2.6		383	7.60	83	0.060	0.300	0.360	0.015
	10	20 0054	25.4	1.6		382	7.50	85	0.080	0.300	0.350	0.015
74/10/22	10	40 0000	18.5	8.0	22	289	7.64	78	0.050	0.500	0.200	0.011
	10	40 0005	18.5	7.2		289	7.63	78	0.060	0.400	0.200	0.010
	10	40 0020	18.5	8.0		291	7.63	79	0.030	0.400	0.200	0.011
	10	40 0040	18.4	7.8		291	7.61	79	0.030	0.300	0.200	0.010
	10	40 0059	18.4	8.0		305	7.59	79	0.030	0.300	0.200	0.012

STORET RETRIEVAL DATE 77/03/24

400403
35 14 15.0 095 30 19.0 3
LAKE EUFAULA
40121 OKLAHOMA

101391

/TYPA/AMBNT/LAKE

11EPALES 04001002
0061 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCUT LT REMNING PERCENT
74/04/01	15	20 0000	0.057	2.1	
	15	20 0005	0.057		
	15	20 0015	0.054		
	15	20 0030	0.067		
	15	20 0055	0.065		
74/06/13	15	55 0000	0.030	4.8	
	15	55 0005	0.040		
	15	55 0015	0.049		
	15	55 0030	0.076		
	15	55 0045	0.078		
	15	55 0060	0.085		
74/08/28	10	20 0000	0.042	7.5	
	10	20 0005	0.033		
	10	20 0007			1.0
	10	20 0015	0.039		
	10	20 0025	0.053		
	10	20 0040	0.063		
	10	20 0054	0.071		
74/10/22	10	40 0000	0.036	3.4	
	10	40 0001			50.0
	10	40 0005	0.032		
	10	40 0006			1.0
	10	40 0020	0.035		
	10	40 0040	0.039		
	10	40 0059	0.044		

STORET RETRIEVAL DATE 77/03/24

400404
35 10 06.0 095 35 57.0 3
LAKE EUFAULA
40121 OKLAHOMA

101391

/TYPA/AMBNT/LAKE

11EPALES 04001002
0065 FEET DEPTH CLASS 00

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
74/04/01	11	15 0000	14.4		13	119	7.30	24	0.070	0.400	0.350	0.025
	11	15 0005	14.3	9.4		120	7.30	23	0.070	0.300	0.350	0.026
	11	15 0015	14.0	9.2		133	6.90	37	0.070	0.400	0.340	0.030
	11	15 0045	11.9	9.2		413	7.70	104	0.100	0.300	0.330	0.031
	11	15 0060	11.6	9.2		444	7.70	112	0.100	0.400	0.340	0.031
74/06/13	10	30 0000	25.9	7.4	12	182	8.20	39	0.090	0.600	0.480	0.022
	10	30 0005	25.7	7.4		188	8.10	39	0.120	0.500	0.430	0.025
	10	30 0015	24.5	7.0		181	7.90	41	0.060	0.400	0.440	0.021
	10	30 0030	24.3	6.8		387	7.80	81	0.040	0.300	0.450	0.022
	10	30 0045	24.1	7.2		432	7.80	90	0.030	0.400	0.440	0.023
	10	30 0065	24.0	6.2		477	7.70	98	0.070	0.400	0.460	0.022
74/08/27	11	00 0000			12			48	0.080	0.500	0.330	0.076
	11	00 0015	27.0			194						
	11	00 0030	26.0	3.8		287		67	0.050	1.100	0.350	0.094
	11	00 0045	25.7	3.0		386		88	0.040	0.400	0.330	0.089
	11	00 0060	25.7	3.0		397		90	0.040	0.300	0.330	0.083
74/08/28	09	50 0000	26.7	6.4	9	196	7.70	53	0.100	1.000	0.370	0.016
	09	50 0005	26.7	6.4		196	7.70	52	0.070	0.300	0.360	0.013
	09	50 0015	26.7	6.2		194	7.70	51	0.150	0.200	0.360	0.013
	09	50 0025	26.7	6.0		222	7.70	55	0.110	0.200	0.370	0.014
	09	50 0040	25.9	2.0		389	7.60	87	0.040	0.200	0.340	0.015
	09	50 0060	25.8	3.0		399	7.60	93	0.070	0.200	0.350	0.014
74/10/22	10	15 0000	18.1	8.2	12	115	7.15	35	0.070	0.600	0.350	0.017
	10	15 0005	18.1	8.0		113	7.17	39	0.060	0.400	0.350	0.017
	10	15 0020	18.0	8.0		111	7.13	38	0.050	0.300	0.360	0.018
	10	15 0040	18.0	8.0		113	7.11	38	0.080	0.400	0.360	0.016
	10	15 0059	18.0	8.2		99	7.07	37	0.060	0.500	0.340	0.018

STORET RETRIEVAL DATE 77/03/24

400404
35 10 06.0 095 35 57.0 3
LAKE EUFAULA
40121 OKLAHOMA

101391

/TYPA/AMBNT/LAKE

11EPALES 04001002
0065 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/04/01	11	15 0000	0.085	1.6	
	11	15 0005	0.084		
	11	15 0015	0.076		
	11	15 0045	0.056		
	11	15 0060	0.068		
74/06/13	10	30 0000	0.113	1.2	
	10	30 0002			1.0
	10	30 0005	0.108		
	10	30 0015	0.109		
	10	30 0030	0.075		
	10	30 0045	0.065		
	10	30 0065	0.063		
74/08/27	11	00 0000	0.157		
	11	00 0002			1.0
	11	00 0030	0.134		
	11	00 0045	0.124		
	11	00 0060	0.134		
74/08/28	09	50 0000	0.096	2.1	
	09	50 0002			1.0
	09	50 0005	0.087		
	09	50 0015	0.086		
	09	50 0025	0.083		
	09	50 0040	0.061		
	09	50 0060	0.061		
74/10/22	10	15 0000	0.097	2.3	
	10	15 0002			1.0
	10	15 0005	0.092		
	10	15 0020	0.095		
	10	15 0040	0.094		
	10	15 0059	0.140		

STORET RETRIEVAL DATE 77/03/24

400405
35 03 11.0 095 39 40.0 3
LAKE EUFAULA
40121 OKLAHOMA

100991

/TYPA/AMBNT/LAKE

11EPALES 04001002
0051 FEET DEPTH CLASS 00

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
74/04/01	10	45 0000	13.6		10	70	7.05	15	0.080	0.900	0.370	0.023
	10	45 0005	13.6	9.2		70	6.90	16	0.100	0.500	0.390	0.038
	10	45 0015	13.6	9.4		70	6.90	13	0.100	0.500	0.390	0.033
	10	45 0030	13.5	9.2		70	6.90	12	0.100	0.500	0.390	0.027
	10	45 0045	13.2	9.2		69	6.90	13	0.100	0.500	0.380	0.026
74/06/12	15	40 0000	25.6	6.4	7	84	8.50	28	0.090	0.800	0.320	0.019
	15	40 0005	25.2	6.4		81	8.35	26	0.140	0.500	0.400	0.019
	15	40 0015	24.2	6.4		79	8.30	25	0.090	0.500	0.400	0.019
	15	40 0030	23.8	5.0		78	8.10	25	0.130	0.600	0.440	0.018
	15	40 0045	23.2	3.8		68	8.00	26	0.130	0.700	0.370	0.019
74/08/27	10	25 0000	26.7	4.0	12	108	7.20	33	0.060	0.500	0.320	0.083
	10	25 0005	26.7	6.4		108	7.20	33	0.060	0.400	0.360	0.075
	10	25 0015	26.8	6.4		109	7.30	33	0.070	0.400	0.380	0.080
	10	25 0035	25.8	3.6		110	7.00	35	0.040	0.400	0.390	0.086
74/10/21	15	45 0000	18.2	8.4	10	51	6.77	15	0.060	0.700	0.260	0.013
	15	45 0005	18.2	8.2		53	6.75	17	0.040	0.400	0.270	0.013
	15	45 0016	17.9	7.8		51	6.65	16	0.040	0.400	0.260	0.014

STORET RETRIEVAL DATE 77/03/24

400405
35 03 11.0 095 39 40.0 3
LAKE EUFAULA
40121 OKLAHOMA
100991

/TYPA/AMBNT/LAKE

11EPALES 04001002
0051 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCUT LT REMNING PERCENT
74/04/01	10 45	0000	0.100	1.7	
	10 45	0005	0.104		
	10 45	0015	0.111		
	10 45	0030	0.096		
	10 45	0045	0.113		
74/06/12	15 40	0000	0.136	0.9	
	15 40	0002			1.0
	15 40	0005	0.111		
	15 40	0015	0.113		
	15 40	0030	0.116		
	15 40	0045	0.124		
74/08/27	10 25	0000	0.186	2.0	
	10 25	0005	0.187		
	10 25	0015	0.191		
	10 25	0035	0.193		
74/10/21	15 45	0000	0.105	4.2	
	15 45	0002			1.0
	15 45	0005	0.097		
	15 45	0016	0.100		

STORET RETRIEVAL DATE 77/03/24

400406
35 11 40.0 095 44 30.0 4
LAKE EUFAULA
40121 OKLAHOMA

101391

/TYPA/AMBNT/LAKE

11EPALES 04001002
0020 FEET DEPTH CLASS 00

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
74/04/01	11	30 0000	15.3		14	820	8.10	172	0.070	0.600	0.240	0.026
	11	30 0005	15.2	9.0		817	8.10	173	0.060	0.700	0.230	0.025
	11	30 0015	14.6	8.8		778	8.00	166	0.100	0.700	0.270	0.031
74/06/13	11	10 0000	25.7	6.2	12	418	7.70	99	0.040	0.600	0.400	0.029
	11	10 0005	25.5	6.0		384	7.70	89	0.080	0.600	0.370	0.028
	11	10 0015	25.0	5.2		369	7.70	89	0.110	0.600	0.290	0.031
	11	10 0020	24.1	4.2		332	6.90	96	0.140	0.700	0.280	0.026
74/08/27	09	50 0000	27.7	6.4	18	510	7.90	105	0.090	0.700	0.180	0.075
	09	50 0005	27.7	6.6		511	8.00	106	0.090	0.400	0.190	0.071
	09	50 0011	27.7	6.8		512	7.90	105	0.070	0.400	0.180	0.067
74/10/21	16	20 0000	18.2	9.0	12	553	8.33	118	0.030	0.700	0.170	0.012
	16	20 0005	18.2	9.0		557	8.33	120	0.020	0.500	0.140	0.012
	16	20 0013	18.0	9.0		571	8.33	18	0.040	0.500	0.240	0.012

STORET RETRIEVAL DATE 77/03/24

400405
35 11 40.0 095 44 30.0 4
LAKE EUFAULA
40121 OKLAHOMA

101391

/TYPA/AMENT/LAKE

11EPALES 04001002
0020 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/04/01	11 30	0000	0.069	12.3	
	11 30	0005	0.077		
	11 30	0015	0.126		
74/06/13	11 10	0000	0.091	1.6	
	11 10	0002			1.0
	11 10	0005	0.137		
	11 10	0015	0.156		
	11 10	0020	0.195		
74/08/27	09 50	0000	0.124	3.3	
	09 50	0005	0.113		
	09 50	0011	0.121		
74/10/21	16 20	0000	0.081	25.4	
	16 20	0005	0.086		
	16 20	0013	0.362		

STORET RETRIEVAL DATE 77/03/24

400407
35 19 57.0 095 35 07.0 3
LAKE EUFAULA
40091 OKLAHOMA
100892

/TYPA/AMBNT/LAKE

11EPALES 04001002
0061 FEET DEPTH CLASS 00

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
74/04/01	15 50	0000	12.9		21	411	7.90	81	0.060	0.500	0.430	0.061
	15 50	0005	12.8	9.8		412	7.80	74	0.060	0.400	0.420	0.058
	15 50	0015	12.8	10.0		412	7.70	84	0.060	0.500	0.430	0.061
	15 50	0035	12.5	9.6		404	7.70	83	0.080	0.500	0.440	0.061
	15 50	0055	12.2	9.6		421	7.70	86	0.060	0.400	0.430	0.056
74/06/14	10 10	0000	25.8	6.8	10	598	8.20	109	0.040	0.500	0.450	0.046
	10 10	0005	25.8	7.0		608	8.40	106	0.040	0.400	0.380	0.043
	10 10	0015	25.1	5.6		571	8.20	106	0.040	0.400	0.450	0.056
	10 10	0023	25.0	5.8		559	8.20	108	0.040	0.400	0.460	0.057
	10 10	0040	24.5	5.2		544	8.10	113	0.050	0.400	0.520	0.065
	10 10	0060	24.4	4.8		535	8.00	102	0.130	0.500	0.570	0.073
74/08/28	14 05	0000	26.9	6.4	12	465	7.90	100	0.080	0.800	0.320	0.037
	14 05	0005	27.0	6.2		463	7.90	100	0.070	0.400	0.300	0.036
	14 05	0015	26.9	6.4		458	8.00	99	0.080	0.400	0.310	0.034
	14 05	0035	26.6	6.2		428	8.00	95	0.320	0.400	0.290	0.029
	14 05	0050	26.0	3.2		462	7.75	103	0.040	0.400	0.360	0.044
74/10/22	12 10	0000	18.3	9.0	24	357	7.95	86	0.040	0.600	0.300	0.032
	12 10	0005	18.3	8.6		359	7.97	84	0.030	0.400	0.300	0.034
	12 10	0015	18.2	6.8		355	7.91	95	0.040	0.600	0.360	0.058
	12 10	0035	18.0	8.0		459	7.85	96	0.050	0.500	0.350	0.060
	12 10	0054	17.9	8.0		437	7.83	96	0.050	0.400	0.340	0.055

STORET RETRIEVAL DATE 77/03/24

400407
35 19 57.0 095 35 07.0 3
LAKE EUFAULA
40091 OKLAHOMA
100892

/TYPA/AMBNT/LAKE

11EPALES 04001002
0061 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLOROPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/04/01	15	50 0000	0.083	4.8	
	15	50 0005	0.091		
	15	50 0015	0.079		
	15	50 0035	0.079		
	15	50 0055	0.084		
74/06/14	10	10 0000	0.100	1.2	
	10	10 0003			1.0
	10	10 0005	0.084		
	10	10 0015	0.105		
	10	10 0023	0.114		
	10	10 0040	0.121		
	10	10 0060	0.160		
74/08/28	14	05 0000	0.089	5.2	
	14	05 0003			1.0
	14	05 0005	0.079		
	14	05 0015	0.081		
	14	05 0035	0.098		
	14	05 0050	0.082		
74/10/22	12	10 0000	0.061	4.6	
	12	10 0005	0.059		1.0
	12	10 0015	0.085		
	12	10 0035	0.091		
	12	10 0054	0.087		

STORET RETRIEVAL DATE 77/03/24

400408
35 23 23.0 095 38 32.0 3
LAKE EUFAULA
40091 OKLAHOMA
100891

/TYPA/AMBNT/LAKE

11EPALES 04001002
0035 FEET DEPTH CLASS 00

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
74/04/01	16 20	0000	15.4		15	603	8.10	106	0.060	0.700	0.520	0.094
	16 20	0005	15.1	9.8		591	8.00	107	0.060	0.700	0.520	0.092
	16 20	0015	14.1	9.6		573	7.90	104	0.090	0.600	0.530	0.090
	16 20	0030	12.9	8.8		585	7.75	109	0.130	0.700	0.560	0.088
74/06/14	09 30	0000	26.2	6.2	12	642	8.30	107	0.050	0.700	0.650	0.107
	09 30	0005	26.1	6.0		633	8.30	105	0.070	0.600	0.600	0.108
	09 30	0015	25.5	5.4		555	8.10	98	0.050	0.700	0.580	0.112
	09 30	0025	24.2	3.0		325	7.90	77	0.100	0.700	0.500	0.097
	09 30	0035	23.8	1.8		299	7.50	75	0.130	0.800	0.490	0.091
74/08/28	14 30	0000	27.5	6.0	12	721	8.10	131	0.120	0.800	0.250	0.062
	14 30	0005	27.5	6.0		723	8.10	131	0.110	0.600	0.240	0.061
	14 30	0015	27.5	6.4		703	8.10	120	0.100	0.600	0.250	0.061
	14 30	0026	27.4	5.6		725	8.00	125	0.430	0.700	0.260	0.059
74/10/22	12 30	0000	17.9	7.2	27	503	8.01	102	0.050	0.700	0.360	0.084
	12 30	0005	18.0	8.6		497	8.01	104	0.050	0.600	0.350	0.084
	12 30	0020	17.8	8.6		503	7.97	104	0.050	0.600	0.350	0.085
	12 30	0031	17.8	7.4		515	7.97	104	0.060	0.700	0.360	0.076

STORET RETRIEVAL DATE 77/03/24

400408
35 23 23.0 095 38 32.0 3
LAKE EUFAULA
40051 OKLAHOMA

100891

/TYPA/AMBNT/LAKE

11EPALES 04001002
0035 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/04/01	16	20 0000	0.138	13.6	
	16	20 0005	0.128		
	16	20 0015	0.106		
	16	20 0030	0.160		
74/06/14	09	30 0000	0.180	2.0	
	09	30 0002			1.0
	09	30 0005	0.177		
	09	30 0015	0.185		
	09	30 0025	0.298		
	09	30 0035	0.340		
74/08/28	14	30 0000	0.110	8.0	
	14	30 0005	0.108		
	14	30 0015	0.107		
	14	30 0026	0.164		
74/10/22	12	30 0000	0.120	5.8	
	12	30 0005	0.119		
	12	30 0006			1.0
	12	30 0020	0.118		
	12	30 0031	0.138		

STORET RETRIEVAL DATE 77/03/24

400409
35 26 03.0 095 36 29.0 3
LAKE EUFAULA
40091 OKLAHOMA
100891

/TYPA/AMBNT/LAKE

11EPALES 04001002
0050 FEET DEPTH CLASS 00

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
74/04/01	16 50	0000	14.0		20	447	7.85	86	0.050	0.600	0.310	0.015
	16 50	0005	13.8	9.4		447	7.80	87	0.040	0.500	0.300	0.014
	16 50	0015	13.4	9.8		446	7.80	88	0.050	0.500	0.310	0.015
	16 50	0030	13.2	9.6		437	7.75	89	0.060	0.500	0.290	0.019
	16 50	0045	12.4	9.4		437	7.85	91	0.050	0.800	0.300	0.030
74/06/13	11 40	0000	25.1	6.0	12	493	7.30	111	0.040	0.700	0.470	0.030
	11 40	0005	25.0	5.8		496	7.30	159	0.040	0.600	0.490	0.030
	11 40	0015	24.8			502	7.30	108	0.060	0.600	0.540	0.031
	11 40	0035	24.5	5.8		528	7.30	113	0.040	0.600	0.510	0.029
	11 40	0047	24.6	6.7		522	7.50	112	0.080	0.500	0.600	0.029
74/08/28	15 00	0000	26.9	7.2	6	319	8.10	90	0.080	0.800	0.390	0.039
	15 00	0005	26.8	6.8		317	8.10	90	0.030	0.500	0.390	0.041
	15 00	0015	26.6	6.2		315	8.05	88	0.570	0.400	0.450	0.037
	15 00	0040	26.3	6.2		314	8.00	88	0.050	0.500	0.410	0.037
74/10/22	12 50	0000	17.8	8.6	12	373	7.83	99	0.040	0.800	0.330	0.032
	12 50	0005	17.8	8.0		373	7.83	102	0.030	0.700	0.320	0.030
	12 50	0015	17.7	8.2		375	7.83	102	0.030	0.700	0.320	0.030
	12 50	0030	17.5	8.4		375	7.83	101	0.030	0.700	0.310	0.032
	12 50	0046	17.4	8.0		375	7.83	101	0.040	0.500	0.310	0.038

STORET RETRIEVAL DATE 77/03/24

400409
35 26 03.0 095 36 29.0 3
LAKE EUFAULA
40091 OKLAHOMA

100891

/TYPA/AMBNT/LAKE

11EPALES 04001002
0050 FEET DEPTH CLASS 00

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/04/01	16	50 0000	0.040	7.5	
	16	50 0005	0.043		
	16	50 0015	0.042		
	16	50 0030	0.045		
	16	50 0045	0.183		
74/06/13	11	40 0000	0.099	1.8	
	11	40 0001			1.0
	11	40 0005	0.107		
	11	40 0015	0.101		
	11	40 0035	0.086		
	11	40 0047	0.083		
74/08/28	15	00 0000	0.156	2.0	
	15	00 0001			1.0
	15	00 0005	0.123		
	15	00 0015	0.118		
	15	00 0040	0.119		
74/10/22	12	50 0000	0.073	2.4	
	12	50 0003			1.0
	12	50 0005	0.067		
	12	50 0015	0.070		
	12	50 0030	0.069		
	12	50 0046	0.127		

APPENDIX D

TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 77/03/24

4004A1
35 18 23.0 095 21 25.0 4
CANADIAN RIVER
40 7.5 PORUM
O/EUFAULA RESERVOIR 101392
TURBINE DISCH AT EUFAULA DAM POWERHOUSE
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

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
74/11/02	17	00	0.248	1.450	0.035	0.025	0.290
75/01/18	13	50	0.381	2.850	0.054	0.050	0.100
75/02/16	14	40	0.329	0.800	0.041	0.060	0.100
75/03/09	13	17	0.312	0.700	0.056	0.056	0.110
75/08/25	09	30	0.660	1.150	0.025	0.160	0.440
75/10/16	14	00	0.005	3.600	0.055	0.090	0.290

STORET RETRIEVAL DATE 77/03/24

4004A2
35 08 45.0 095 54 00.0 4
CANADIAN RIVER
40 7.5 HANNA
T/EUFAULA RESERVOIR 101391
INDIAN NTN TPK BRDG 5 MI S OF VERNON
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

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
74/11/03	09	00	0.112	3.100	0.105	0.040	0.650
74/12/07	16	00	0.264	2.500	0.110	0.100	0.190
75/01/21	10	30	0.400	1.700	0.176	0.105	0.230
75/02/13	10	50	0.280	2.500	0.160	0.072	0.270
75/03/10	10	00	0.336	1.900	0.048	0.088	0.300
75/04/04	11	00	0.230	2.200	0.080	0.060	0.300
75/04/28	11	10	0.180	2.700	0.030	0.055	0.660
75/05/05	10	15	0.200	4.000	0.230	0.070	0.650
75/06/29	10	10	0.005	2.700	0.045	0.045	0.210
75/07/07	11	00	0.005	2.600	0.045	0.050	0.200
75/08/06	10	55	0.315	4.000	0.180	0.080	0.650
75/09/11	13	30	0.050	1.100	0.035	0.075	0.230

STORET RETRIEVAL DATE 77/03/24

400481
35 10 46.0 095 28 22.0 4
LONGTOWN CREEK
40 7.5 ENTERPRISE
T/EUFAULA RESERVOIR 101392
2NDRY RD BRDG 4 MI NW OF RUSSELLVILLE
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

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
74/11/09	16	00	0.048	0.700	0.104	0.008	0.020
74/12/14	15	30	0.040	0.500	0.037	0.007	0.020
75/01/18	12	50	0.024	1.400	0.028	0.005	0.020
75/03/09	13	35	0.024	0.900	0.064	0.008K	0.040

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 77/03/24

4004C1
34 53 30.0 095 26 25.0 4
GAINES CREEK
40 LATIMER CO MAP
T/EUFAULA RESERVOIR 101392
US HWY 270 BRDG 7 MI W OF WILBURTON
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

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
74/11/03	10	50	0.048	0.850	0.050	0.020	0.095
74/12/14	10	30	0.064	0.500	0.035	0.010	0.040
75/01/11	12	45	0.068	0.550	0.016	0.010	0.050
75/02/28	10	30	0.056	0.900	0.040	0.008	0.030
75/03/24	14	00	0.035	0.500	0.045	0.010	0.040
75/04/04	14	00	0.020	0.450	0.020	0.010	0.040
75/05/18	14	10	0.075	0.800	0.060	0.040	0.070
75/07/30	11	00	0.045	1.400	0.050	0.010	0.070
75/10/19	12	00	0.010	0.700	0.025	0.005	0.050

STORET RETRIEVAL DATE 77/03/24

400401
34 51 45.0 095 35 50.0 4
BRUSHY CREEK
40 PITTSBURG CO MAP
T/EUFAULA RESERVOIR 101692
US HWY 270 BRDG E EDGE OF HAILEYVILLE
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

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
74/11/03	10	25	0.048	1.200	0.030	0.020	0.190
74/12/14	10	00	0.080	2.100	0.055	0.020	0.080
75/01/11	13	15	0.080	2.465	0.040	0.015	0.087
75/02/28	10	00	0.072	0.600	0.024	0.056	0.056
75/03/24	14	30	0.030	0.550	0.015	0.010	0.070
75/04/04	14	30	0.055	0.450	0.020	0.015	0.050
75/04/27	11	00	0.005	2.400	0.030	0.375	0.780
75/04/30	08	00	0.040	0.300	0.290	0.260	1.026
75/05/18	14	00	0.170	0.550	0.045	0.020	0.070
75/07/30	08	30	0.175	0.900	0.060	0.025	0.130
75/10/18	12	30	0.005	1.000	0.030	0.020	0.160

STORET RETRIEVAL DATE 77/03/24

4004E1
35 59 00.0 095 49 25.0 4
COAL CREEK
40 7.5 MCALESTER
T/EUFAULA RESERVOIR 100991
MUTY RD BRDG 4 MI NW MCALESTER
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

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
74/11/03	09	30	0.048	1.700	0.050	0.025	0.180
74/12/07	15	30	0.096	2.600	0.065	0.015	0.130
75/01/11	11	15	0.032	1.175	0.032	0.015	0.045
75/02/13	11	20	0.040	1.800	0.040	0.016	0.070
75/03/10	10	30	0.072	1.900	0.088	0.016	0.100
75/04/04	11	30	0.045	1.850	0.280	0.015	0.050
75/04/28	10	45	0.060	1.400	0.060	0.020	0.140
75/05/05	10	15	0.070	1.850	0.075	0.020	0.080
75/06/29	11	30	0.040	1.050	0.045	0.128	0.140
75/07/07	12	30	0.025	1.100	0.040	0.020	0.100
75/08/06	11	45	0.020	1.300	0.065	0.025	0.130
75/09/11	14	05	0.010	0.800	0.022	0.030	0.090
75/10/16	14	30	0.005	0.900	0.025	0.010	0.100

STORET RETRIEVAL DATE 77/03/24

4004F1
35 13 12.0 095 48 13.0 4
MILL CREEK
40 7.5 INDIANOLA
T/EUFAULA RESERVOIR 101391
2NDRY RD BRDG 4.5 MI SSW OF RAIFORD
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STRM

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
74/11/09	10	25	0.080	1.200	0.056	0.016	0.060
74/12/14	14	00	0.112	1.600	0.090	0.015	0.080
75/01/18	11	15	0.184	2.400	0.352	0.025	0.090
75/03/09	14	15	0.200	1.000	0.024	0.016	0.090

STORET RETRIEVAL DATE 77/03/24

400461
35 23 05.0 095 53 08.0 4
NORTH CANADIAN RIVER
40 7.5 HENRYETTA
T/EUFAULA RESERVOIR 100891
OK HWY 52 BRDG 2.6 MI E OF SALEM
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

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
74/11/02	09	25	0.192	2.300	0.035	0.158	0.840
74/12/14	10	00	1.440	5.400	0.175	0.660	1.050
75/01/18	09	30	1.560	4.200	0.448	0.975	1.200
75/02/15	11	20	1.000L	1.800	0.089	0.660	0.920
75/03/22	10	00	0.940	1.950	0.032	0.336	0.830
75/05/19	17	00	0.680	1.550	0.025	0.270	0.580
75/05/31	17	00	0.690	3.150	0.040	0.270	1.250
75/06/21	16	00	0.600	2.000	0.025	0.260	0.930
75/07/17	17	30	0.010	1.750	0.025	0.430	0.760
75/08/22	17	00	1.500	1.600	0.060	0.775	1.450
75/09/05	17	00	0.010	2.500	0.012	0.475	1.050
75/10/05	10	30	0.015	2.400	0.045	0.420	0.850

L ACTUAL VALUE IS KNOWN TO BE
GREATER THAN VALUE GIVEN

STORET RETRIEVAL DATE 77/03/24

4004H1
35 34 07.0 095 57 18.0 4
DEEP FORK
40 7.5 OKMULGEE S
T/EUFAULA RESERVOIR 100891
US HWY 75/62 BRDG 4 MI S OF OKMULGEE
11EPALES 04001004
0000 FEET DEPTH CLASS 00

/TYPA/AMBNT/STREAM

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
74/11/02	10	45	0.048	1.400	0.050	0.075	0.290
74/12/20	09	45	0.416	1.800	0.130	0.090	0.290
75/01/23	14	30	0.160	1.500	0.048	0.075	0.200
75/02/21	10	00	0.339	1.700	0.080	0.072	0.150
75/03/25	09	00	0.190	2.300	0.045	0.035	0.290
75/04/21	09	30	0.310	2.400	0.080	0.105	0.340
75/04/24	10	00	0.310	2.600	0.075	0.100	0.440
75/05/20	09	00	0.315	1.500	0.040	0.055	0.260
75/05/23	13	00	0.315	1.380	0.045	0.055	0.230
75/06/17	10	00	0.375	1.500	0.025	0.060	0.460
75/09/29	09	00	0.890	1.500	0.270	0.210	0.420
75/10/24	10	00	0.065	2.400	0.100	0.155	0.480

STORET RETRIEVAL DATE 77/03/24

400421 TF400421 P020000
34 57 00.0 095 47 30.0 4
CITY OF MCALESTER
40 7.5 MCALESTER
O/EUFAULA RESERVOIR 101392
EUFAULA RESERVOIR
11EPALES 00001004
0000 FEET DEPTH CLASS 00

/AMBNT/STREAM

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
75/05/09	09 45		5.100	8.100	1.050	4.600	5.500	0.900	0.900
75/05/30	11 00								
CP(T)-			7.350	10.500	0.520	1.600	1.700	0.900	0.900
75/05/30	16 00								
75/06/13	15 30		9.450	7.800	1.150	6.400	7.000	0.900	0.900
75/06/30	16 00		6.200	6.400	0.290	4.100	5.000	0.900	0.900
75/07/15	17 00		5.500	11.500	4.500	6.100	7.400	0.900	0.900
75/07/29	17 00		8.600	13.000	3.500	7.500	9.200	0.900	0.900
75/10/29	00 00		10.000	8.700	2.100	7.600	8.300	0.900	0.900
75/11/12	10 00		8.900	9.950	2.000	7.200	9.100	0.900	0.900
75/11/25	11 30		7.100	14.000	11.500	7.700	8.600	1.000	1.000
75/12/11	09 25		7.400	7.400	0.570	5.300	8.300	0.990	0.900
75/12/22	13 15		4.925	21.000	6.700	6.900	8.900	0.950	0.900

STORET RETRIEVAL DATE 77/03/24

4004EA TF4004EA P006000
35 28 00.0 096 00 00.0 4
HENRYETTA
40 7.5 HENRYETTA
T/EUFAULA RESERVOIR 100891
COAL CREEK
11EPALES 00001004
0000 FEET DEPTH CLASS 00

/AMBNT/STREAM

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
75/06/11	13	00	4.500	19.000	1.750	3.250	4.600	1.250	1.080
75/06/25	14	00	4.300	32.000	13.000	8.700	11.000	0.750	0.800
75/07/09	13	00	4.700	27.700	11.500	9.900	12.000	0.550	0.830
75/08/13	13	00	2.000	40.000	26.000	10.500	13.500	0.600	0.440
75/08/20	14	00	3.000	26.000	12.000	9.100	11.500	0.600	0.440
75/08/27	13	00	3.800	24.000	14.000	7.600	8.900	0.370	0.400
75/09/03	14	00	4.800	32.500	17.000	10.500	12.000	0.750	0.440
75/09/17	13	00	3.100	24.000	9.100	5.800	7.400	0.850	0.440
75/10/08	13	00	4.100	36.000	19.000	9.600	12.000	0.360	0.500
75/10/15	13	00	3.850	21.000	9.000	6.300	7.800	0.750	0.500
75/10/29	13	00	5.100	33.000	18.500	10.500	11.500	0.590	0.500
75/11/12	13	00	4.100	29.500	17.000	8.300	9.750	0.400	0.380

STORET RETRIEVAL DATE 77/03/24

40040GA M040040GA P000000
35 20 00.0 096 0E 00.0 4
WELEETKA POWER STAT.
40 7.5 WELEETKA
T/EUFAULA RESERVOIR 100691
NORTH CANADIAN RIVER
/AMENT/STREAM 11EPALES 00001004
0000 FEET DEPTH CLASS 00

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
75/05/23	09 05		1.800	1.100	0.050K	0.560	0.990		
75/06/05	09 25		0.900	1.500	0.050	0.340	0.980		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 77/03/24

400468 TF400460 P300000*
35 28 00.0 097 27 30.0 4
S. OKLAHOMA CITY
40 7.5 MIDWEST CITY
TEUFAULA RESERVOIR 100892
NORTH CANADIAN RIVER
11EPALES 00001004
0000 FEET DEPTH CLASS 00

/AMBNT/STREAM

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
75/06/11	08 00								
CP(T)-			3.400	17.500	3.450	8.850	9.500	29.200	29.000
75/06/12	08 00								
75/06/29	00 00								
CP(T)-			8.200	8.600	1.650	8.300	8.700	29.700	29.000
75/06/29	24 00								
75/07/15	08 00								
CP(T)-			6.900	7.000	0.140	7.800	8.200	31.000	29.000
75/07/16	08 00								
75/07/28	08 00								
CP(T)-			9.000	7.300	0.890	6.000	7.200	38.000	30.000
75/07/29	08 00								
75/08/08	08 00								
CP(T)-			14.700	2.900	0.025K	11.500	13.000	29.000	32.000
75/08/09	08 00								
75/08/21	08 00								
CP(T)-			5.800	11.500	0.120	8.900	9.100	29.200	27.000
75/08/22	08 00								
75/09/08	08 00								
CP(T)-			6.900	9.400	0.780	9.900	9.900	28.600	30.200
75/09/09	08 00								
75/09/18	08 00								
CP(T)-			4.300	16.500	8.150	9.700	11.000	29.400	30.000
75/09/19	08 00								
75/10/02	08 00								
CP(T)-			4.600	15.000	4.150	11.000	11.500	31.400	30.000
75/10/03	08 00								
75/10/15	08 00								
CP(T)-			4.100	16.000	3.180	9.000	9.600	27.400	28.000
75/10/15	20 00								
75/10/29	08 00		3.300	18.000	5.800		6.100	27.400	28.000
75/11/14	08 00								
CP(T)-			5.200	19.000	8.600	10.500	11.500	24.800	26.200
75/11/14	24 00								

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 77/03/24

4004HA TF4004HA P017000
35 34 00.0 096 58 30.0 4
OKMULGEE
40 7.5 OKMULGEE SW.
T/EUFAULA RESERVOIR 100891
DEEP FORK RIVER
11EPALES 0000100
0000 FEET DEPTH CLASS 00

/AMBNT/STREAM

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
75/06/23	08 30		11.500	0.870	0.380	6.400	6.600	1.590	1.500
75/07/07	09 00		0.025	25.500L	15.500	9.900	11.200	1.500	1.500
75/07/21	08 00		10.000	5.500	1.400	9.750	10.000	1.500	2.000
75/08/04	08 30		12.000	8.500	2.000	9.700	10.500	1.000	1.400
75/08/18	10 30		7.200	5.200	0.790	5.500	5.500	1.500	1.600
75/09/02	08 00		4.400	9.200	4.700	8.400	9.150	1.580	1.600
75/09/15	08 00		11.000	2.600	0.375	6.100	6.300	1.600	2.000
75/09/29	08 00		8.000	13.000	5.800	7.900	9.650	1.500	1.500
75/10/13	08 30		27.000	5.650	0.890	9.750	10.000	1.500	1.550
75/11/03	08 00		9.800	6.000	0.630	5.600	6.400	1.500	2.000

L ACTUAL VALUE IS KNOWN TO BE
GREATER THAN VALUE GIVEN

STORET RETRIEVAL DATE 77/03/24

4004XA TF4004XA P002000*
34 58 00.0 095 47 00.0 4
N.A.D. MCALESTER
40 7.5 MCALESTER
T/EUFAULA RESERVOIR 101392
BULL CREEK
11EPALES 0000100-
0000 FEET DEPTH CLASS 00

/AMBNT/STREAM

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
75/05/06	11	00							
CP(T)-			2.900	0.560	0.056	1.300	1.300	0.350	0.363
75/05/06	15	00							
75/05/27	11	00							
CP(T)-			5.500	1.200	0.380	0.932	0.940	0.510	0.235
75/05/27	16	00							
75/06/17	11	00							
CP(T)-			2.100	1.900	0.230	0.560	1.100	0.850	0.342
75/06/17	16	00							
75/07/08	11	00	6.800	3.000	0.240	1.215	1.500	0.240	0.414
75/07/29	10	00							
CP(T)-			4.200	2.200	0.090	1.350	1.700	0.309	0.254
75/07/29	16	00							
75/08/22	11	00							
CP(T)-			4.400	1.800	0.090	1.650	1.900	0.245	0.260
75/08/22	16	00							
75/09/09	11	00							
CP(T)-			6.500	1.900	0.380	1.800	2.100	0.201	0.240
75/09/09	16	00							
75/09/30	11	00							
CP(T)-			7.500	2.700	0.175	1.800	2.100	0.133	0.222
75/09/30	16	00							
75/10/21	11	00							
CP(T)-			6.000	2.000	0.081	2.300	2.850	0.146	0.150
75/10/21	16	00							
75/11/11	11	00							
CP(T)-			4.700	2.000	0.050	1.250	1.500	0.150	0.313
75/11/11	16	00							
75/12/02	11	00							
CP(T)-			3.500	3.700	0.100	0.690	1.100	0.336	0.240
75/12/02	16	00							
76/01/05	11	00							
CP(T)-			5.100	2.800	0.125	0.870	1.200	0.193	0.257
76/01/05	16	00							
76/01/27	11	00							
CP(T)-			4.950	2.000	0.225	1.350	1.750	0.165	0.250
76/01/27	16	00							

STORET RETRIEVAL DATE 77/03/24

4004YA P04004YA P001250
34 51 00.0 095 35 00.0 4
HAILEYVILLE
40 7.5 HARTSHORNE
T/EUFAULA RESERVOIR 101692
BLUE CREEK
11EPALES 0000100
0000 FEET DEPTH CLASS 00

/AMBNT/STREAM

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
75/05/30	22	00	0.250	9.400	0.390	1.200	3.100	0.043	0.014
75/06/20	10	00	0.200	5.500	0.230	1.200	2.200	0.033	0.036
75/07/11	10	00	0.050	10.500	0.125	3.300	4.300	0.009	0.025
75/08/04	10	00	0.150	9.400	0.110	3.150	3.900	0.020	0.013
75/08/27	10	00	0.200	6.100	0.025K	3.000	3.500	0.014	0.013
75/09/08	08	30	0.525	2.800	0.100	3.200	3.900		0.015
75/10/13	10	00	0.225	9.900	0.050	4.300	5.600		0.014
75/11/05	10	00	0.600	4.200	0.120	3.500	3.700	0.036	0.012
75/11/18	10	00	0.075	7.600	0.468	4.100	4.300	0.015	0.012
75/12/11	10	00	0.075	7.300		2.200	3.000	0.014	0.021
75/12/30	10	00	0.425	4.600	0.200	1.025	1.100	0.078	0.026
76/01/20	13	00	0.125	8.450	0.175	1.900	3.000	0.011	0.035
76/01/30	10	00	0.625	13.000	1.000	3.300	4.700	0.065	0.039

K VALUE KNOWN TO BE
LESS THAN INDICATED

APPENDIX E

PARAMETRIC RANKINGS OF LAKES SAMPLED BY NES IN 1974

STATE OF OKLAHOMA

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 ORTHO P
4001	ALTUS RESERVOIR	0.041	0.060	466.625	14.750	8.400	0.010
4002	ARBUCKLE LAKE	0.020	0.070	443.600	7.027	14.500	0.008
4003	LAKE ELLSWORTH	0.037	0.070	454.400	8.430	9.400	0.009
4004	LAKE EUFAULA	0.051	0.405	482.513	4.383	14.200	0.029
4005	FORT COBB RESERVOIR	0.036	0.110	454.667	14.967	8.400	0.012
4006	FORT SUPPLY RESERVOIR	0.070	0.135	485.167	9.733	7.800	0.014
4007	FOSS DAM RESERVOIR	0.027	0.090	463.857	4.862	8.400	0.006
4008	LAKE FRANCES	0.142	1.780	484.333	7.973	8.200	0.093
4009	GRAND LAKE O' THE CHEROK	0.087	0.740	468.857	6.768	14.800	0.038
4010	LAKE HEFNER	0.057	0.250	461.000	5.667	9.000	0.036
4011	KEYSTONE RESERVOIR	0.136	0.690	484.303	21.427	14.900	0.096
4012	OOLOGAH LAKE	0.059	0.580	483.000	5.137	14.600	0.031
4013	TENKILLER FERRY RESERVOI	0.039	0.550	435.500	6.646	15.000	0.016
4014	LAKE THUNDERBIRD	0.027	0.150	465.000	8.422	12.000	0.009
4015	WISTER RESERVOIR	0.080	0.230	478.500	4.812	15.000	0.016
4834	TEXOMA LAKE	0.045	0.160	460.875	12.325	14.600	0.016

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 ORTHO P
4001	ALTUS RESERVOIR	60 (9)	100 (15)	47 (7)	13 (2)	80 (11)	73 (11)
4002	ARBUCKLE LAKE	100 (15)	90 (13)	93 (14)	53 (8)	33 (4)	93 (14)
4003	LAKE ELLSWORTH	80 (12)	90 (13)	80 (12)	33 (5)	60 (9)	87 (13)
4004	LAKE EUFAULA	20 (3)	33 (5)	27 (4)	100 (15)	47 (7)	33 (5)
4005	FORT COBB RESERVOIR	73 (11)	73 (11)	87 (13)	7 (1)	80 (11)	67 (10)
4006	FORT SUPPLY RESERVOIR	33 (5)	67 (10)	0 (0)	27 (4)	100 (15)	60 (9)
4007	FOSS DAM RESERVOIR	93 (14)	80 (12)	60 (9)	87 (13)	80 (11)	100 (15)
4008	LAKE FRANCES	0 (0)	0 (0)	7 (1)	47 (7)	93 (14)	7 (1)
4009	GRAND LAKE O' THE CHEROK	13 (2)	7 (1)	40 (6)	60 (9)	20 (3)	13 (2)
4010	LAKE HEFNER	47 (7)	40 (6)	67 (10)	73 (11)	67 (10)	20 (3)
4011	KEYSTONE RESERVOIR	7 (1)	13 (2)	13 (2)	0 (0)	13 (2)	0 (0)
4012	OOLOGAH LAKE	40 (6)	20 (3)	20 (3)	80 (12)	33 (4)	27 (4)
4013	TENKILLER FERRY RESERVOI	67 (10)	27 (4)	100 (15)	67 (10)	3 (0)	50 (7)
4014	LAKE THUNDERBIRD	87 (13)	60 (9)	53 (8)	40 (6)	53 (8)	80 (12)
4015	WISTER RESERVOIR	27 (4)	47 (7)	33 (5)	93 (14)	3 (0)	40 (6)
4834	TEXOMA LAKE	53 (8)	53 (8)	73 (11)	20 (3)	33 (4)	50 (7)