U.S. ENVIRONMENTAL PROTECTION AGENCY
NATIONAL EUTROPHICATION SURVEY

WORKING PAPER SERIES

REPORT

ON

LAKE TAWAKONI

HUNT, RAINS, AND VAN ZANDT COUNTIES

TEXAS

EPA REGION VI

WORKING PAPER No. 662

CORVALLIS ENVIRONMENTAL RESEARCH LABORATORY - CORVALLIS, OREGON

and

ENVIRONMENTAL MONITORING & SUPPORT LABORATORY - LAS VEGAS, NEVADA

☆G.P.O. 699-440

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WITH THE COOPERATION OF THE

TEXAS WATER QUALITY BOARD

AND THE

TEXAS NATIONAL GUARD

APRIL, 1977

CONTENTS

F O R E W O R D

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 non-point 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 fresh water 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 EPA and to augment plans implementation by the states.

ACKNOWLEDGEMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Texas Water Quality Board for professional involvement, to the Texas National Guard for conducting the tributary sampling phase of the Survey, and to those Texas wastewater treatment plant operators who voluntarily provided effluent samples.

Hugh C. Yantis, Jr., Executive Director of the Texas Water Quality Board, and John B. Latchford, Jr., Director, and the staff of the Field Operations Division provided invaluable lake documentation and counsel during the Survey, reviewed the preliminary reports, and provided critiques most useful in the preparation of this Working Paper series.

Major General Thomas Bishop, the Adjutant General of Texas, and Project Officer Colonel William L. Seals, who directed the volunteer efforts of the Texas National Guardsmen, are also gratefully acknowledged for their assistance to the Survey.

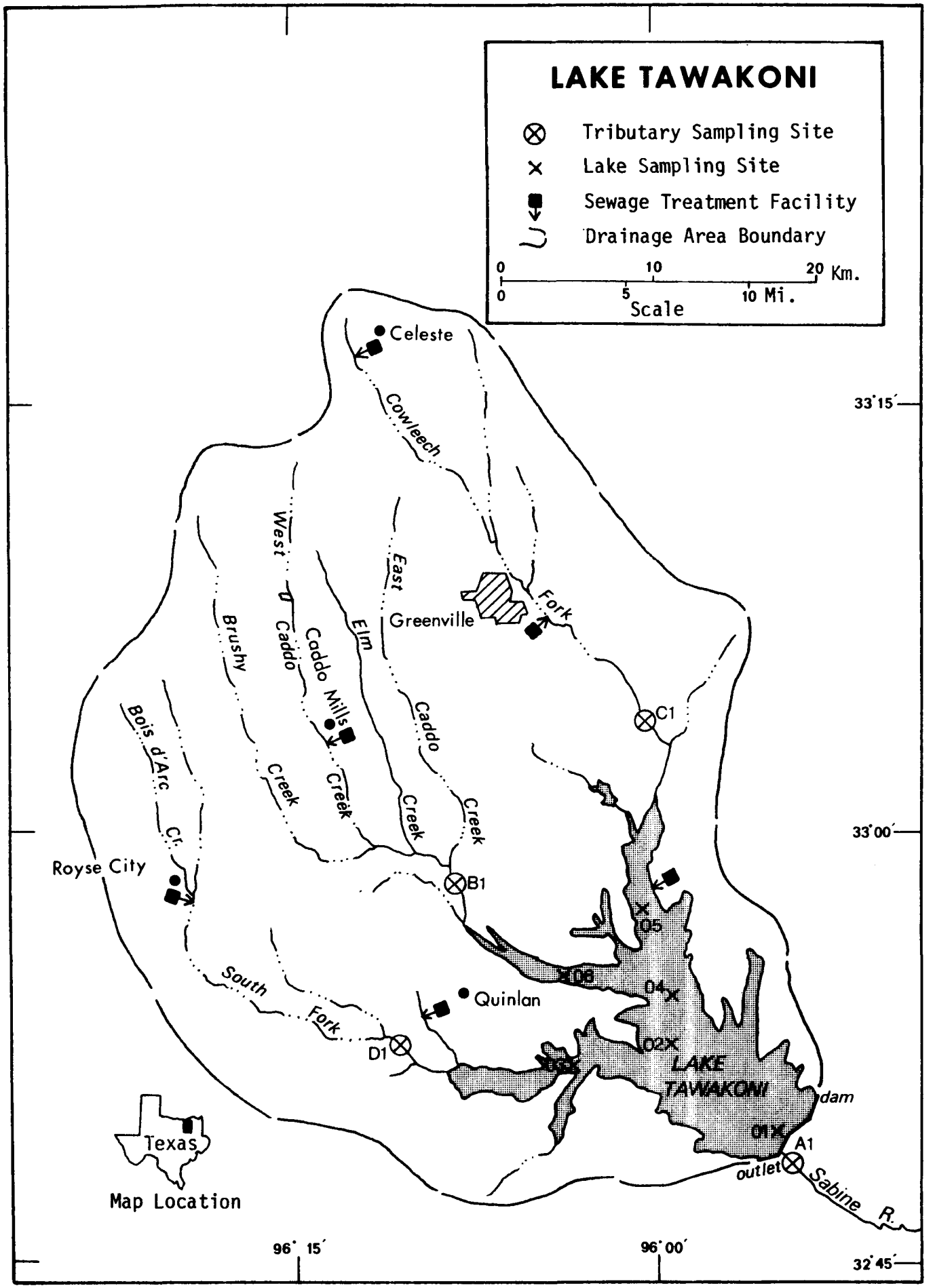
NATIONAL EUTROPHICATION SURVEY

STUDY RESERVOIRS

State of Texas

NAME	COUNTY
Amistad	Val Verde
Bastrop	Bastrop
Belton	Bell, Coryell
Braunig	Bexar
Brownwood	Brown
Buchanan	Burnet, Llano
Caddo	Harrison, Marion, TX; Caddo Parish, LA
Calaveras	Bexar
Canyon	Comal
Colorado City	Mitchell
Corpus Christi	Jim Wells, Live Oak, San Patricio
Diversion	Archer, Baylor
Eagle Mountain	Tarrant, Wise
Fort Phantom Hill	Jones
Houston	Harris
Kemp	Baylor
Lake O'The Pines	Camp, Marion, Morris, Upshur
Lavon	Collin
Lewisville (Garza-Little Elm)	Denton
Livingston	Polk, San Jacinto, Trinity, Walker

Lyndon B. Johnson	Burnet, Llano
Medina	Bandera, Medina
Meredith	Hutchinson, Moore, Potter
O. C. Fisher (San Angelo)	Tom Green
Palestine	Anderson, Cherokee, Henderson, Smith
Possum Kingdom	Palo Pinto, Stephens, Young
Sam Rayburn	Angelina, Jasper Nacogdoches, Sabine, San Augustine
Somerville	Burleson, Lee, Washington
E. V. Spence	Coke
Stamford	Haskell
Stillhouse Hollow	Bell
Tawakoni	Hunt, Rains, Van Zandt
Texoma	Cooke, Grayson TX; Bryan, Johnston, Love, Marshall, OK
Travis	Burnet, Travis
Trinidad	Henderson
Twin Buttes	Tom Green
White River	Crosby
Whitney	Bosque, Hill
Wright Patman (Texarkana)	Bowie, Cass


LAKE TAWAKONI
Tributary Sampling Site
Lake Sampling Site
Sewage Treatment Facility
Drainage Area Boundary
0 10 20 Km.
0 5 10 Mi.
Scale
Celeste
Cowleech
West Caddo
East Caddo
Elm Creek
Brushy Creek
Bois d'Arc Cr.
Caddo Mills
Greenville
Fork
C1
Royse City
B1
South Fork
Quinlan
D1
D2
D3
D4
D5
LAKE TAWAKONI
dam
A1
outlet
Sabine R.
Texas
Map Location
33°15'
33°00'
32°45'
96° 15'
96° 00'

LAKE TAWAKONI

STORET NO. 4832

I. CONCLUSIONS

A. Trophic Condition:

Survey data indicate that Lake Tawakoni is eutrophic; i.e., well supplied with nutrients and quite productive. Whether nutrient enrichment is beneficial or deleterious depends on the actual or potential effect on the uses of the lake. In this regard, no nuisance conditions are known to personnel of the Texas Water Quality Board and there is little or no impairment of the designated beneficial uses of this water body.

Lake Tawakoni ranked twenty-eighth when the 39 Texas reservoirs sampled in 1974 were compared using a combination of six parameters* as an index to overall trophic quality. Twenty-six of the reservoirs had less median total phosphorus, 25 had less and three had the same median dissolved phosphorus, 11 had less and one had the same median inorganic nitrogen, 30 had less mean chlorophyll a, and 24 had greater mean Secchi disc transparency. Marked depression of dissolved oxygen with depth occurred at station 1 in August.

Survey limnologists observed surface concentrations of algae at station 6 in March and noted the occurrence of emergent

* See Appendix A.

macrophytes in the shoreline shallows near stations 3 and 6 at that time. Blue-green algae were dominant in the August phytoplankton sample (page 9).

Water milfoil is reported to be very abundant in some places in the lake (Moczygemba, 1974), and aquatic macrophytes are a potential problem in the Cowleech Fork embayment (Anonymous, 1974±?1).

B. Rate-Limiting Nutrient:

A significant loss of phosphorus occurred in the assay samples between the time of collection (11/01/74) and the beginning of the algal assays, and the results are not representative of conditions in the lake at the time the samples were taken. The lake data indicate nitrogen limitation at all stations in March and November but phosphorus limitation at all stations, except station 5, in May.

C. Nutrient Controllability:

1. Point sources--The phosphorus contribution of the point sources considered in this report apparently amounted to 23.9% of the total phosphorus load reaching the lake during the sampling year. The City of Greenville contributed 20.9%, and five other dischargers collectively contributed 3.0% of the total load.

The present phosphorus loading of 0.91 $g/m^2/yr$ is three times that proposed by Vollenweider (Vollenweider and Dillon, 1974) as a eutrophic loading (see page 16). While even complete

removal of phosphorus at the listed point sources probably would still leave a loading in excess of the eutrophic loading, it is likely that a high degree of phosphorus removal at the Greenville wastewater treatment plant would result in improvement in the quality of the Cowleech Fork embayment, particularly in view of the probable error in the "non-point" load of the Cowleech Fork (see below).

2. Non-point sources--It is calculated that over 76% of the total phosphorus load reaching the lake during the sampling year was contributed by non-point sources, but it is probable that the actual non-point load was less than indicated.

The Cowleech Fork apparently contributed 45% of the total phosphorus load (page 14) and had an exceptionally high export rate of 175 kg P/km^2 (page 16). However, the high nutrient concentrations measured at station C-1 (Appendix E) probably resulted from the relatively large amounts of Greenville effluent in the stream at that point in proportion to the total stream flow.

During the sampling year, the mean Greenville discharge was 0.103 m^3/sec, and the mean stream flow at the times the samples were taken was 0.482 m^3/sec (highest [30.299 m^3/sec] and lowest [0.003 m^3/sec] flows omitted; see Appendix C). On a yearly mean basis, then, the Greenville effluent would account for over 21% of the flow in the stream and, during dry periods, would account

for essentially all of the flow in the stream. In this regard, personnel of the Texas Water Quality Board calculated that 71% of the Cowleech Fork flow in January, 1974, was Greensville effluent (Anonymous, 1974[?]).

Therefore, the true non-point phosphorus load of the Cowleech Fork must have been much less than was measured; and, conversely, the proportion of the total load contributed by point sources must have been more that indicated above. For example, if the actual phosphorus export rate of the Cowleech Fork was the same as the somewhat high South Fork rate (48 $kg/km^2/yr$), the non-point contribution of the Cowleech Fork would have been 16,780 kg, a difference of 44,335 kg; and the proportion of point-source contribution would be increased from 23.9% to 35.6% of the total load.

II. LAKE AND DRAINAGE BASIN CHARACTERISTICS†

A. Morphometry††:

1. Surface area: 148.52 kilometers^2.
2. Mean depth: 7.7 meters.
3. Maximum depth: 20.4 meters.
4. Volume: 1,143.6 x 10^6 m^3.
5. Mean hydraulic retention time: 3.2 years.

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

1. Tributaries -

Name	Drainage area (km^2)*	Mean flow (m^3/sec)*
Caddo Creek	505.0	1.79
Cowleech Fk., Sabine River	349.6	2.92
S. Fk., Sabine River	203.8	1.88
Minor tributaries & immediate drainage -	751.0	4.67
Totals	1,809.4	11.26

2. Outlets -

Diversions	0.0	1.26**
Sabine River	1,957.9	10.00
Totals	1,957.9***	11.26***

C. Precipitation****:

1. Year of sampling: 131.3 centimeters.
2. Mean annual: 109.4 centimeters.

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† Table of metric conversions--Appendix B.
†† Moczygemba, 1974.
* For limits of accuracy, see Working Paper No. 175, "...Survey Methods, 1973-1976".
** Gray, 1976.
*** Includes area of lake; outflow adjusted to equal sum of the inflows.
**** See Working Paper No. 175.

III. WATER QUALITY SUMMARY

Lake Tawakoni was sampled four times in 1974 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from two or more depths at six stations on the lake (see map, page vi). 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 November visit, two 18.9-liter depth-integrated samples were 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 13.7 meters at station 1, 10.7 meters at station 2, 7.6 meters at station 3, 9.1 meters at station 4, 4.6 meters at station 5, and 3.4 meters at station 6.

The sampling results are presented in full in Appendix D and are summarized in the following table (the August nutrient samples were not preserved properly and were not analyzed).

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR TAWAKONI LAKE
STORET CODE 4832

PARAMETER	1ST SAMPLING (3/ 9/74) 6 SITES RANGE	MEAN	MEDIAN	2ND SAMPLING (5/17/74) 6 SITES RANGE	MEAN	MEDIAN	3RD SAMPLING (8/12/74) 6 SITES RANGE	MEAN	MEDIAN
TEMP (C)	12.6 - 19.4	15.8	16.1	19.8 - 26.5	24.3	24.7	25.7 - 26.9	26.4	26.4
DISS OXY (MG/L)	7.2 - 10.0	8.9	8.9	3.0 - 8.8	6.8	7.4	1.8 - 8.6	6.3	6.4
CNDCTVY (MCROMO)	138. - 170.	150.	144.	115. - 233.	181.	178.	215. - 235.	221.	218.
PH (STAND UNITS)	7.0 - 8.4	7.8	7.8	7.3 - 8.8	8.1	8.1	7.1 - 8.3	7.8	7.8
TOT ALK (MG/L)	65. - 74.	72.	72.	35. - 98.	78.	78.	******	-**********	
TOT P (MG/L)	0.026 - 0.131	0.050	0.036	0.025 - 0.132	0.058	0.051	******	-**********	
ORTHO P (MG/L)	0.007 - 0.052	0.013	0.010	0.008 - 0.032	0.015	0.014	******	-**********	
NO2+NO3 (MG/L)	0.030 - 0.560	0.083	0.040	0.070 - 0.760	0.262	0.210	******	-**********	
AMMONIA (MG/L)	0.030 - 0.080	0.046	0.040	0.020 - 0.090	0.046	0.040	******	-**********	
KJEL N (MG/L)	0.400 - 0.900	0.581	0.600	0.400 - 0.900	0.590	0.600	******	-**********	
INORG N (MG/L)	0.070 - 0.610	0.130	0.080	0.100 - 0.820	0.308	0.260	******	-**********	
TOTAL N (MG/L)	0.440 - 1.460	0.664	0.630	0.570 - 1.560	0.852	0.730	******	-**********	
CHLRPYL A (UG/L)	5.8 - 24.0	10.5	8.1	1.4 - 28.5	14.0	11.9	23.5 - 61.2	38.3	35.0
SECCHI (METERS)	0.3 - 1.4	0.9	1.0	0.3 - 1.1	0.6	0.4	0.5 - 1.8	1.0	1.0

A. SUMMARY OF PHYSICAL AND CHEMICAL CHARACTERISTICS FOR TAWAKONI LAKE
STORET CODE 4832

4TH SAMPLING (11/ 1/74)

PARAMETER	6 SITES RANGE	MEAN	MEDIAN
TEMP (C)	20.3 - 21.7	20.8	20.7
DISS OXY (MG/L)	5.0 - 8.0	7.1	7.6
CNDCTVY (MCROMO)	152. - 189.	159.	155.
PH (STAND UNITS)	7.0 - 8.0	7.5	7.6
TOT ALK (MG/L)	79. - 91.	84.	84.
TOT P (MG/L)	0.031 - 0.247	0.068	0.046
ORTHO P (MG/L)	0.010 - 0.157	0.032	0.020
NO2+NO3 (MG/L)	0.020 - 0.470	0.087	0.020
AMMONIA (MG/L)	0.020 - 0.070	0.045	0.050
KJEL N (MG/L)	0.200 - 0.900	0.417	0.400
INORG N (MG/L)	0.060 - 0.540	0.132	0.080
TOTAL N (MG/L)	0.320 - 1.370	0.505	0.420
CHLRPYL A (UG/L)	4.3 - 14.2	10.1	10.3
SECCHI (METERS)	0.5 - 1.3	0.9	0.9

B. Biological characteristics:

1. Phytoplankton -

Sampling Date	Station Number		Chlorophyll a (µg/l)
03/09/74	1.	Melosira sp.	5,861
	2.	Stephanodiscus sp.	624
	3.	Nitzschia sp.	587
	4.	Cryptomonas sp.	551
	5.	Chroomonas sp.	441
		Other genera	1,299
		Total	9,363
05/17/74	1.	Stephanodiscus sp.	956
	2.	Melosira sp.	665
	3.	Kirchneriella sp.	541
	4.	Scenedesmus sp.	540
	5.	Chroomonas sp.	499
		Other genera	1,747
		Total	4,948
08/12/74	1.	Oscillatoria sp.	2,750
	2.	Nitzschia sp.	2,750
	3.	Merismopedia sp.	1,550
	4.	Lyngbya sp.	1,250
	5.	Melosira sp.	1,200
		Other genera	6,152
		Total	15,652
11/01/74	1.	Oscillatoria sp.	359
	2.	Pennate diatoms	326
	3.	Dactylococcopsis sp.	196
	4.	Merismopedia sp.	196
	5.	Melosira sp.	163
		Other genera	510
		Total	1,730

2. Chlorophyll a -

Sampling Date	Station Number	Chlorophyll a (µg/l)
03/09/74	1	5.8
	2	5.8
	3	6.2
	4	10.1
	5	11.0
	6	24.0
05/17/74	1	1.4
	2	6.4
	3	11.0
	4	12.9
	5	24.1
	6	28.5
08/12/74	1	61.2
	2	24.8
	3	29.6
	4	23.5
	5	40.4
	6	50.6
11/01/74	1	4.3
	2	9.2
	3	12.3
	4	11.3
	5	14.2
	6	9.3

C. Limiting Nutrient Study:

A 50% loss of phosphorus occurred in the assay samples during shipment from the field to the laborotary, and the algal assay results are not representative of conditions in the lake at the time the samples were taken (11/01/74).

The lake data indicate a temporal and spatial combination of limiting nutrients. Following is a tabulation of the mean inorganic nitrogen/orthophosphorus ratios for each of the sampling stations and times with the indicated limiting nutrient in parentheses.

Station	03/11/74	05/17/74	11/01/74
1	11/1 (N)	18/1 (P)	10/1 (N)
2	9/1 (N)	25/1 (P)	6/1 (N)
3	12/1 (N)	25/1 (P)	2/1 (N)
4	8/1 (N)	19/1 (P)	5/1 (N)
5	5/1 (N)	10/1 (N)	2/1 (N)
6	8/1 (N)	22/1 (P)	3/1 (N)

IV. NUTRIENT LOADINGS
(See Appendix E for data)

For the determination of nutrient loadings, the Texas National Guard collected monthly near-surface grab samples from each of the tributary sites indicated on the map (page vi), except for the month of June when two samples were collected. Sampling was begun in September, 1974, and was completed in August, 1975.

Through an interagency agreement, stream flow estimates for the year of sampling and a "normalized" or average year were provided by the Texas District Office of the U.S. Geological Survey for the tributary sites nearest the lake, except for the South Fork of the Sabine River (station D-1). The drainage area of this stream and the flow (mean of 15 years) were obtained from U.S.G.S. records (Anonymous, 1975).

Except for the South Fork, nutrient loads in sampled tributaries were determined by using a modification of a U.S. Geological Survey computer for calculating stream loadings*. The nutrient loads in the South Fork were calculated using mean concentrations and the mean flow. Also, the nutrient loads in the water diverted by the Sabine River Authority were calculated using the mean nutrient concentrations at lake sampling station 1 and the mean diversion flow (Gray, 1976). Nutrient loads shown are those measured minus point-source loads, if any.

Nutrient loads for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were estimated using the adjusted nutrient

* See Working Paper No. 175.

loads at station B-1, in kg/km^2/year, and multiplying by the ZZ area in km^2.

The operators of the Caddo Mills, Celeste, Greenville, Quinlan, Royse City, and Wind Point Park wastewater treatment plants provided monthly effluent samples and corresponding flow data.

Four additional municipal wastewater treatment plants, with a combined effluent flow of 268 m^3/day, discharged in the drainage during the sampling year; however, these plants do not significantly influence the quality of the receiving streams and probably have little effect on the lake (Anonymous, 1974[?]).

A. Waste Sources:

1. Known municipal* -

Name	Pop. Served	Treatment	Mean Flow (m^3/d)	Receiving Water
Caddo Mills	1,100	stab. pond	214.4	West Caddo Creek
Celeste	736	stab. pond	265.0	Cowleech Fork
Greenville	24,000	tr. filter + pond	8,842.1	Cowleech Fork
Quinlan	844	act. sludge	486.8	Nufals Branch/ Jones Creek
Royse City	2,000	oxid. ditch	561.9	Pond Creek/ S. Fk., Sabine River
Wind Point Park	vari-able**	ext. aer.	5.6	Lake Tawakoni

2. Known industrial - None

* Treatment plant questionnaires.
** Park use varies from year to year.

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	kg P/ yr	% of total
a. Tributaries (non-point load) -		
Caddo Creek	11,670	8.7
Cowleech Fork	61,115	45.4
South Fork	9,870	7.3
b. Minor tributaries & immediate drainage (non-point load) -	17,275	12.8
c. Known municipal STP's -		
Caddo Mills	345	0.3
Celeste	460	0.3
Greenville	28,115	20.9
Quinlan	1,475	1.1
Royse City	1,750	1.3
Wind Point Park	30	<0.1
d. Septic tanks - Unknown	?	-
e. Known industrial - None	-	-
f. Direct precipitation* -	2,600	1.9
Total	134,705	100.0

2. Outputs -

Lake outlets - Diversions	1,390	
Sabine River	14,960	
Total	16,350	

3. Net annual P accumulation - 118,355 kg.

* 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) -		
Caddo Creek	105,920	11.3
Cowleech Fork	347,775	37.0
South Fork	104,885	11.2
b. Minor tributaries & immediate drainage (non-point load) -	157,710	16.8
c. Known municipal STP's -		
Caddo Mills	650	0.1
Celeste	930	0.1
Greenville	54,730	5.8
Quinlan	3,050	0.3
Royse City	3,020	0.3
Wind Point Park	105	<0.1
d. Septic tanks - Unknown	?	-
e. Known industrial - None	-	-
f. Direct precipitation* -	160,340	17.1
Total	939,115	100.0

2. Outputs -

Lake outlets - Diversions	22,730	
Sabine River	252,140	
Total	274,870	

3. Net annual N accumulation - 664,245 kg.

* See Working Paper No. 175.

D. Non-point Nutrient Export by Subdrainage Area:

Tributary	kg P/km^2/yr	kg N/km^2/yr
Caddo Creek	23	210
Cowleech Fork	175	995
South Fork	48	515

E. Yearly Loads:

In the following table, the existing phosphorus loadings are compared to those proposed by Vollenweider (Vollenweider and Dillon, 1974). Essentially, his "dangerous" loading is one at which the receiving water would become eutrophic or remain eutrophic; his "permissible" 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 "dangerous" and "permissible".

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

	Total Phosphorus		Total Nitrogen	
	Total	Accumulated	Total	Accumulated
grams/m^2/yr	0.91	0.80	6.3	4.5

Vollenweider phosphorus loadings (g/m^2/yr) based on mean depth and mean hydraulic retention time of Lake Tawakoni:

"Dangerous" (eutrophic loading)	0.30
"Permissible" (oligotrophic loading)	0.15

V. LITERATURE REVIEWED

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Moczygemba, John H., 1974. Population and vegetation control and stocking recommendations. Fed. Aid Proj. F-8-R-21, TX Parks & Wildlife Dept., Austin.

Vollenweider, R. A., and P. J. Dillon, 1974. The application of the phosphorus loading concept to eutrophication research. Natl. Res. Council of Canada Publ. No. 13690, Canada Centre for Inland Waters, Burlington, Ontario.

VI. APPENDICES

APPENDIX A

LAKE RANKINGS

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
4801	AMISTAD LAKE	0.013	0.500	371.474	2.042	14.900	0.009
4802	BASTROP LAKE	0.022	0.090	419.917	12.392	15.000	0.007
4803	BELTON RESERVOIR	0.016	0.185	378.312	8.025	15.000	0.007
4804	BRAUNIG LAKE	0.134	0.150	461.625	22.762	14.800	0.062
4805	BROWNWOOD LAKE	0.027	0.100	470.375	4.887	14.400	0.007
4806	LAKE BUCHANAN	0.036	0.250	437.625	8.606	15.000	0.012
4807	CADDO LAKE	0.055	0.070	463.333	14.808	11.400	0.013
4808	CALAVERAS LAKE	0.038	0.060	461.667	22.500	13.000	0.007
4809	CANYON RESERVOIR	0.010	0.450	384.812	2.500	14.800	0.006
4810	LAKE COLORADO CITY	0.042	0.090	473.625	12.675	10.200	0.012
4811	CORPUS CRISTI LAKE	0.113	0.130	475.187	19.756	14.000	0.050
4812	DIVERSION LAKE	0.025	0.080	470.111	15.867	9.000	0.009
4813	EAGLE MOUNTAIN LAKE	0.024	0.070	469.625	5.662	11.000	0.008
4814	FT PHANTOM HILL LAKE	0.060	0.105	474.909	6.317	9.800	0.022
4815	GARZA LITTLE ELM RESERVO	0.045	0.380	475.782	14.156	14.600	0.018
4816	KEMP LAKE	0.023	0.110	455.000	10.217	10.400	0.007
4817	HOUSTON LAKE	0.097	0.260	486.187	16.650	12.400	0.036
4818	LAKE OF THE PINES	0.031	0.090	440.000	12.919	15.000	0.011
4819	LAVON RESERVOIR	0.063	0.180	485.333	5.400	8.800	0.018
4820	LIVINGSTON LAKE	0.196	0.555	465.469	16.112	15.000	0.128
4821	LYNDON B JOHNSON LAKE	0.042	0.420	456.500	8.100	14.900	0.013
4822	MEDINA LAKE	0.010	0.600	403.562	12.944	15.000	0.004
4823	LAKE MEREDITH	0.021	0.070	439.312	3.037	14.900	0.009
4824	PALESTINE LAKE	0.031	0.180	442.625	10.619	14.800	0.010
4825	POSSUM KINGDOM RESERVOIR	0.023	0.070	419.045	9.495	15.000	0.009
4826	SAN ANGELO RESERVOIR	0.098	0.140	481.000	24.675	10.200	0.011
4827	SAM RAYBURN RESERVOIR	0.029	0.150	439.458	6.267	15.000	0.009
4828	E V SPENCE RESERVOIR	0.036	0.080	462.583	11.775	15.000	0.008

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
4829	SOMERVILLE LAKE	0.053	0.115	473.833	24.491	13.000	0.013
4830	STAMFORD LAKE	0.073	0.060	482.714	18.457	10.600	0.012
4831	STILLHOUSE HOLLOW RESERV	0.018	0.160	406.250	3.917	15.000	0.010
4832	TAWAKONI LAKE	0.046	0.100	466.417	18.246	13.200	0.013
4833	TEXARKANA LAKE	0.106	0.120	478.500	19.119	12.400	0.030
4834	TEXOMA LAKE	0.042	0.160	451.321	12.493	15.000	0.018
4835	TRAVIS LAKE	0.018	0.250	389.913	5.595	15.000	0.007
4836	TRINIDAD	0.389	0.110	479.500	24.300	10.000	0.240
4837	TWIN BUTTES RESERVOIR	0.029	0.250	454.917	8.708	14.800	0.009
4838	WHITE RIVER RESERVOIR	0.020	0.110	434.500	4.333	15.000	0.009
4839	WHITNEY LAKE	0.028	0.120	430.500	6.912	15.000	0.008

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
1	4809	CANYON RESERVOIR	445
2	4823	LAKE MEREDITH	441
3	4813	EAGLE MOUNTAIN LAKE	430
4	4816	KEMP LAKE	423
5	4801	AMISTAD LAKE	402
6	4805	BROWNWOOD LAKE	394
7	4802	BASTROP LAKE	393
8	4838	WHITE RIVER RESERVOIR	390
9	4825	POSSUM KINGDOM RESERVOIR	387
10	4835	TRAVIS LAKE	384
11	4803	BELTON RESERVOIR	384
12	4831	STILLHOUSE HOLLOW RESERV	372
13	4812	DIVERSION LAKE	372
14	4808	CALAVERAS LAKE	362
15	4839	WHITNEY LAKE	357
16	4822	MEDINA LAKE	342
17	4827	SAM RAYBURN RESERVOIR	322
18	4828	E V SPENCE RESERVOIR	321
19	4837	TWIN BUTTES RESERVOIR	311
20	4810	LAKE COLORADO CITY	310
21	4824	PALESTINE LAKE	302
22	4818	LAKE OF THE PINES	298
23	4807	CADDO LAKE	297
24	4814	FT PHANTOM HILL LAKE	296
25	4806	LAKE BUCHANAN	261
26	4830	STAMFORD LAKE	259
27	4819	LAVON RESERVOIR	258
28	4832	TAWAKONI LAKE	253

LAKES RANKED BY INDEX NOS.

RANK	LAKE CODE	LAKE NAME	INDEX NO
29	4821	LYNDON B JOHNSON LAKE	238
30	4834	TEXOMA LAKE	217
31	4829	SOMERVILLE LAKE	208
32	4826	SAN ANGELO RESERVOIR	200
33	4833	TEXARKANA LAKE	176
34	4815	GARZA LITTLE ELM RESERVO	173
35	4836	TRINIDAD	169
36	4804	BRAUNIG LAKE	159
37	4811	CORPUS CRISTI LAKE	155
38	4817	HOUSTON LAKE	139
39	4820	LIVINGSTON LAKE	91

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	1D-MIN DO	MEDIAN DISS ORTHO P	INDEX NO
4801	AMISTAD LAKE	95 (36)	5 (2)	100 (38)	100 (38)	39 (14)	63 (21)	402
4802	BASTROP LAKE	79 (30)	76 (28)	82 (31)	47 (18)	17 (0)	92 (34)	393
4803	BELTON RESERVOIR	92 (35)	26 (10)	97 (37)	68 (26)	17 (0)	84 (31)	384
4804	BRAUNIG LAKE	5 (2)	42 (16)	50 (19)	8 (3)	49 (17)	5 (2)	159
4805	BROWNWOOD LAKE	66 (25)	70 (26)	29 (11)	87 (33)	58 (22)	84 (31)	394
4806	LAKE BUCHANAN	47 (18)	21 (7)	74 (28)	63 (24)	17 (0)	39 (14)	261
4807	CADDO LAKE	26 (10)	91 (33)	42 (16)	32 (12)	76 (29)	30 (10)	297
4808	CALAVERAS LAKE	45 (17)	100 (38)	47 (18)	11 (4)	67 (25)	92 (34)	362
4809	CANYON RESERVOIR	99 (37)	8 (3)	95 (36)	97 (37)	49 (17)	97 (37)	445
4810	LAKE COLORADO CITY	39 (14)	76 (28)	26 (10)	42 (16)	88 (33)	39 (14)	310
4811	CORPUS CRISTI LAKE	8 (3)	47 (18)	18 (7)	13 (5)	61 (23)	8 (3)	155
4812	DIVERSION LAKE	68 (26)	83 (31)	32 (12)	29 (11)	97 (37)	63 (21)	372
4813	EAGLE MOUNTAIN LAKE	71 (27)	91 (33)	34 (13)	79 (30)	79 (30)	76 (28)	430
4814	FT PHANTOM HILL LAKE	24 (9)	66 (25)	21 (8)	74 (28)	95 (36)	16 (6)	296
4815	GARZA LITTLE ELM RESERVO	34 (13)	13 (5)	16 (6)	34 (13)	55 (21)	21 (7)	173
4816	KEMP LAKE	76 (29)	61 (22)	55 (21)	55 (21)	84 (32)	92 (34)	423
4817	HOUSTON LAKE	16 (6)	16 (6)	0 (0)	24 (9)	72 (27)	11 (4)	139
4818	LAKE OF THE PINES	54 (20)	76 (28)	66 (25)	39 (15)	17 (0)	46 (17)	298
4819	LAVON RESERVOIR	21 (8)	29 (11)	3 (1)	84 (32)	100 (38)	21 (7)	258
4820	LIVINGSTON LAKE	3 (1)	3 (1)	39 (15)	26 (10)	17 (0)	3 (1)	91
4821	LYNDON B JOHNSON LAKE	39 (14)	11 (4)	53 (20)	66 (25)	39 (14)	30 (10)	238
4822	MEDINA LAKE	99 (37)	0 (0)	89 (34)	37 (14)	17 (0)	100 (38)	342
4823	LAKE MEREDITH	82 (31)	91 (33)	71 (27)	95 (36)	39 (14)	63 (21)	441
4824	PALESTINE LAKE	54 (20)	32 (12)	63 (24)	53 (20)	49 (17)	51 (19)	302
4825	POSSUM KINGDOM RESERVOIR	74 (28)	91 (33)	84 (32)	58 (22)	17 (0)	63 (21)	387
4826	SAN ANGELO RESERVOIR	13 (5)	45 (17)	8 (3)	0 (0)	88 (33)	46 (17)	200
4827	SAM RAYBURN RESERVOIR	59 (22)	39 (15)	68 (26)	76 (29)	17 (0)	63 (21)	322
4828	E V SPENCE RESERVOIR	50 (19)	83 (31)	45 (17)	50 (19)	17 (0)	76 (28)	321

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	INDEX NO
4829	SOMERVILLE LAKE	29 (11)	55 (21)	24 (9)	3 (1)	67 (25)	30 (10)	208
4830	STAMFORD LAKE	18 (7)	97 (37)	5 (2)	18 (7)	82 (31)	39 (14)	259
4831	STILLHOUSE HOLLOW RESERV	88 (33)	37 (14)	87 (33)	92 (35)	17 (0)	51 (19)	372
4832	TAWAKONI LAKE	32 (12)	70 (26)	37 (14)	21 (8)	63 (24)	30 (10)	253
4833	TEXARKANA LAKE	11 (4)	51 (19)	13 (5)	16 (6)	72 (27)	13 (5)	176
4834	TEXOMA LAKE	39 (14)	34 (13)	61 (23)	45 (17)	17 (0)	21 (7)	217
4835	TRAVIS LAKE	88 (33)	21 (7)	92 (35)	82 (31)	17 (0)	84 (31)	384
4836	TRINIDAD	0 (0)	61 (22)	11 (4)	5 (2)	92 (35)	0 (0)	169
4837	TWIN BUTTES RESERVOIR	59 (22)	21 (7)	58 (22)	61 (23)	49 (17)	63 (21)	311
4838	WHITE RIVER RESERVOIR	84 (32)	61 (22)	76 (29)	89 (34)	17 (0)	63 (21)	390
4839	WHITNEY LAKE	63 (24)	51 (19)	79 (30)	71 (27)	17 (0)	76 (28)	357

APPENDIX B

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 C

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR TEXAS 04/22/76

LAKE CODE 4832 TAWAKONI

TOTAL DRAINAGE AREA OF LAKE(SQ KM) 1958.0

TRIBUTARY	SUB-DRAINAGE AREA(SQ KM)	NORMALIZED FLOWS(CMS) JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
4832A1	1958.0	7.22	7.76	15.49	26.65	38.51	10.62	1.56	0.26	1.16	8.55	7.19	10.90	11.35
4832B1	505.0	1.42	1.67	1.10	4.36	4.08	2.12	0.93	0.48	1.36	1.22	1.56	1.19	1.79
4832C1	349.6	2.46	3.85	3.74	4.47	6.06	1.27	0.91	0.31	2.61	2.72	1.47	5.15	2.92
4832ZZ	1103.3	5.44	7.90	7.11	11.81	14.02	4.33	2.44	1.02	5.61	5.64	4.02	9.43	6.55

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 1958.0
SUM OF SUB-DRAINAGE AREAS = 1958.0
TOTAL FLOW IN = 135.27
TOTAL FLOW OUT = 135.87

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4832A1	9	74	24.579	8	0.020				
	10	74	12.573	7	16.169				
	11	74	71.642	8	71.075				
	12	74	30.865	6	30.865				
	1	75	11.242	10	17.670				
	2	75	70.226	14	48.422				
	3	75	15.659	7	13.705				
	4	75	25.627	11	56.634				
	5	75	26.193	13	21.691				
	6	75	31.432	4	24.607	24	16.311		
	7	75	3.370	16	1.388				
	8	75	0.091	27	0.006				
4832B1	9	74	9.345	8	0.028				
	10	74	5.522	7	0.051				
	11	74	15.461	8	0.453				
	12	74	5.748	6	33.131				
	1	75	3.143	10	6.626				
	2	75	19.878	14	0.453				
	3	75	2.973	7	0.396				
	4	75	5.239	11	0.765				
	5	75	11.497	13	0.261				
	6	75	8.495	4	0.249	24	0.238		
	7	75	1.274	16	0.045				
	8	75	0.023	27	0.003				

LAKE CODE 4832 TAWAKONI

MEAN MONTHLY FLOWS AND DAILY FLOWS(CMS)

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
4832C1	9	74	12.686	8	0.040				
	10	74	2.747	7	0.065				
	11	74	10.137	8	0.153				
	12	74	3.568	6	30.299				
	1	75	2.379	10	3.285				
	2	75	11.695	14	0.453				
	3	75	2.209	7	0.453				
	4	75	3.455	11	0.510				
	5	75	8.750	13	0.108				
	6	75	5.862	4	0.074	24	0.091		
	7	75	0.283	16	0.065				
	8	75	0.031	27	0.003				
4832ZZ	9	74	20.388						
	10	74	12.063						
	11	74	33.697						
	12	74	12.544						
	1	75	6.881						
	2	75	43.325						
	3	75	6.513						
	4	75	11.468						
	5	75	25.089						
	6	75	18.576						
	7	75	2.775						
	8	75	0.048						

APPENDIX D

PHYSICAL and CHEMICAL DATA

33 49 01.0 095 54 50.0
TAWAKONI LAKE
48379 TEXAS

11EPALES
4

2111202
0046 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
74/03/09	15 30	0000	13.2		54	140	7.80	71	0.040	0.500	0.030	0.008
	15 30	0005	13.0	9.4		140	7.70	73	0.040	0.500	0.030	0.007
	15 30	0015	12.8	9.7		150	7.60	74	0.060	0.600	0.030	0.007
	15 30	0030	12.7	9.3		140	7.60	73	0.060	0.600	0.030	0.007
	15 30	0042	12.6	9.1		138	7.60	73	0.060	0.600	0.030	0.008
74/05/17	13 50	0000	22.9		45	115	7.95	76	0.060	0.900	0.120	0.013
	13 50	0005	22.1	6.2		168	7.70	76	0.040	0.400	0.170	0.008
	13 50	0015	21.1	4.8		166	7.45	77	0.030	0.400	0.210	0.010
	13 50	0030	20.1	3.0		165	7.30	76	0.030	0.400	0.270	0.013
	13 50	0045	19.8	4.0		164	7.40	35	0.030	0.700	0.070	0.014
74/08/12	10 00	0000	26.5	6.2	72	216	7.67					
	10 00	0005	26.4	5.8		216	7.66					
	10 00	0015	26.3	4.8		216	7.43					
	10 00	0030	26.1	4.4		215	7.33					
	10 00	0045	25.7	1.8		216	7.10					
74/11/01	11 00	0000	20.5	6.4	50	156	7.38	85	0.030	0.400	0.120	0.010
	11 00	0005	20.5	6.4		155	7.24	86	0.020K	0.200	0.120	0.017
	11 00	0015	20.4	7.0		155	7.18	85	0.020K	0.200	0.120	0.020
	11 00	0030	20.3	5.6		155	7.03	84	0.020	0.200	0.170	0.022
	11 00	0041	20.3	6.2		155	7.04	84	0.030	0.300	0.170	0.014

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/03/09	15 30	0000	0.026	5.8	
	15 30	0005	0.028		
	15 30	0015	0.026		
	15 30	0030	0.033		
	15 30	0042	0.028		
74/05/17	13 50	0000	0.029	1.4	
	13 50	0005	0.025		
	13 50	0015	0.028		
	13 50	0030	0.042		
	13 50	0045	0.071		
74/08/12	10 00	0000		61.2	
	10 00	0015			1.0
74/11/01	11 00	0000	0.050	4.3	
	11 00	0005	0.033		
	11 00	0015	0.031		
	11 00	0030	0.036		
	11 00	0041	0.039		

K VALUE KNOWN TO BE
LESS THAN INDICATED.

STORET RETRIEVAL DATE 76/02/11

483202
33 52 29.0 095 59 55.0
TAWAKONI LAKE
48231 TEXAS

11EPALES
4

2111202
0035 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
74/03/09	15 00	0000	14.4		48	144	8.00	71	0.040	0.700	0.030	0.010
	15 00	0006	14.4	9.8		140	8.00	72	0.040	0.600	0.030	0.007
	15 00	0015	14.2	10.0		142	7.95	73	0.040	0.500	0.030	0.007
	15 00	0031	14.2	10.0		144	7.90	73	0.040	0.600	0.030	0.007
74/05/17	14 15	0000	24.2		35	175	8.20	75	0.090	0.700	0.190	0.011
	14 15	0005	24.3	7.6		176	8.10	76	0.020	0.500	0.180	0.009
	14 15	0015	24.1	7.6		177	7.95	76	0.080	0.500	0.180	0.009
	14 15	0031	23.9	7.4		175	7.90	76	0.050	0.500	0.180	0.010
74/08/12	10 35	0000	26.6	7.2	42	218	8.03					
	10 35	0005	26.6	7.0		217	8.03					
	10 35	0015	26.5	7.0		218	8.02					
	10 35	0030	26.4	6.4		218	7.78					
74/11/01	10 30	0000	20.7	8.0	40	153	7.65	84	0.050	0.500	0.020K	0.020
	10 30	0005	20.6	8.0		153	7.54	83	0.060	0.300	0.020K	0.012
	10 30	0015	20.6	8.0		152	7.54	83	0.050	0.400	0.020K	0.011
	10 30	0035	20.5	7.6		152	7.47	85	0.060	0.300	0.020	0.011

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCOT LT REMNING PERCENT
74/03/09	15 00	0000	0.037	5.8	
	15 00	0006	0.034		
	15 00	0015	0.031		
	15 00	0031	0.032		
74/05/17	14 15	0000	0.035	6.4	
	14 15	0005	0.032		
	14 15	0015	0.033		
	14 15	0031	0.033		
74/08/12	10 35	0000		24.8	
	10 35	0012			1.0
74/11/01	10 30	0000	0.045	9.2	
	10 30	0005	0.040		
	10 30	0015	0.038		
	10 30	0035	0.040		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/11

483203
33 51 48.0 096 03 55.0
TAWAKONI LAKE
48231 TEXAS

11EPALES
4

2111202
0022 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
74/03/09	16 30	0000	19.2		12	170	7.70	65	0.050	0.900	0.560	0.052
	16 30	0005	17.7	8.4		160	7.60	65	0.060	0.700	0.370	0.035
	16 30	0018	16.8	8.6		155	7.00	69	0.080	0.700	0.180	0.020
74/05/17	14 35	0000	26.5		15	213	8.20	79	0.060	0.800	0.760	0.032
	14 35	0005	25.3	7.0		195	8.10	78	0.090	0.600	0.450	0.020
	14 35	0016	25.2	7.0		185	8.10	79	0.070	0.500	0.230	0.014
74/08/12	11 05	0000	26.3	5.8	36	226	7.75					
	11 05	0005	26.2	5.8		226	7.70					
	11 05	0015	26.1	5.8		228	7.65					
	11 05	0025	26.0	5.0		235	7.49					
74/11/01	10 05	0000	20.7	7.6	25	164	7.63	83	0.060	0.600	0.020K	0.033
	10 05	0005	20.6	7.6		163	7.63	83	0.050	0.400	0.020K	0.036
	10 05	0015	20.8	6.8		163	7.62	91	0.050	0.400	0.030	0.023
	10 05	0022	20.8	7.6		163	7.54	88	0.040	0.500	0.020	0.034

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/03/09	16 30	0000	0.131	6.2	
	16 30	0005	0.099		
	16 30	0018	0.075		
74/05/17	14 35	0000	0.082	11.0	
	14 35	0005	0.074		
	14 35	0016	0.065		
74/08/12	11 05	0000		29.6	
	11 05	0008			1.0
74/11/01	10 05	0000	0.067	12.3	
	10 05	0005	0.068		
	10 05	0015	0.069		
	10 05	0022	0.069		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/11

483204
33 54 45.0 095 58 58.0
TAWAKONI LAKE
48231 TEXAS

11EPALES 2111202
4 0031 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
74/03/11	11 00	0000	16.6		54	143	8.40	72	0.030	0.700	0.040	0.009
	11 00	0006	16.4	9.2		144	8.20	73	0.030	0.400	0.040	0.010
	11 00	0015	16.1	8.8		141	8.00	73	0.030	0.400	0.040	0.009
	11 00	0027	15.4	8.0		139	7.80	74	0.070	0.400	0.050	0.012
74/05/17	14 50	0000	24.8		20	180	8.20	79	0.030	0.600	0.220	0.013
	14 50	0005	24.8	7.6		177	8.20	79	0.040	0.400	0.230	0.016
	14 50	0015	24.7	7.2		179	8.20	79	0.040	0.400	0.230	0.015
	14 50	0026	24.7	7.4		178	8.15	78	0.040	0.400	0.230	0.013
74/08/12	14 10	0000	26.9	8.0	54	217	8.28					
	14 10	0005	26.7	7.2		216	7.99					
	14 10	0015	26.5	6.6		217	7.85					
	14 10	0025	26.4	6.2		217	7.77					
74/11/01	11 25	0000	21.1	8.0	46	153	7.79	84	0.040	0.300	0.030	0.010
	11 25	0005	21.0	7.8		153	7.63	85	0.050	0.300	0.020K	0.011
	11 25	0015	20.9	7.8		154	7.56	79	0.050	0.400	0.020K	0.019
	11 25	0030	20.9	7.8		153	7.56	83	0.050	0.300	0.020K	0.020

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/03/11	11 00	0000	0.036	10.1	
	11 00	0006	0.033		
	11 00	0015	0.034		
	11 00	0027	0.042		
74/05/17	14 50	0000	0.049	12.9	
	14 50	0005	0.051		
	14 50	0015	0.046		
	14 50	0026	0.052		
74/08/12	14 10	0000		23.5	
	14 10	0012			1.0
74/11/01	11 25	0000	0.041	11.3	
	11 25	0005	0.042		
	11 25	0015	0.046		
	11 25	0030	0.040		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/11

483205
33 57 52.0 096 01 09.0
TAWAKONI LAKE
48231 TEXAS

11EPALES 2111202
4 0017 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
74/03/11	11 30	0000	19.1		32	166	8.25	72	0.040	0.700	0.030	0.017
	11 30	0006	18.9	8.2		164	7.85	71	0.040	0.500	0.040	0.013
	11 30	0013	17.3	7.2		157	7.60	73	0.040	0.500	0.040	0.013
74/05/17	15 10	0000	26.0		15	183	8.85	80	0.020	0.800	0.130	0.015
	15 10	0005	26.0	8.8		182	8.80	80	0.030	0.600	0.120	0.015
	15 10	0011	25.9	8.8		182	8.75	81	0.030	0.700	0.140	0.017
74/08/12	13 50	0000	26.7	8.6	24	226	8.00					
	13 50	0003	26.6	7.0		225	8.00					
74/11/01	10 45	0000	21.7	8.0	29	155	7.99	81	0.030	0.600	0.040	0.022
	10 45	0005	21.4	7.6		153	7.62	82	0.040	0.500	0.020	0.027
	10 45	0015	21.3	6.4		153	7.64	80	0.040	0.400	0.020K	0.031

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/03/11	11 30	0000	0.064	11.0	
	11 30	0006	0.052		
	11 30	0013	0.081		
74/05/17	15 10	0000	0.079	24.1	
	15 10	0005	0.084		
	15 10	0011	0.090		
74/08/12	13 50	0000		40.4	
	13 50	0005			1.0
74/11/01	10 45	0000	0.063	14.2	
	10 45	0005	0.061		
	10 45	0015	0.053		

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/02/11

483206
33 55 30.0 096 04 28.0
TAWAKONI LAKE
48231 TEXAS

11EPALES
4

2111202
0012 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
74/03/11	12 00	0000	19.4	8.0	12	164	8.45	72	0.040	0.700	0.040	0.010
	12 00	0008	17.4	8.6		165	7.85	72	0.040	0.400	0.050	0.011
74/05/17	15 30	0000	26.5		10	233	8.40	98	0.050	0.900	0.590	0.025
	15 30	0007	26.5	7.4		229	8.50	96	0.040	0.700	0.600	0.032
74/08/12	11 30	0000	26.3	8.0	18	231	8.22					
	11 30	0007	26.3	8.0		231	8.24					
74/11/01	11 50	0000	21.5	6.8	18	166	7.80	85	0.050	0.400	0.060	0.030
	11 50	0005	20.7	5.0		186	7.02	81	0.070	0.800	0.440	0.157
	11 50	0011	20.6	5.2		189	7.04	87	0.070	0.900	0.470	0.151

DATE FROM TO	TIME OF DAY	DEPTH FEET	00665 PHOS-TOT MG/L P	32217 CHLRPHYL A UG/L	00031 INCDT LT REMNING PERCENT
74/03/11	12 00	0000	0.072	24.0	
	12 00	0008	0.055		
74/05/17	15 30	0000	0.132	28.5	
	15 30	0007	0.089		
74/08/12	11 30	0000		50.6	
74/11/01	11 50	0000	0.099	9.3	
	11 50	0005	0.243		
	11 50	0011	0.247		

APPENDIX E

TRIBUTARY AND WASTEWATER TREATMENT PLANT DATA

STORET RETRIEVAL DATE 76/03/10

48032A1
32 48 47.0 096 54 55.0 4
SABINE RIVER
48027 15 EMORY
O/LAKE TAWAKONI
HWY 47 BRDG 0.1 MI BELO IRON BRDG DAM
11EPALES 2111204
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
74/09/08	08 45		0.020	0.500	0.025	0.010	0.050
74/10/07	13 20		0.040	0.400	0.020	0.005	0.020
74/11/08	10 00		0.112	0.600	0.025	0.010	0.020
74/12/06	10 30		0.096	0.500	0.104	0.016	0.040
75/01/10	10 20		0.152	0.500	0.032	0.005	0.040
75/02/14	10 45		0.048	0.600	0.028	0.008K	0.040
75/03/07	10 00		0.065	0.700	0.070	0.015	0.070
75/04/11	10 10		0.150	0.550	0.015	0.005	0.030
75/05/13	10 05		0.170	0.350	0.022	0.007	0.020
75/06/04	10 30		0.270	0.400	0.030	0.010	0.030
75/06/24	09 45		0.180	0.650	0.035	0.005	0.020
75/07/16	13 17		0.010	0.675	0.255	0.060	0.210
75/08/27	10 15		0.155	0.800	0.145	0.090	0.170

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/03/10

483281
32 58 35.0 096 08 30.0 4
CADDO CREEK
48 15 QUINLAN
T/LAKE TAWAKONI
2NDARY RD BRDG 2.0 MI SW OF CASH
11EPALES 2111204
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
74/09/08	10	20	0.260	1.100	0.035	0.090	0.175
74/10/07	14	25	0.008	0.400	0.015	0.090	0.118
74/11/08	11	30	0.032	1.000	0.030	0.130	0.180
74/12/06	13	30	0.216	2.200	0.064	0.120	0.540
75/01/10	12	50	1.010	1.000	0.024	0.050	0.200
75/02/14	13	30	0.208	0.700	0.016	0.056	0.110
75/03/07	12	30	0.005	1.250	0.080	0.030	0.090
75/04/11	11	50	1.600	1.400	0.070	0.190	0.200
75/05/13	11	15	0.490	0.700	0.045	0.080	0.140
75/06/04	12	10	1.400	0.950	0.050	0.060	0.140
75/06/24	10	45	0.140	0.950	0.020	0.035	0.120
75/07/16	14	55	0.010	0.800	0.040	0.035	0.110
75/08/27	12	20	0.085	0.500	0.040	0.045	0.110

STORET RETRIEVAL DATE 76/03/10

4832C1
33 04 00.0 096 00 10.0 4
COWLEECH FK SABINE RIV
48 7.5 GREENVLLE SE
T/LAKE TAWAKONI
2NDARY RD BRDG 1.5 MI E OF DIXON
11EPALES 2111204
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
74/09/08	09 30		1.500	1.700	0.270	1.390	1.570
74/10/07	13 55		1.600	1.800	0.925		
74/11/08	10 45		0.736	1.300	0.120	0.700	0.730
74/12/06	11 15		0.120	1.450	0.096	0.184	0.400
75/01/10	10 45		1.030	2.400	1.160	1.280	1.600
75/02/14	11 15		1.350	2.500	1.050	1.250	1.380
75/03/07	10 45		2.300	3.900	1.700	2.300	2.700
75/04/11	11 10		1.150	1.550	0.140	0.390	0.600
75/05/13	10 40		1.400	2.250	1.000	1.250	1.380
75/06/04	11 25		1.350	1.100	0.105	0.740	0.840
75/06/24	10 50		0.850	6.250	3.400	3.050	3.600
75/07/16	14 00		0.860	4.100	2.400	2.750	3.100
75/08/27	11 00		0.360	4.000	2.100	2.750	3.300

STORET RETRIEVAL DATE 76/03/10

483201
32 56 15.0 096 06 57.0 4
SOUTH FK SABINE RIVER
48 15 QUINLAN
T/LAKE TAWAKONI
2NDRY RD BRDG 2.0 MI S OF JCT W HWY 276
11EPALES 2111204
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
74/09/08	10 50		0.136	0.900	0.040	0.065	0.110
74/10/07	14 45		0.024	0.500	0.025	0.055	0.720
74/11/08	12 00		0.128	0.900	0.030	0.120	0.190
75/01/10	13 30		0.096	1.200	0.056	0.088	0.320
75/02/14	15 00		0.390	0.900	0.035	0.040	0.080
75/03/07	13 45		0.190	0.868	0.015	0.023	0.095
75/04/11	12 25		4.600	1.700	0.105	0.050	0.170
75/05/13	11 35		2.700	1.000	0.060	0.045	0.146
75/06/04	12 40		1.500	0.850	0.075	0.050	0.120
75/06/24			0.015	1.550	0.025	0.040	0.140
75/07/16	15 27		0.015	0.750	0.020	0.045	0.100
75/08/27	13 30		0.025	0.900	0.020	0.050	0.160

STORET RETRIEVAL DATE 76/05/03

4832CA TF4832CA 0024000
32 07 35.0 096 04 00.0 4
GREENVILLE
48 7.5 CRESLEND RAN
T/TAWAKONI LAKE 120391
COWLEECH FORK SABINE RIVER
11EPALES 2141204
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
74/10/14	08 00								
CP(T)-			0.360	15.000	3.000		5.000	3.000	2.300
74/10/14	16 00								
74/10/30	08 00								
CP(T)-			0.160	17.750	3.430	8.800	9.850	1.840	1.700
74/10/30	17 00								
74/11/27	08 00								
CP(T)-								1.470	2.490
74/11/27	16 00								
74/12/26	08 00								
CP(T)-			0.240	16.000	3.800	7.200	7.200	2.500	2.600
74/12/26	17 00								
75/01/22	08 00								
CP(T)-			0.080	21.000			9.900	2.070	2.400
75/01/22	16 00								
75/02/19	08 00								
CP(T)-			0.160	18.000	7.175	6.400	9.300	1.300	2.350
75/02/19	16 00								
75/03/19	08 00								
CP(T)-			0.080	14.000	3.300	6.000	7.100	2.500	1.850
75/03/19	16 00								
75/04/17	00 00								
CP(T)-			0.050	12.500	1.300	5.900	6.600	1.670	2.980
75/04/17	08 00								
75/05/15	14 00		0.050	18.500	4.300	7.400	10.500	5.760	2.530
75/06/25	15 30		0.175	17.000	5.050	1.000	10.000	2.090	2.950
75/07/24	15 30		0.050	10.500	1.800	8.700	9.600	2.120	2.180
75/08/21	15 30		0.375	14.000	1.700	7.300	8.100	2.130	2.140
75/09/18	15 00		0.475	26.000	3.100	8.600	10.500	1.950	2.050

STORET RETRIEVAL DATE 76/03/10

4832WA P04632WA P001100
33 03 30.0 096 13 50.0 4
CADDO MILLS
48 7.5GREENVILLE SW
T/TAWAKANI LAKE
WEST CADDO CREEK
11EPALES 2141204
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
74/09/05	08 00		0.159	5.300	0.050	2.000	2.500	0.052	0.048
74/10/04	10 30		0.040	3.730	0.050K	1.300	1.375	0.038	0.045
74/11/13	11 30		1.040	3.600	0.110	4.600	4.600	0.049	0.042
74/12/10	20 00		1.440	3.500	0.320	4.500	4.600	0.044	0.044
75/01/27			0.400	12.000	0.245	4.850	6.400	0.049	0.049
75/02/11	09 00		0.400	8.500	0.160	5.000	5.700	0.053	0.050
75/03/25	09 30		0.240	9.000	0.095	5.000	6.000	0.045	0.052
75/06/23	10 00		0.100	11.000	0.025K	0.830	1.800	0.057	0.074
75/07/14	10 00		0.150	7.600	0.042	1.280	1.950	0.052	0.052
75/08/14	08 00		0.050	8.000	0.025K	1.100	1.800	0.032	0.115
75/12/09	11 00		0.350	13.000	0.050	8.150	10.500	0.052	0.052

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/03/10

4832XA PD4832XA P000736
33 17 30.0 096 11 00.0 4
CELESTE
48 7.5 CELESTE
T/LAKE TAWAKONI
BRANCH TO SABINE RIVER
11EPALES 2141204
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
74/09/20	08	30	0.720	7.000	0.140	4.300	5.100	0.064	0.069
74/10/21	08	40		9.650	0.050K	2.200	2.950	0.052	0.063
74/11/15	09	20	0.800	8.000	0.050K	3.500	4.000	0.052	0.060
74/12/16	08	20	1.120	9.000	0.180	3.600	4.000	0.052	0.070
75/01/15	10	20	1.280	9.600	0.310	3.800	5.000	0.052	0.070
75/02/20	08	30	1.040	5.670	0.254	5.650	7.250	0.052	0.163
75/03/21	10	15	1.360	11.000	0.130	4.900	6.700	0.052	0.063
75/04/24	09	45	0.600	10.500	0.180	4.600	5.900	0.052	0.055
75/05/19	08	30	0.250	5.800	0.050K	3.425	4.500	0.052	0.055
75/06/27	10	20	0.075	10.000	0.025K	2.300	2.650	0.052	0.061
75/07/22	09	20	0.025	6.400	0.025K	3.000	3.700	0.052	0.058
75/08/28	13	40	0.050	15.000	0.056	3.500	5.000	0.052	0.053

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/03/10

4832YA AS4832YA P000844
32 55 00.0 096 07 00.0 4
QUINLAN
48 15 QUINLAN
T/LAKE TAWAKONI
NUFALS BR. TO JONES CREEK
11EPALES 2141204
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
74/08/29	16	45	0.320	27.000	4.600	9.600	18.000	0.100	0.070
74/09/13	09	00	1.260	7.700	0.066	1.500	2.600	0.100	0.071
74/10/07	08	45	6.600	2.400	0.100	8.500	8.700	0.040	0.070
74/10/30	08	10	0.480	9.000	0.700	3.800	3.900	0.060	0.070
74/11/11	09	45	3.520	3.000	0.050K	3.300	3.500	0.077	0.060
74/12/05	09	30	11.200	9.300	0.050K	7.700	7.700	0.550	0.650
75/01/09	10	30	3.840	14.000	0.760	5.900	7.600	0.068	0.074
75/04/29	11	45	1.300	18.000	3.400	9.000	12.500	0.075	0.074
75/05/20	09	30	0.550	8.900	0.140	5.200	5.200	0.069	0.075
75/06/25	09	20	0.050	15.750	6.300	14.500	15.500	0.068	0.072

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/03/10

48322A 0048322A P0020000
32 58 00.0 096 20 00.0 4
POND CREEK
48 7.5 ROYSE CITY
T/TAWAKANI LAKE
POND CREEK SOUTH FORK SABINE RIVER
11EPALES 2141204
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
74/11/08	13 00		14.800	1.700	0.050K	6.900	6.950	0.090	0.110
74/12/20	09 30		19.200	3.200	0.050K	8.000	8.700	0.134	0.163
75/01/16	14 30			1.400	0.079		8.100	0.175	0.276
75/03/26			30.000	1.100	0.270	9.810	9.900	0.156	0.179
75/04/17	14 00		7.500	1.400	0.050K	6.500	6.500	0.130	0.146
75/06/02	14 00		8.300	0.500K	0.050K	5.000	5.400	0.110	0.190
75/08/14	13 45		5.800	4.000	0.555	9.600	9.600	0.087	0.105
75/08/28	11 00		10.500	1.400	0.220	11.000	12.000	0.072	0.084
75/09/16	14 30		10.500	1.300	0.100	11.500	12.000	0.072	0.083

K VALUE KNOWN TO BE
LESS THAN INDICATED

STORET RETRIEVAL DATE 76/03/10

483221 EA483221 P
32 57 25.0 096 00 00.0 4
WIND POINT PARK
48231 15 QUINLAN TX
D/TAWAKONI LAKE
TAWAKONI LAKE
11EPALES 2141204
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
74/10/15	11 00								
CP(T)-			24.000	20.000	14.000	11.000	54.000	0.001	0.001
74/10/15	16 00								
74/10/18	11 00								
CP(T)-			43.000	16.000	14.500	11.000	11.800		0.001
74/10/18	16 00								
74/11/18	11 00								
CP(T)-			22.400	10.000	5.375	6.100	7.100	0.0002	0.002
74/11/18	16 00								
74/12/18	11 00								
CP(T)-			13.600	6.900	4.000	3.900	4.200	0.0001	0.001
74/12/18	16 00								
75/01/20	11 15								
CP(T)-			4.640	30.000	3.000	3.000	4.100	0.001	0.004
75/01/20	15 45								
75/02/18	11 00								
CP(T)-			7.500	18.300	6.250	2.400	2.700	0.00003	0.0001
75/02/18	16 00								
75/03/18	11 00								
CP(T)-			1.000	22.000	12.500	1.880	4.700	0.00002	0.0003
75/03/18	15 30								
75/04/18	11 00								
CP(T)-			36.800	16.500	12.000	7.000	7.000	0.0002	0.001
75/04/18	16 00								
75/05/19	11 00								
CP(T)-			44.000	24.000	21.000	10.000	10.000		0.003
75/05/19	16 00								
75/06/18	10 00								
CP(T)-			30.000	6.400	5.250	10.500	11.000	0.0005	0.003
75/06/18	16 00								
75/07/21	10 45								
CP(T)-			3.800	17.000	7.200	7.700	8.000	0.0004	
75/07/21	16 00								
75/08/18	10 30								
CP(T)-			25.000	22.000	20.000	8.700	9.300	0.0005	0.002
75/08/18	15 45								

STORET RETRIEVAL DATE 76/03/10

4ø3221 EA4ø3221 P
32 57 25.0 096 00 00.0 4
WIND POINT PARK
48231 15 QUINLAN TX
D/TAWAKONI LAKE
TAWAKONI LAKE
- 11EPALES 2141204
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
75/09/22	10 00								
CP(T)-			26.000	7.100	1.100	6.800	7.200	0.00001	0.0002
75/09/22	15 30								