

**TEXAS WATER DEVELOPMENT BOARD**

**REPORT 120**

**BIOCHEMICAL-OXYGEN-DEMAND, DISSOLVED-OXYGEN,  
SELECTED-NUTRIENTS, AND PESTICIDE RECORDS OF  
TEXAS SURFACE WATERS, 1969 WATER YEAR**

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Prepared by the U.S. Geological Survey  
in cooperation with the  
Texas Water Development Board

September 1970

## TEXAS WATER DEVELOPMENT BOARD

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Published and distributed  
by the  
Texas Water Development Board  
Post Office Box 13087  
Capitol Station  
Austin, Texas 78711

## FOREWORD

During the course of formulating a comprehensive plan for the optimum development, distribution, and use of the water resources of the State, it became apparent to the Texas Water Development Board that data on many important parameters which influence the overall water-quality characteristics of streams were lacking in many areas of the State. An extensive cooperative program between the Board and the U.S. Geological Survey to continuously monitor the chemical quality of Texas streams has been underway for many years, and the network of monitoring stations has been substantially expanded during the past decade. This network, however, provides data only on specific inorganic chemical constituents of the water. Other parameters, such as nutrients, pesticides, and various physical properties are not determined. These characteristics can profoundly influence the use of the water resource, as well as the ecological balance in streams and associated reservoirs.

During the period 1957 through 1965, the Texas State Department of Health in cooperation with the Texas Parks and Wildlife Department operated a network of approximately 272 sampling stations in the State at which "grab" samples (not depth integrated) were collected at least once a month and subsequently forwarded to the State Department of Health laboratory in Austin for analyses. Some of these stations were located at or near existing stream gages operated by the U.S. Geological Survey in its cooperative program with the Board; however, flow data were not reported as a part of this sampling program. The parameters measured and reported under this program included total dissolved solids, chloride, sulfate, chlorine demand, dissolved oxygen, biochemical oxygen demand, and pH. This program, although of great value in pollution abatement activities, did not provide information on additional physical and quality parameters needed for comprehensive stream quality evaluation. With the passage of the Texas Water Quality Act of 1967, certain water pollution control activities of the State Department of Health were transferred to the newly created Texas Water Quality Board. This water-quality monitoring program was thus terminated, to be subsequently replaced by the Texas Water Quality Board's own network of water-quality surveillance stations.

It was during that interim period that the Texas Water Development Board initiated the cooperative data-collection program with the U.S. Geological Survey

for which 1969 water year records are included in this report. Under this program, data are collected on many important water quality parameters other than inorganic chemical constituents. These include nitrate and phosphate, important nutrients which may under certain conditions produce excessive biological growths and associated oxygen depletion, undesirable taste and odor problems, and other nuisance conditions. Also included in the program is identification, at strategically selected stations, of most of the widely used pesticides.

This report presents the results of the second year of operation of the network, the initial year's data having been previously published as Texas Water Development Board Report 108. A sampling year is based on the standard U.S. Geological Survey "water year," which runs from October 1 through September 30 and is designated by the calendar year in which it ends. (Water year 1969 extends from October 1, 1968 to September 30, 1969.)

The present program is continuously being improved, through the addition of more parameters (ammonia nitrogen and nitrate nitrogen were added during the 1969 water year) and increasing capability and accuracy of analytical techniques as a result of technological advances. Additional pesticides have been added to those reported during the 1968 water year.

The results of pesticide analyses during the first two years of the sampling program indicate the difficulty in obtaining reasonably reliable data on pesticide loads carried by streams. Most pesticides commonly accumulate in soils and adhere to sediment particles which are carried into streams largely during periods of high runoff. Thus, frequency and timing of sampling strongly influence the results obtained from a routine data-collection program. In addition, even though the pesticide concentrations determined are indicative of the concentrations carried by both the suspended sediment load of the stream and the water (as a result of utilizing the depth-integrated sampling technique), quantities of pesticides as well as other organic materials which may have accumulated on the bed of the stream at the sampling site are not detected. Under the present program, the recorded absence of detectable pesticide concentrations at many stations probably accurately reflects such conditions. At other stations, the frequency and timing of sampling and the sampling technique limit accurate assessment of pesticide loads and other organic

material contributed to the stream. This assumption is supported by the comparatively high pesticide residues frequently measured by the Texas Parks and Wildlife Department in organs and tissues of some marine organisms such as fish and shellfish, many of which accumulate or "store" pesticide residues through continued intake of water and food which may contain comparatively low pesticide concentrations. Because of this, bottom sediment samples will be collected and analyzed at many stations in the network during the 1970 water year.

As stressed in the report, the data presented are representative of the condition of the stream only at the sampling site and under the conditions of flow and climate indicated. Through repetitive sampling, however,

sufficient data can be accumulated which, through accepted mathematical equations and predictive techniques, provide reasonably reliable evaluations of the quality and condition of the streams between sampling sites. The network is designed to provide additional data on the physical and water-quality characteristics of Texas streams at critical locations such as near points of inflow and outflow from existing reservoirs and near sites where new reservoirs are proposed. Where continued data collection shows evidence of deteriorating stream conditions, this program provides additional data for pollution abatement activities and implementation of appropriate water-quality management programs by State and local agencies with statutory responsibilities in this area.

TEXAS WATER DEVELOPMENT BOARD

## TABLE OF CONTENTS

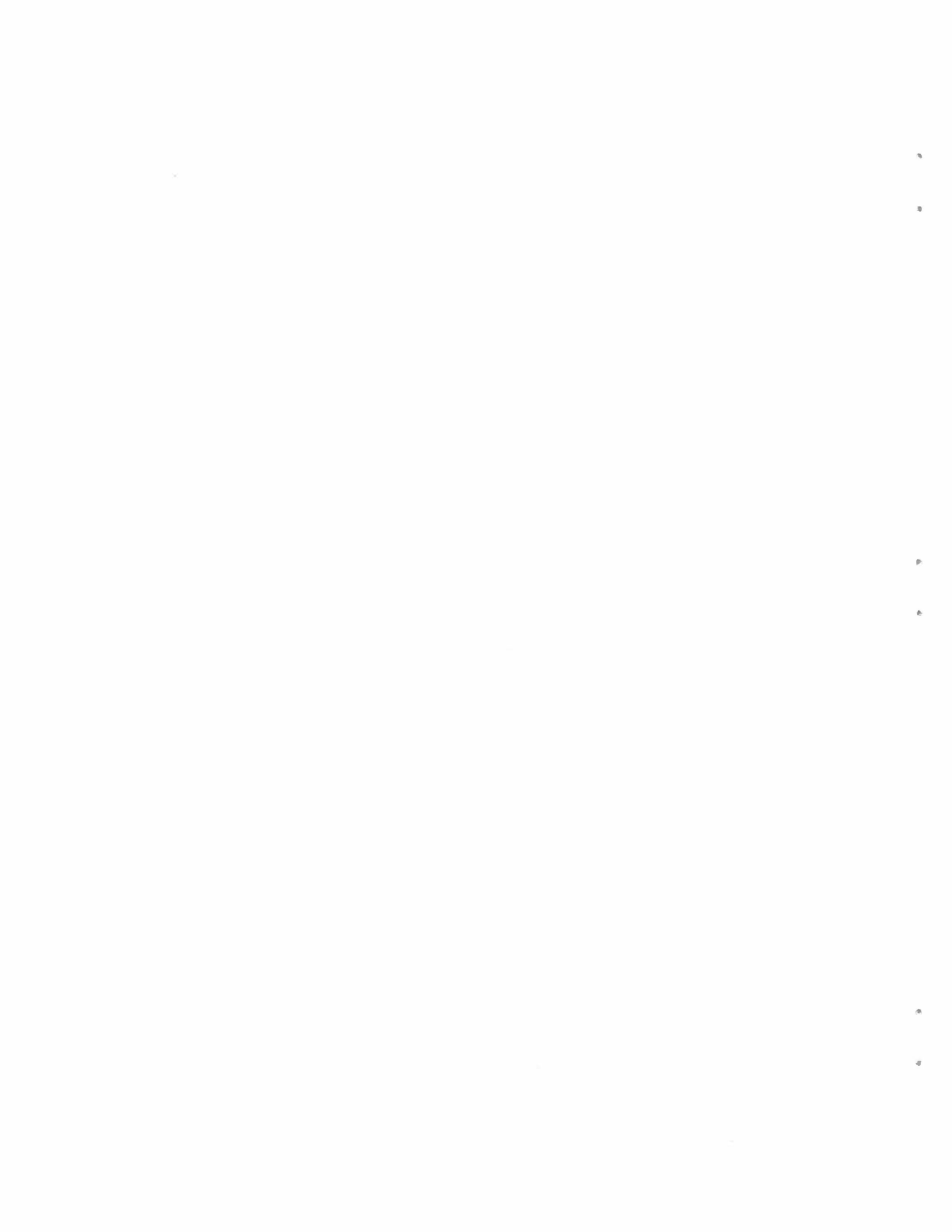
	Page
INTRODUCTION .....	1
DEFINITION OF TERMS AND ABBREVIATIONS .....	1
COLLECTION OF SAMPLES .....	3
ANALYTICAL PROCEDURES .....	3
REFERENCES CITED .....	4

### TABLES

1. Biochemical-Oxygen-Demand and Selected-Nutrients Records of Texas Surface Waters, 1969 Water Year .....	5
2. Pesticides in Texas Surface Waters, 1969 Water Year .....	17

### FIGURE

1. Map of Texas Showing Data-Collection Sites for Biochemical-Oxygen-Demand, Dissolved-Oxygen, Nutrients, and Pesticide Data, 1969 Water Year .....	23
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# BIOCHEMICAL-OXYGEN-DEMAND, DISSOLVED-OXYGEN, SELECTED-NUTRIENTS, AND PESTICIDE RECORDS OF TEXAS SURFACE WATERS, 1969 WATER YEAR

## INTRODUCTION

A network of daily and periodic chemical-quality stations on streams in Texas is operated by the U.S. Geological Survey in cooperation with the Texas Water Development Board and with other State, Federal, and local agencies. Before 1968, analyses of water from this network usually included only the principal inorganic constituents and related properties. Other water-quality parameters or constituents may profoundly influence the water resource and the ecological balance in streams and reservoirs. Therefore, to supplement the information being obtained on the inorganic quality of the surface-water resources of the State, the Geological Survey in cooperation with the Texas Water Development Board began in January 1968 the periodic determination of BOD (biochemical oxygen demand), dissolved oxygen, and selected nutrients and pesticides at strategically located sites on most of the principal streams. Records of these periodic determinations through September 1968 were compiled by Dupuy, Manigold, and Schulze (1970).

During the 1969 water year (October 1968 through September 1969), the periodic sampling program for BOD, dissolved oxygen, nutrients, and pesticides was expanded to include sites on streams in the urban areas of Houston and San Antonio. Locations of sites included in the program during the 1969 water year are shown on Figure 1. Most of the sites are at stream-gaging stations where additional water-quality data are collected on a continuous, daily, or periodic basis.

BOD, dissolved-oxygen, and nutrients records for the 1969 water year are given in Table 1; pesticides records are given in Table 2. Because these constituents or properties are nonconservative—that is, they are affected by several factors such as biological activity, sunlight intensity, air and water temperatures, and stream-channel characteristics and associated water depth and velocities—the records in Tables 1 and 2 for a particular stream are representative of conditions only at the sampling sites and during the times of sampling. However, data accumulated through repetitive sampling

at strategic sites on a stream should be sufficiently representative to allow for reliable evaluations of the stream's quality.

## DEFINITIONS OF TERMS AND ABBREVIATIONS

The terms and abbreviations for water-quality and hydrologic data in this report are defined as follows:

*Discharge* represents the total fluid measured in the stream.

*Cubic feet per second* (cfs) is a unit expressing rates of discharge. One cubic foot per second is equal to the discharge of a stream of rectangular cross section, 1 foot wide and 1 foot deep, flowing water at an average velocity of 1 foot per second.

*Milligrams per liter* (mg/l) is a unit for expressing the weight of solute (in milligrams) per unit volume (liter) of solution.

*Micrograms per liter* ( $\mu\text{g/l}$ ) is a unit for expressing the weight of solute (in micrograms) per unit volume (liter) of solution. One  $\mu\text{l}$  is equal to 0.001 mg/l.

*Specific conductance* is a measure of the ability of a water to conduct an electrical current and is expressed in micromhos per centimeter at 25°C. Because the specific conductance is related to the number and types of ions in solution, it can be used for approximating the dissolved-solids content of the water. The following general relation is applicable:

Specific conductance  $\times$  (0.65  $\pm$  0.05) = mg/l dissolved solids.

*Nutrients* are substances required to promote and sustain life. Excessive nutrients tend to enrich water and may cause undesirable weed and algal growths and associated nuisances. In this report consideration has been limited to the most significant nutrients, nitrogen and phosphorus.

*Biochemical oxygen demand* (BOD) is a measure of the amount of oxygen required by aerobic bacteria while stabilizing decomposable organic matter. Thus, the determination of BOD provides an indication of the quantity of organic material in the water at the sampling point. Because complete stabilization may require a period too long for practical purposes, the 5-day BOD test has been accepted as standard. The BOD data presented in this report are based on the standard 5-day BOD test.

*Dissolved oxygen* (DO) in surface water is necessary for the support of aquatic life and the aerobic decomposition of organic material, and thus is one of the most important indicators of the biological, chemical, or sanitary quality of the water.

*Percent saturation* of dissolved oxygen is the ratio of the quantity of oxygen dissolved in a water at a given temperature and salinity to the maximum equilibrium quantity of oxygen dissolved in the water when exposed to water-saturated air.

*Pesticides* include insecticides and herbicides.

*Insecticides* are substances or a mixture of substances intended to prevent, destroy, or repel insects. Technical names for insecticides analyzed for are:

*Aldrin* should contain not less than 95 percent of 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro-1,4-endo-exo-5,8-dimethanonaphthalene.

*Chlordane* 1,2,4,5,6,7,8,8-octachloro-3a,4,7,7a-tetrahydro-4,7-methanoindane

*DDD* 1,1-dichloro-2,2-bis (*p*-chlorophenyl) ethane

*DDE* 1,1-dichloro-2,2-bis (*p*-chlorophenyl) ethylene

*DDT* 1,1,1-trichloro-2,2-bis (*p*-chlorophenyl) ethane

*Dieldrin* should contain not less than 85 percent of 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-exo-5,8-dimethanonaphthalene.

*Endrin* 1,2,3,4,10,10-hexachloro-6,7-epoxy-1,4,4a,5,6,7,8,8a-octahydro-1,4-endo-endo-5,8-dimethanonaphthalene

*Heptachlor* 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-4,7-methanoindene

*Heptachlor epoxide* 1,4,5,6,7,8,8-heptachloro-2,3-epoxy-3a,4,7,7a-tetrahydro-4,7-methanoindan

*Lindane* 1,2,3,4,5,6-hexachlorocyclohexane, 99 percent or more of gamma isomer

$\alpha$ -*BHC* Alpha-1,2,3,4,5,6-hexachlorocyclohexane

*Methyl parathion* *O,O*-dimethyl *O-p*-nitrophenyl phosphorothioate

*Parathion* *O,O*-diethyl *O-p*-nitrophenyl phosphorothioate

*Toxaphene* Chlorinated camphene containing 67 to 69 percent chlorine

*Herbicides* are substances or a mixture of substances intended to control or destroy any vegetation. Technical names for herbicides analyzed for are:

*2,4-D* 2,4-dichlorophenoxyacetic acid

*2,4,5-T* 2,4,5-trichlorophenoxyacetic acid

*Silvex* 2-(2,4,5-trichlorophenoxy) propionic acid



## COLLECTION OF SAMPLES

Samples for BOD were refrigerated until analysis was begun (within 4 days after collection). Samples for nutrient analysis were collected in 1-liter polyethylene bottles and immediately treated with chloroform. A depth-integrated sample was collected with a BOD sampler (provides for a threefold displacement of water in a BOD bottle without aeration) for streamside measurement of dissolved oxygen and temperature. Depth-integrated samples for pesticide analysis were collected in 1-quart Boston round glass bottles and sealed with a Teflon-lined screw cap. Two samples, one for insecticide analysis and the other for herbicides, were collected at each station.

## ANALYTICAL PROCEDURES

The BOD was determined by incubating the samples at a temperature of 20°C for 5 days and measuring the decrease in dissolved oxygen (American Public Health Association and others, 1965, p. 415-421).

Dissolved oxygen was measured in the field with a temperature-compensated instrument. Calibration of the instrument was checked frequently by the Winkler method (azide modification) using saturated distilled water (Rainwater and Thatcher, 1960, p. 233-235). Temperature was measured with a glass thermometer at the time of sampling and is reported in degrees Celsius.

A modification of the persulfate digestion method developed by Gales and others (1966) was used for the determination of total inorganic and organic phosphorus as phosphate (PO<sub>4</sub>).

A modification of the diazotization method (Rider and Mellon, 1945, p. 76) was used for the determination of nitrite (NO<sub>2</sub>). The methods used for the determination of ammonia (NH<sub>4</sub>) and nitrate (NO<sub>3</sub>) are those described by Rainwater and Thatcher (1960, p. 211-226). Where no ammonia or nitrite values are reported in Table 1, the values reported for nitrate include all inorganic forms of nitrogen as nitrate.

Water for pesticide determinations was normally received in the laboratory within 3 days after sampling and was stored at about 1°C until analysis was begun, usually 4 to 7 days after receipt. Methods for pesticide analysis were those developed in the U.S. Geological Survey laboratories. Suspended solids were not removed prior to extraction. Insecticides were extracted from the samples with hexane and analyzed by electron capture gas chromatography (Lamar and others, 1966, p. 187-199). Samples for herbicide analysis were acidified and extracted with ether. The herbicides were converted to their methyl esters to facilitate analysis and were analyzed by electron capture gas chromatography. The methyl ester values were converted to the equivalent acid values for reporting (Goerlitz and Lamar, 1967, p. 1-21).

Some data are included for five insecticides that had not been previously reported in the periodic sampling program. In late October 1968, chlordane was added to the analytical scheme. Toxaphene was identified in one sample received from Greens Bayou in Houston (8-0760). Alpha-BHC was found in several samples and the concentration is included under lindane in Table 2. Although insecticides of primary interest in the periodic program are of the chlorinated type, one sample from the Arroyo Colorado at El Fuste (8-4703) was screened for methyl and ethyl parathion, and results were positive.

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Table 1.--Biochemical-oxygen-demand and selected nutrients records of Texas surface waters, 1969

(Results in milligrams per liter except as indicated)

Date	Time (24 hour)	Discharge (cfs)	Ammonia (NH <sub>4</sub> )	Nitrate (NO <sub>3</sub> )	Nitrite (NO <sub>2</sub> )	Phosphate (PO <sub>4</sub> )	Specific conductance (micromhos at 25°C)	pH (field)	Tem- pera- ture (°C)	Dissolved oxygen (DO)		Bio- chem- ical oxygen demand (BOD)
										mg/l	Per- cent sat- ura- tion	
7-2274.7. CANADIAN RIVER NEAR TASCOSA, TEXAS (35°31'10", 102°15'30")												
Jan. 7, 1969....	1645	22		1.4		0.04	4,260	--	11	--	--	0.7
Feb. 10.....	1540	5.3		.4		.16	4,230	--	13	--	--	1.2
June 5.....	1145	35		2.0		3.3	1,990	--	26	--	--	1.0
Aug. 6.....	1215	63		.4		.15	1,390	--	27	--	--	1.4
Aug. 27.....	1000	2,200		1.5		.75	910	8.0	22	6.6	75	5.1
Sept. 5.....	1100	1,010		.6		.09	936	--	23	--	--	2.8
Sept. 23.....	1515	800		--		.26	960	7.9	24	7.0	82	1.7
7-2275. CANADIAN RIVER NEAR AMARILLO, TEXAS (35°28'10", 101°52'45")												
Jan. 7, 1969....	1220	32		23		6.8	3,340		3			4.8
Feb. 10.....	1020	11		82		24	2,590		4			23
June 5.....	1650	39		10		.14	2,860		32			5.7
Aug. 6.....	1850	106		5.0		.11	1,550		30			3.1
Aug. 26.....	1600	1,960		3.6		1.5	928		25	6.8	81	4.2
Sept. 5.....	1515	954		2.3		.16	931		24			1.4
7-2280. CANADIAN RIVER NEAR CANADIAN, TEXAS (35°56' , 100°22' )												
Nov. 21, 1968...	1335	61		4.4		0.12	2,400		13			1.1
Dec. 19.....	1255	29		4.5		.14	2,480		1			1.3
Mar. 6, 1969....	1555	270		8.2		.33	2,520		10			7.6
April 10.....	1200	22		2.6		.84	1,100		20			2.5
June 17.....	1315	540		1.1		.68	1,470		20			.8
Aug. 26.....	1120	280		1.3		.30	1,350		24	7.0	81	5.7
7-3127. WICHITA RIVER NEAR CHARLIE, TEXAS (34°03'20", 98°17'41")												
Dec. 9, 1968....	1607	98		9.0		4.2	4,950	8.0	7	10.9	93	1.4
Feb. 6, 1969....	1040	77		16		7.5	4,050	7.8	10	10.5	96	6.4
June 4.....	1405	226		4.3		3.2	3,690	8.0	22	9.3	107	5.8
Aug. 14.....	1114	117		1.8		2.9	4,270	8.2	31	7.2	96	6.2
Aug. 25.....	1405	220		3.3		2.4	2,960	7.3	26	4.6	57	3.4
7-3355. RED RIVER AT ARTHUR CITY, TEXAS (33°52'30", 95°30'10")												
Oct. 8, 1968....	1145	1,970		0.0		0.12	1,080	7.7	19	9.0	96	2.0
Dec. 10.....	0800	3,200		.0		.18	889	8.0	6	11.5	95	.7
Feb. 3, 1969....	1215	20,600		.2		.20	522	7.4	9	11.9	106	1.9
April 9.....	2215	11,400		.3		.20	1,310	7.9	18	9.2	100	1.6
June 2.....	1335	13,600		1.3		.16	1,240	7.8	23	7.7	89	1.0
July 9.....	0920	2,800		1.0		.20	1,140	7.7	30	5.8	76	2.5
Aug. 13.....	1705	3,390		.1		.20	1,140	8.2	30	9.0	118	2.7
7-3368.2. RED RIVER NEAR DeKALB, TEXAS (33°41'15", 94°41'39")												
Oct. 8, 1968....	1000	6,100		0.0		0.16	1,220	7.8	18	9.6	102	1.9
Dec. 10.....	1115	6,400		.8		.12	1,660	7.7	7	13.0	110	.8
Feb. 3, 1969....	1535	44,200		.2		.20	314	7.6	10	10.5	96	1.9
April 9.....	1845	11,300		.0		.12	1,060	7.7	20	9.3	105	1.9
June 2.....	1600	18,300		1.5		.26	1,040	7.7	25	7.7	92	1.3
July 8.....	1740	3,300		.4		.28	1,090	7.7	32	7.4	100	2.5
Aug. 13.....	1437	3,640		.2		.16	1,240	8.1	30	8.1	116	3.2
7-3370. RED RIVER AT INDEX, ARKANSAS (33°33'07", 94°02'28")												
Oct. 7, 1968....	1835	4,340		0.0		0.23	849	7.7	20	9.4	102	2.6
Dec. 10.....	1300	8,080		.0		.12	630	7.9	8	12.1	105	1.2
Feb. 3, 1969....	1700	65,900		.3		.32	237	7.4	10	10.3	94	1.6
April 9.....	1450	14,800		.0		.15	1,150	7.9	21	9.3	107	1.7
June 2.....	1720	21,800		.6		.10	1,010	7.8	26	7.2	87	1.3
July 8.....	1625	6,260		1.2		.30	1,110	8.0	33	6.9	95	2.1
Aug. 13.....	1245	3,630		.2		.24	1,200	7.9	29	9.3	119	4.1

Table 1.--Biochemical-oxygen-demand and selected nutrients records of Texas surface waters, 1969--continued

(Results in milligrams per liter except as indicated)

Date	Time (24 hour)	Discharge (cfs)	Ammonia (NH <sub>4</sub> )	Nitrate (NO <sub>3</sub> )	Nitrite (NO <sub>2</sub> )	Phosphate (PO <sub>4</sub> )	Specific conductance (micromhos at 25°C)	pH (field)	Tem- pera- ture (°C)	Dissolved oxygen (DO)		Bio- chem- ical oxygen demand (BOD)
										mg/l	Per- cent sat- ura- tion	
7-3432. SULPHUR RIVER NEAR TALCO, TEXAS (33°23'20", 95°07'50")												
Oct. 8, 1968....	1310	20		0.0		0.15	591	7.4	20	8.0	86	1.5
Dec. 10.....	1000	132		.0		.38	1,090	7.8	6	12.0	99	1.4
Feb. 3, 1969....	1400	21,300		.5		.46	188	7.3	10	11.3	104	3.2
April 9.....	2010	118		.2		.20	662	7.6	21	8.0	92	2.7
June 2.....	1440	136		.8		.14	452	7.5	26	6.2	76	2.2
July 8.....	1900	11		.6		.26	658	7.4	32	5.2	70	2.0
Aug. 13.....	1545	2.2		.2		.18	795	7.6	31	6.1	81	1.3
7-3460.7. LITTLE CYPRESS CREEK NEAR JEFFERSON, TEXAS (32°42'46", 94°20'44")												
Oct. 7, 1968....	1645	55		0.0		0.19	154	6.4	19	7.3	78	0.9
Dec. 10.....	1500	800		.4		.20	149	6.3	8	11.1	97	1.0
Feb. 4, 1969....	0805	560		.5		.24	206	6.5	8	8.6	75	1.0
April 9.....	1215	2,570		.4		.23	109	6.4	20	6.5	74	1.7
June 2.....	1935	408		2.9		.36	169	6.6	24	5.3	62	1.6
July 8.....	1425	9.0		2.1		.54	237	6.7	30	3.5	46	1.3
Aug. 13.....	0930	.13		1.6		.22	238	6.7	28	2.9	37	1.6
8-0175. SABINE RIVER NEAR EMORY, TEXAS (32°46'23", 95°47'56")												
Oct. 8, 1968....	1500	0.8		0.0		0.24	243	7.0	22	7.7	88	4.1
Dec. 11.....	0800	5.0		.0		.16	1,220	7.1	10	8.9	82	1.7
Feb. 4, 1969....	1330	90		.0		.20	185	7.6	10	11.2	103	2.0
April 8.....	1440	850		.0		.15	213	7.4	15	11.5	118	1.8
June 3.....	1100	850		5.0		.12	195	7.4	23	6.6	76	1.9
July 7.....	1540	3.0		.6		.30	262	7.3	31	6.5	87	2.1
Aug. 12.....	1515	.2		1.2		.44	292	8.1	31	9.8	131	7.7
8-0200. SABINE RIVER NEAR GLADEWATER, TEXAS (32°32' , 94°57' )												
Oct. 7, 1968....	1435	114		0.0		0.24	262	6.7	20	7.4	80	1.0
Dec. 10.....	1705	2,360		1.0		.28	241	6.6	8	10.7	93	1.5
Feb. 4, 1969....	1115	3,150		.5		.26	297	6.8	11	9.3	87	2.4
April 9.....	0940	6,040		.0		.23	218	7.1	20	6.9	78	2.0
June 3.....	0920	5,720		.8		.22	215	7.0	24	4.5	53	1.7
July 8.....	1140	234		1.2		.30	405	7.1	30	5.4	71	2.1
Aug. 12.....	1655	26		.7		.22	280	7.1	32	2.4	32	1.7
8-0220. SABINE RIVER NEAR TATUM, TEXAS (32°22'11", 94°27'28")												
Oct. 7, 1968....	1550	169		0.1		1.1	485	6.7	22	3.8	43	18
Dec. 10.....	1600	3,660		.8		.36	1,500	6.6	9	10.0	89	1.9
Feb. 4, 1969....	0905	3,050		.2		.32	430	6.8	11	7.7	72	2.3
April 9.....	1110	11,500		.0		.22	209	7.3	20	5.9	67	1.8
June 3.....	0745	9,280		.7		.24	220	7.8	25	4.5	54	1.5
July 8.....	1330	111		1.3		.66	496	7.1	32	4.2	57	7.7
Aug. 12.....	1800	81		4.3		3.7	725	7.2	32	.9	14	18
8-0253.6. SABINE RIVER AT TOLEDO BEND DAM NEAR BURKEVILLE, TEXAS (31°11'47", 93°34'24")												
Oct. 18, 1968...	1030			0.0		0.14	190	6.4	20	2.8	31	1.6
Dec. 5.....	0800			.3		.15	202	6.8	14	10.5	101	.8
Feb. 5, 1969....	0955			.8		.45	225	6.7	14	7.2	69	.7
April 10.....	0810			.3		.16	187	6.8	17	7.7	79	1.7
June 12.....	0845			.4		.13	168	6.3	20	2.4	26	2.7
Aug. 19.....	1315			.0		.00	158	6.4	25	3.9	46	2.1
8-0260. SABINE RIVER BELOW TOLEDO BEND RESERVOIR NEAR BURKEVILLE, TEXAS (31°03'50", 93°31'10")												
Oct. 18, 1968...	0930	3,630		0.1		0.13	185	6.7	22	7.0	79	1.0
Dec. 5.....	1030	3,800		.4		.17	180	6.8	14	10.3	98	1.0
Feb. 5, 1969....	1045	450		.5		.21	161	6.5	11	10.5	95	.8
April 10.....	0900	23,400		1.8		.09	176	6.8	16	9.8	97	.8
June 12.....	0930	5,200		.4		.10	170	6.2	22	3.8	43	1.8
Aug. 19.....	1400	1,980		.1		.20	159	6.4	28	4.8	61	1.8

Table 1.--Biochemical-oxygen-demand and selected nutrients records of Texas surface waters, 1969--continued

(Results in milligrams per liter except as indicated)

Date	Time (24 hour)	Discharge (cfs)	Ammonia (NH <sub>4</sub> )	Nitrate (NO <sub>3</sub> )	Nitrite (NO <sub>2</sub> )	Phosphate (PO <sub>4</sub> )	Specific conductance (micromhos at 25°C)	pH (field)	Tem- pera- ture (°C)	Dissolved oxygen (DQ)		Bio- chem- ical oxygen demand (BOD)
										mg/l	Per- cent sat- uration	
8-0305. SABINE RIVER NEAR RULIFF, TEXAS (30°18'13", 93°44'37")												
Oct. 16, 1968...	1300	4,580		0.1		0.07	166	6.9	25	7.4	88	0.7
Dec. 3.....	1200	13,300		.0		.24	81	6.2	13	8.3	78	2.8
Feb. 6, 1969....	1135	2,760		.7		.19	115	6.4	15	9.0	88	1.9
April 15.....	0905	35,100		.3		.10	146	6.5	18	7.8	81	1.2
June 5.....	1640	18,600		.4		.12	164	6.6	22	6.7	74	1.0
Aug. 21.....	1620	3,450		.2		.22	154	7.0	30	7.0	83	1.4
8-0325. NECHES RIVER NEAR ALTO, TEXAS (31°34'45", 95°09'55")												
Oct. 7, 1968....	1245	476		0.0		0.09	259	6.7	20	7.6	84	1.2
Dec. 3.....	1300	3,030		3.2		.35	192	6.8	12	8.9	81	1.5
Feb. 3, 1969....	1510	1,020		.5		.15	273	6.6	14	9.6	91	.9
April 8.....	1345	4,460		.1		.18	161	6.7	20	6.4	70	1.0
June 10.....	1400	1,180		1.2		.18	171	6.7	26	9.6	116	1.5
Aug. 18.....	1220	28		.0		.18	391	6.8	31	6.0	80	1.8
8-0335. NECHES RIVER NEAR ROCKLAND, TEXAS (31°01'45", 94°23'46")												
Oct. 15, 1968...	1300	532		0.1		0.13	247	6.8	25	7.1	85	0.5
Dec. 4.....	1230	3,200		.2		.21	132	6.7	12	8.2	75	3.4
Feb. 4, 1969....	1510	1,700		.2		.18	327	6.5	13	10.4	98	1.4
April 9.....	1245	6,840		.0		.21	178	6.6	21	6.4	71	1.3
June 11.....	1250	1,700		3.4		.36	179	6.5	26	5.9	72	1.4
Aug. 19.....	0935	49		.0		.30	395	6.7	30	5.4	70	2.6
8-0370. ANGELINA RIVER NEAR LUFKIN, TEXAS (31°27'26", 94°43'34")												
Oct. 14, 1968...	1800	450		0.1		0.14	143	6.7	24	7.2	84	0.9
Dec. 3.....	1530	2,540		.1		.32	162	6.7	12	8.4	78	1.6
Feb. 3, 1969....	1630	2,140		.2		.26	219	6.3	14	9.4	90	1.3
April 8.....	1530	3,560		.2		.29	154	6.6	21	6.4	71	1.6
June 10.....	1550	423		2.6		.44	168	6.5	26	9.0	110	1.8
Aug. 18.....	1415	52		.3		.25	312	7.0	31	6.1	82	1.1
8-0370.8. BAYOU LANANA NEAR SACOGDOCHES, TEXAS (31°31'10", 94°39'21")												
Oct. 14, 1968...	1700			0.6		1.6	267	7.0	24	2.9	34	3.4
Dec. 3.....	1430			.4		1.9	167	6.6	14	8.3	79	3.8
Feb. 3, 1969....	1700			4.5		.30	165	6.2	13	9.2	87	2.8
April 8.....	1615			1.4		.75	158	6.7	19	6.8	72	3.2
June 10.....	1515			1.0		.57	89	6.5	23	10.1	116	1.3
Aug. 18.....	1340			0.0		11	525	7.1	28	.3	4	12
8-0372. PAPER MILL CREEK NEAR HERTY, TEXAS (31°23'32", 94°39'46")												
Oct. 14, 1968...	1900			0.0		1.2	1,250	6.9	36	5.3	76	19
Dec. 4.....	0800			.2		1.2	1,500	7.0	26	5.3	64	25
Feb. 3, 1969....	1825			1.6		.70	1,460	7.1	31	3.6	48	22
April 9.....	0815			.0		1.2	1,580	7.5	32	4.2	57	34
June 10.....	1700			1.7		1.4	1,420	7.3	38	5.0	74	19
Aug. 18.....	1600			.5		.86	1,560	7.4	38	3.6	53	9.6
8-0372.5. ANGELINA RIVER BELOW PAPER MILL CREEK NEAR HERTY, TEXAS (31°26'22", 94°37'11")												
Feb. 4, 1969....	0945			0.1		0.30	485	6.7	10	7.3	65	4.6
June 10.....	1815			1.2		1.0	401	6.6	28	7.2	90	3.6
Aug. 18.....	1530			2.1		.28	743	6.9	30	3.0	39	4.3
8-0373.3. ANGELINA RIVER NEAR ETOILE, TEXAS (31°22'24", 94°28'27")												
Oct. 15, 1968...	0830			0.1		0.14	188	6.4	23	1.5	17	1.5
Dec. 4.....	0930			.0		.25	245	6.9	11	5.6	50	1.7
Feb. 4, 1969....	1150			.2		.19	264	6.4	13	5.0	47	.9
April 9.....	0915			.1		.20	164	6.4	20	3.2	35	1.1
June 11.....	0915			1.5		.56	144	6.2	24	1.0	12	2.6
Aug. 19.....	0645			.4		.42	259	6.4	29	2.5	32	1.5

Table 1.--Biochemical-oxygen-demand and selected nutrients records of Texas surface waters, 1969--continued

(Results in milligrams per liter except as indicated)

Date	Time (24 hour)	Discharge (cfs)	Ammonia (NH <sub>4</sub> )	Nitrate (NO <sub>3</sub> )	Nitrite (NO <sub>2</sub> )	Phosphate (PO <sub>4</sub> )	Specific conductance (micromhos at 25°C)	pH (field)	Tem- pera- ture (°C)	Dissolved oxygen (DO)		Bio- chem- ical oxygen demand (BOD)
										mg/l	Per- cent sat- ura- tion	
8-0394. ANGELINA RIVER BELOW SAM RAYBURN DAM NEAR JASPER, TEXAS (31°03'30", 94°06'20")												
Oct. 15, 1968...	1345	2,800		0.0		0.00	178	6.4	24	4.8	56	0.6
Dec. 4.....	1340	4,010		.6		.03	179	6.9	16	8.6	85	1.0
Feb. 4, 1969....	1625	3,860		1.2		.05	173	6.7	12	11.6	107	.4
April 9.....	1420	11,800		.6		.11	165	6.9	15	9.6	94	.3
June 11.....	1415	18,500		.3		.08	139	6.4	22	7.8	89	1.0
Aug. 19.....	1100	2,740		.0		.10	146	6.4	25	2.9	35	1.2
8-0410. NECHES RIVER AT EVADALE, TEXAS (30°21'22", 94°05'36")												
Oct. 16, 1968...	1435	4,140		0.0		0.08	181	7.2	26	7.6	92	1.2
Dec. 3.....	1510	5,150		2.5		.18	156	6.7	13	8.8	83	2.2
Feb. 6, 1969....	1335	5,870		.5		.09	218	6.7	18	9.8	103	2.1
April 14.....	1520	21,900		.6		.12	164	6.6	20	7.8	84	1.0
June 5.....	1245	21,300		1.9		.24	148	6.7	22	6.7	75	1.1
Aug. 21.....	1730	2,100		.1		.15	160	7.1	31	6.2	83	2.1
8-0480. WEST FORK TRINITY RIVER AT FORT WORTH, TEXAS (32°45'40", 97°19'55")												
Oct. 9, 1968....	1305	1,130		2.5		0.40	242	7.6	21	6.6	73	7.8
Dec. 11.....	1515	31		.6		.64	539	7.3	10	5.4	50	4.4
Feb. 6, 1969....	1545	25		4.4		.60	415	7.4	12	5.0	48	3.5
April 10.....	1145	800		.0		.22	390	8.0	20	5.9	67	1.5
May 15.....	1720	3,180		1.0		.20	363	8.3	24	8.7	106	1.4
June 4.....	1630	300		2.6		.22	397	7.5	22	6.1	69	3.2
June 26.....	1500	65		4.3		3.6	394	7.5	30	5.7	75	2.1
July 10.....	1045	16		.3		.48	422	7.6	30	6.6	87	3.7
July 24.....	0900	31		1.6		.46	429	7.4	31	.6	8	3.8
Aug. 14.....	1525	16		1.2		.36	504	7.5	40	5.4	82	4.2
Aug. 28.....	1520	34		4.7		.48	295	7.2	27	.3	4	3.6
Sept. 18.....	1430	22		.1		.48	436	7.6	26	7.3	89	5.7
8-0493. WEST FORK TRINITY RIVER AT GRAND PRAIRIE, TEXAS (32°45'46", 96°59'42")												
Oct. 9, 1968....	1210	674		19		2.4	541	7.3	21	4.7	52	28
Dec. 11.....	1430	144		44		15	2,290	7.2	14	3.1	31	15
Feb. 5, 1969....	0840	139		43		13	943	7.4	11	4.4	41	8.1
April 8.....	0845	884		1.1		1.6	495	6.2	19	6.3	70	11
May 15.....	1630	3,840		3.9		.98	408	7.4	24	6.9	84	4.2
June 1.....	1015	480		16		4.9	746	7.6	25	4.8	57	11
June 26.....	1205	360		7.6		4.6	585	7.5	29	2.7	35	7.7
July 7.....	1155	280		24		7.0	723	7.3	30	2.4	32	7.0
July 23.....	2045	180		29		10	839	7.5	32	4.0	54	14
Aug. 14.....	1630	125		54		22	1,080	7.4	34	4.6	64	17
Aug. 28.....	1440	228		31		4.5	736	7.4	29	3.0	38	14
Sept. 18.....	1215	140		50		57	1,150	7.8	27	2.7	33	22
8-0574.1. TRINITY RIVER BELOW DALLAS, TEXAS (32°42'27", 96°44'08")												
Oct. 9, 1968....	1045	460		38		19	903	7.1	24	0.1	1	25
Dec. 11.....	1330	440		35		17	904	7.2	14	3.1	31	23
Feb. 5, 1969....	0930	470		34		16	806	7.3	12	3.3	32	18
April 8.....	1015	5,530		5.2		2.0	400	7.6	17	9.1	97	3.7
May 15.....	1525	9,060		3.9		1.1	417	7.4	23	5.5	65	6.0
June 3.....	1615	5,590		4.5		1.6	443	7.6	22	5.1	58	13
June 26.....	1150	1,820		12		2.2	458	7.3	26	4.5	55	6.7
July 7.....	1235	1,700		11		3.9	481	7.3	28	5.3	67	8.7
July 23.....	1950	620		45		17	879	7.2	31	.4	5	22
Aug. 12.....	1235	424		36		13	868	6.7	31	.5	7	11
Aug. 28.....	1355	666		35		10	779	7.2	29	1.1	14	17
Sept. 17.....	1625	511		41		18	891	7.1	28	.3	4	29

Table 1.--Biochemical-oxygen-demand and selected nutrients records of Texas surface waters, 1969--continued

(Results in milligrams per liter except as indicated)

Date	Time (24 hour)	Discharge (cfs)	Ammonia (NH <sub>4</sub> )	Nitrate (NO <sub>3</sub> )	Nitrite (NO <sub>2</sub> )	Phosphate (PO <sub>4</sub> )	Specific conductance (micromhos at 25°C)	pH (field)	Temperature (°C)	Dissolved oxygen (DO)		Biochemical oxygen demand (BOD)
										mg/l	Percent saturation	
8-0620. EAST FORK TRINITY RIVER NEAR CRANDALL, TEXAS (32°38'18", 96°29'05")												
Oct. 9, 1968....	0930	16		41		19	563	7.0	22	0.2	2	20
Dec. 11.....	1210	19		40		21	689	7.3	12	5.6	54	11
Feb. 5, 1969....	1015	404		.0		1.9	407	7.9	10	9.7	89	5.9
April 8.....	1105	842		3.2		1.0	366	7.9	20	7.9	94	3.5
May 15.....	1440	1,200		2.8		1.0	284	7.2	23	6.9	82	2.7
June 3.....	1530	2,580		1.8		.32	321	7.9	22	7.4	84	2.9
June 26.....	1110	1,800		3.3		.50	319	7.7	28	6.6	82	1.8
July 7.....	1335	460		3.6		1.5	332	7.4	30	4.6	61	5.0
July 23.....	1905	21		39		30	809	7.7	31	7.2	96	20
Aug. 12.....	1320	24		45		36	711	7.7	32	8.7	118	19
Aug. 28.....	1210	32		61		40	709	7.4	28	7.3	94	30
Sept. 18.....	1045	27		60		46	688	7.3	25	3.1	37	29
8-0625. TRINITY RIVER NEAR ROSSER, TEXAS (32°25'35", 96°27'45")												
Oct. 8, 1968....	1850	450		31		19	848	7.2	22	2.9	33	11
Dec. 11.....	1115	526		31		7.8	796	7.4	12	5.2	50	10
Feb. 5, 1969....	1105	980		7.6		6.0	556	7.5	11	7.1	66	9.0
April 8.....	1240	6,460		6.0		1.7	430	7.7	19	6.9	77	3.8
May 15.....	1240	11,300		5.7		1.2	381	7.5	22	4.3	51	3.2
June 3.....	1445	9,110		3.9		.56	374	7.3	22	5.0	57	5.2
June 26.....	1040	4,450		7.7		2.1	477	7.3	28	3.1	39	6.2
July 7.....	1655	1,950		9.6		1.7	442	7.5	29	4.3	55	6.9
July 23.....	1820	442		31		16	756	7.5	31	3.6	48	12
Aug. 12.....	1130	418		21		18	772	7.6	31	3.4	45	19
Aug. 28.....	1145	748		34		16	798	7.2	28	1.4	18	12
Sept. 17.....	1510	454		40		16	806	7.5	27	4.8	59	22
8-0627. TRINITY RIVER AT TRINIDAD, TEXAS (32°08'05", 96°06'20")												
Oct. 8, 1968....	1630	397		56		19	863	7.5	23	4.4	51	15
Dec. 11.....	1000	560		58		11	771	7.8	10	5.6	51	9.6
Feb. 4, 1969....	1630	1,960		12		1.6	410	7.5	11	7.9	74	12
April 8.....	1645	6,970		6.0		1.3	410	7.6	18	7.1	77	3.1
May 15.....	0940	28,400		3.8		.80	378	7.4	24	4.8	58	3.1
June 3.....	1320	13,000		3.1		.52	378	7.5	24	5.7	67	3.1
June 25.....	1350	6,580		2.4		.80	362	7.7	27	4.9	60	2.0
July 8.....	0930	2,280		8.8		3.2	439	7.2	28	3.7	47	3.0
July 23.....	1700	626		17		11	719	7.6	32	6.5	88	16
Aug. 12.....	1550	520		21		12	647	7.5	33	3.4	47	10
Aug. 28.....	0940	824		30		19	874	7.4	28	1.3	16	24
Sept. 17.....	1345	500		47		17	773	7.3	27	2.4	30	28
8-0653.5. TRINITY RIVER NEAR CROCKETT, TEXAS (31°20'20", 95°39'25")												
Oct. 7, 1968....	1110	775		8.2		3.8	667	7.1	22	5.8	66	4.5
Dec. 3.....	1145	8,440		.4		1.4	488	7.3	12	6.6	60	7.5
Feb. 3, 1969....	1335	4,900		24		7.0	926	7.2	14	6.1	59	22
April 8.....	1245	16,900		6.2		.64	329	7.5	20	6.4	69	2.7
June 10.....	1300	14,000		.6		.44	389	7.4	26	9.0	110	1.8
Aug. 18.....	1130	515		20		13	858	7.6	32	7.8	105	5.5
8-0665. TRINITY RIVER AT ROMAYOR, TEXAS (30°25'30", 94°51'02")												
Oct. 16, 1968....	1615	1,330		8.5		4.4	525	7.6	26	9.0	110	3.0
Dec. 3.....	1700	3,450		6.0		.87	262	7.2	11	9.4	85	3.3
Feb. 6, 1969....	1530	2,820		9.6		4.0	606	6.7	18	9.3	97	2.6
April 14.....	1230	37,600		3.2		.64	323	7.2	20	8.6	95	1.3
June 5.....	1030	24,900		1.3		.43	367	7.0	24	7.5	89	1.9
Aug. 22.....	1405	1,420		.1		.29	430	7.2	32	6.3	85	3.4
8-0680. WEST FORK SAN JACINTO RIVER NEAR CONROE, TEXAS (30°14'41", 95°27'26")												
Oct. 16, 1968....	1740	135		0.1		0.43	246	6.9	26	7.1	87	1.2
Dec. 3.....	1830	3,460		.0		.73	161	7.0	10	9.3	82	2.4
Feb. 6, 1969....	1650	400		.6		.29	594	6.7	16	9.2	92	2.6
April 14.....	1030	5,340		.7		.44	175	6.4	20	6.7	72	2.7
June 5.....	0815	60		.8		.26	358	6.8	20	7.8	86	1.7
Aug. 22.....	1520	10		.1		.39	257	7.5	36	4.2	60	2.2

Table 1.--Biochemical-oxygen-demand and selected nutrients records of Texas surface waters, 1969--continued

(Results in milligrams per liter except as indicated)

Date	Time (24 hour)	Discharge (cfs)	Ammonia (NH <sub>4</sub> )	Nitrate (NO <sub>3</sub> )	Nitrite (NO <sub>2</sub> )	Phosphate (PO <sub>4</sub> )	Specific conductance (micromhos at 25°C)	pH (field)	Tem- pera- ture (°C)	Dissolved oxygen (DO)		Bio- chem- ical oxygen demand (BOD)
										mg/l	Per- cent sat- ura- tion	
8-0740. BUFFALO BAYOU AT HOUSTON, TEXAS (29°45'36", 95°24'30")												
Oct. 21, 1968...	1345	79	0.00	0.0	0.07	4.7	514	7.1	24	5.9	69	6.0
Feb. 14, 1969...	1120	1700	1.2	1.8	.15	4.6	285	7.2	13	9.2	87	12
April 25.....	1245	39	1.7	.2	--	15	897	--	22	3.8	43	9.3
May 21.....	1100	705	--	.5	--	1.2	200	6.8	25	5.7	68	3.6
June 26.....	1235	39	3.8	5.0	1.5	11	822	7.2	30	4.2	55	5.4
8-0745. WHITEOAK BAYOU AT HOUSTON, TEXAS (29°46'30", 95°23'49")												
Oct. 21, 1968...	1330	6.7	10	2.0	0.30	3.0	1,220	6.7	24	5.9	69	12
Feb. 14, 1969...	1045	1,750	.00	2.0	.05	4.6	363	7.5	12	9.9	93	14
April 25.....	1305	9.1	23	1.7	1.2	18	1,330	--	26	12.4	151	7.2
May 21.....	1150	23	5.4	1.9	.90	12	763	6.8	30	8.4	109	7.5
June 26.....	1300	9.5	7.3	1.6	1.1	8.1	1,160	8.2	32	10.3	139	12
July 15.....	2235	600	4.4	.6	1.1	.93	281	6.5	26	4.2	51	20
8-0747.8. KEEGAN'S BAYOU AT KEEGAN ROAD NEAR HOUSTON, TEXAS (29°39'55", 95°30'20")												
Feb. 14, 1969...	1210	48	0.06	5.5	0.06	1.5	146	6.7	13	7.6	72	5.4
8-0748. KEEGAN'S BAYOU AT ROARK ROAD NEAR HOUSTON, TEXAS (29°39'23", 95°33'43")												
Oct. 21, 1968...	1425	0.90	0.00	0.5	0.00	0.14	653	8.0	19	8.4	89	2.6
Feb. 14, 1969...	1140	66	.00	1.8	.06	.90	203	6.7	14	8.2	78	4.9
April 11.....	1345	2.6	7.7	.0	--	.50	623	--	21	8.1	90	2.5
April 25.....	1120	2.6	--	.6	--	.60	859	--	--	10.4	--	5.7
May 23.....	1435	.56	--	.1	--	.50	565	6.9	33	9.4	129	3.3
June 26.....	1135	.62	--	.4	.06	.90	700	8.1	29	6.9	88	2.6
8-0749. WILLOW WATERHOLE BAYOU AT LANDSDOWNE STREET, HOUSTON, TEXAS (29°39'01", 95°29'11")												
Feb. 14, 1969...	0920	140	0.61	3.7	0.34	8.3	223	6.8	12	7.6	71	9.3
April 11.....	1630	3.0	4.5	.2	.03	11	608	7.2	22	3.5	40	12
8-0750. BRAYS BAYOU AT HOUSTON, TEXAS (29°41'49", 95°24'43")												
Oct. 21, 1968...	1510	31	3.1	27	1.1	14	831	8.3	28	13.0	161	8.0
Feb. 14, 1969...	1030	2,670	.76	4.5	.12	.62	249	6.7	13	8.0	75	7.8
Mar. 15.....	1620	2,670	--	3.5	--	--	235	6.8	10	9.3	82	10
April 11.....	1030	38	1.6	.4	.50	22	828	--	24	5.8	67	17
April 11.....	1215	200	1.2	2.0	--	6.4	480	--	22	6.4	73	31
April 11.....	1430	450	1.3	.0	1.5	1.9	354	--	21	6.4	71	22
April 25.....	1020	38	8.9	1.5	1.8	13	896	--	24	10.4	122	7.2
May 5.....	1145	502	--	--	--	4.2	263	6.9	22	8.0	90	2.4
May 5.....	1240	1,800	--	--	--	2.4	138	6.8	22	7.8	89	3.6
May 5.....	1500	1,400	--	--	--	3.8	196	6.9	22	6.6	75	12
May 23.....	1345	62	4.9	2.2	1.7	2.4	782	6.9	29	5.8	74	13
June 2.....	0825	141	2.0	2.6	.82	7.0	444	7.2	25	5.2	61	8.7
June 2.....	1610	73	3.8	7.9	1.8	7.0	637	7.7	29	9.4	95	9.0
June 3.....	0815	30	4.7	2.2	1.3	21	751	7.2	24	6.8	80	6.0
June 3.....	1000	37	7.1	9.6	1.6	30	801	7.3	25	8.9	106	9.6
June 3.....	1230	43	4.9	18	2.0	13	776	7.4	27	11.2	138	19
June 3.....	1400	43	4.7	19	2.0	8.4	776	7.8	26	11.1	135	20
June 3.....	1600	42	5.3	19	3.2	7.4	788	7.3	26	10.1	123	12
June 3.....	1800	41	8.2	5.4	2.2	15	803	7.4	26	8.8	107	18
June 3.....	2000	189	1.7	3.0	--	5.1	310	6.4	24	10.1	119	12
June 4.....	0730	63	.7	2.5	--	7.4	559	5.7	23	8.1	93	6.9
June 26.....	1420	40	8.3	8.0	4.1	6.2	857	7.9	31	7.5	140	9.6



Table 1.--Biochemical-oxygen-demand and selected nutrients records of Texas surface waters, 1969--continued

(Results in milligrams per liter except as indicated)

Date	Time (24 hour)	Discharge (cfs)	Ammonia (NH <sub>4</sub> )	Nitrate (NO <sub>3</sub> )	Nitrite (NO <sub>2</sub> )	Phosphate (PO <sub>4</sub> )	Specific conductance (micromhos at 25°C)	pH (field)	Temperature (°C)	Dissolved oxygen (DO)		Biochemical oxygen demand (BOD)
										mg/l	Percent saturation	
8-0755. SIMS BAYOU AT HOUSTON, TEXAS (29°40'27", 95°17'21")												
Oct. 21, 1968...	1550	17	48	0.4	0.80	1.4	1,970	7.4	24	5.2	61	9.2
Feb. 14, 1969...	1215	1,460	1.2	2.2	.12	7.0	566	7.2	13	8.8	83	19
April 28.....	1440	30	--	.3	.88	8.0	1,790	7.6	24	4.4	52	9.3
May 23.....	1310	26	6.3	.2	.53	14	1,440	6.8	29	2.0	26	6.3
June 26.....	2005	19	9.7	.3	.45	19	1,940	7.9	32	2.5	34	14
8-0756.5. BERRY BAYOU AT FOREST OAKS STREET, HOUSTON, TEXAS (29°40'35", 95°14'37")												
Feb. 14, 1969...	1345	290	0.41	2.6	0.08	1.6	349	6.8	14	7.1	68	8.7
May 23.....	1140	6.6	9.2	.2	--	25	3,140	6.8	27	1.4	17	20
8-0757.5. HUNTING BAYOU TRIBUTARY AT CAVALCADE STREET, HOUSTON, TEXAS (29°48'00", 95°20'02")												
Oct. 21, 1968...	1245						2.030	7.3	27	2.0	25	43
8-0757.7. HUNTING BAYOU AT U. S. HIGHWAY 90-A, HOUSTON, TEXAS (29°47'43", 95°16'21")												
Oct. 21, 1968...	1215	3.0	2.6	0.0	0.05	5.8	1,260	8.1	21	13.0	141	5.9
Feb. 14, 1969...	1005	397	2.9	3.0	.14	1.8	369	6.7	12	7.2	57	22
April 25.....	1500	5.9	2.2	4.6	.34	2.4	1,390	--	24	4.2	49	3.6
May 23.....	1030	6.0	3.6	.1	--	3.4	1,300	6.8	26	3.5	42	4.3
June 26.....	2100	2.5	2.4	2.3	.26	.90	1,150	7.2	31	8.8	117	5.7
Aug. 18.....	2250	267	--	11	.50	5.0	317	--	26	2.8	34	11
8-0760. GREENS BAYOU AT HOUSTON, TEXAS (29°55'05", 95°18'24")												
Oct. 21, 1968...	1055	1.1	0.00	3.6	0.30	5.9	1,050	8.5	18	9.4	99	5.2
Feb. 14, 1969...	0850	200	.00	2.7	.08	2.4	400	7.6	12	9.8	89	9.6
April 25.....	1415	8.1	--	.2	--	3.6	1,000	--	24	12.6	148	3.7
May 23.....	0910	11	--	2.7	.46	2.4	730	6.8	27	5.8	72	2.7
June 26.....	1635	3.2	--	1.7	.70	5.3	985	7.6	31	4.3	57	4.6
Aug. 18.....	2215	146	--	2.1	.74	5.8	246	--	26	5.4	66	7.2
8-0765. HALLS BAYOU AT HOUSTON, TEXAS (29°51'42", 95°20'05")												
Oct. 21, 1968...	1130	4.0	14	1.5	0.02	28	3,530	8.0	20	5.0	56	25
Feb. 14, 1969...	0930	412	.00	4.2	.08	4.8	309	7.6	12	8.2	76	10
April 25.....	1345	8.4	8.3	.3	--	26	2,770	--	24	15.0	174	15
May 23.....	0945	6.5	7.4	.3	.22	21	1,910	6.9	26	1.4	17	7.5
June 26.....	1800	3.3	16	.5	.14	38	3,560	7.9	32	4.1	55	28
July 15.....	2330	53	2.3	.3	.11	8.8	417	6.4	26	7.7	94	20
8-0840. CLEAR FORK BRAZOS AT NUGENT, TEXAS (32°41'25", 99°40'10")												
Feb. 18, 1969...	1210	8.3		7.6		0.07	4,640	--	6	--	--	2.3
Mar. 3.....	1525	6.2		9.8		.10	4,580	7.7	9	9.8	84	1.5
July 22.....	1600	.64		.2		.38	3,140	8.2	28	17.8	228	11
Sept. 22.....	1700	1,730		1.0		.14	554	7.1	26	6.0	73	1.7
8-0841. DEADMAN CREEK NEAR NUGENT, TEXAS (32°40'36", 99°37'00")												
Feb. 18, 1969...	1240	14		34		29	1,950	--	7	--	--	19
Mar. 3.....	1445	--		32		37	1,700	8.2	10	10.8	96	6.7
July 22.....	1700	--		11		15	2,250	8.3	31	7.0	93	5.1
Sept. 22.....	1815	24		19		10	1,490	7.5	26	6.2	76	4.5
8-0920. NOLAN RIVER AT BLUM, TEXAS (32°09'02", 97°24'10")												
Oct. 9, 1968....	1500	5.0		0.0		15	723	8.0	22	8.7	99	4.4
Dec. 9.....	1130	3.7		5.0		5.2	507	7.5	6	11.4	94	.5
Feb. 5, 1969....	1830	4.2		4.6		23	764	8.3	12	13.5	130	5.9
Feb. 18.....	1300	3.7		29		21	712	8.0	10	15.0	138	8.4
April 10.....	1520	12		4.0		2.9	523	8.8	28	12.5	161	3.0
June 4.....	1010	68		7.5		.70	587	7.9	20	9.0	98	2.4
July 9.....	1830	5.0		1.9		1.6	623	8.6	36	12	171	2.8
Aug. 11.....	1210	1.6		.2		2.2	632	8.7	33	16	219	1.4

Table 1.--Biochemical-oxygen-demand and selected nutrients records of Texas surface waters, 1969--continued

(Results in milligrams per liter except as indicated)

Date	Time (24 hour)	Discharge (cfs)	Ammonia (NH <sub>4</sub> )	Nitrate (NO <sub>3</sub> )	Nitrite (NO <sub>2</sub> )	Phosphate (PO <sub>4</sub> )	Specific conductance (micromhos at 25°C)	pH (field)	Tem- pera- ture (°C)	Dissolved oxygen (DO)		Bio- chem- ical oxygen demand (BOD)
										mg/l	Per- cent sat- ura- tion	
8-0935. AQUILLA CREEK NEAR AQUILLA, TEXAS (31°50'40", 97°12'06")												
Oct. 9, 1968....	1600	1,900		0.8		0.29	119	7.5	20	7.6	84	6.0
Dec. 9.....	1040	9.7		6.1		.78	798	7.7	6	11.0	91	1.9
Feb. 5, 1969....	1750	5.9		.0		.84	1,090	7.7	11	12.2	114	21
Feb. 18.....	1145	22		11		1.5	876	7.8	8	11.2	97	4.1
April 10.....	1610	68		6.1		1.0	810	7.9	24	6.4	78	1.2
June 3.....	1750	17		3.9		.18	1,080	7.7	22	7.7	87	2.0
July 9.....	1540	1.1		1.9		.18	1,380	7.4	32	9.7	131	2.6
Aug. 11.....	1320	.4		.4		.08	1,240	7.6	32	12	162	1.5
8-0965. BRAZOS RIVER AT WACO, TEXAS (31°33'40", 97°07'42")												
Oct. 9, 1968....	1800	2,050		0.0		0.09	1,070	7.5	24	8.2	95	1.6
Dec. 9.....	0920	698		1.0		.06	527	7.7	10	9.3	85	.4
Feb. 5, 1969....	1655	178		.0		.12	1,170	8.0	12	13.5	130	1.0
Feb. 18.....	1030	635		3.0		.12	548	8.0	8	10.6	92	1.3
April 10.....	1710	226		.6		.57	946	8.1	27	8.6	109	1.9
June 4.....	0830	4,650		.5		.06	1,140	7.7	21	7.1	79	1.7
July 9.....	1700	1,800		.1		.18	1,410	7.6	31	7.5	100	1.2
Aug. 11.....	1415	2,150		.3		.08	1,530	7.9	33	7.6	104	1.0
8-0982.9. BRAZOS RIVER AT HIGHBANK, TEXAS (31°08'02", 96°49'20")												
Oct. 10, 1968...	0930	784		0.0		0.62	1,180	7.8	21	9.6	107	2.7
Dec. 3.....	0945	3,060		.5		.56	376	7.0	11	9.4	85	3.7
Feb. 3, 1969....	1200	264		1.8		.76	1,180	8.4	12	12.2	114	2.4
April 8.....	1100	836		6.3		.54	539	7.9	20	8.0	88	2.0
June 10.....	1115	4,220		.4		.16	1,370	7.9	26	9.0	110	1.7
Aug. 18.....	1000	338		.2		.42	1,500	7.6	29	7.4	95	4.0
8-1030. SOUTH FORK ROCKY CREEK NEAR BRIGGS, TEXAS (30°54'40", 98°02'10") (HYDROLOGIC BENCH MARK STATION)												
Feb. 19, 1969...	1000	0.22		0.8		0.04	461	7.9	8	10.2	85	0.3
Mar. 27.....	0940	1.7		.1		.00	480	8.3	14	9.6	91	.2
April 30.....	0930	19		.7		.05	497	7.9	19	9.0	96	.3
May 28.....	1050	10		1.2		.02	493	8.1	24	8.0	94	.7
June 30.....	1000	.49		1.7		.02	499	7.8	26	6.8	83	.1
8-1065. LITTLE RIVER AT CAMERON, TEXAS (30°49'53", 96°57'01")												
Oct. 10, 1968...	1030	212		7.2		0.39	642	7.6	23	8.1	93	2.7
Dec. 3.....	0830	2,850		8.6		.53	306	7.0	10	10.1	89	3.1
Feb. 3, 1969....	1010	261		10		.94	715	7.8	14	10.2	97	1.2
April 8.....	1000	1,640		5.2		.41	531	8.0	20	8.4	91	1.3
June 10.....	1015	813		6.1		.22	627	7.7	26	8.4	102	1.1
Aug. 18.....	0900	222		4.0		.70	466	7.3	29	5.7	73	5.8
8-1140. BRAZOS RIVER AT RICHMOND, TEXAS (29°34'56", 95°45'27")												
Oct. 9, 1968....	1445	5,200		0.0		0.26	369	7.1	25	6.4	76	2.2
Dec. 5.....	1635	16,900		7.4		.36	305	7.8	12	8.6	80	3.4
Feb. 6, 1969....	1555	1,520		.1		.28	872	8.0	16	9.7	96	4.8
April 17.....	1625	44,400		1.4		.32	235	7.4	21	6.8	76	3.9
June 6.....	1415	12,200		2.2		.07	852	8.1	24	7.0	83	2.9
Aug. 22.....	1435	1,550		--		--	--	--	32	8.1	109	5.2
8-1166.5. BRAZOS RIVER NEAR ROSHARON, TEXAS (29°20'58", 95°34'56")												
Oct. 9, 1968....	1300	5,600		0.0		0.21	542	7.4	26	6.4	78	2.4
Dec. 5.....	1525	21,300		4.8		.45	342	7.6	13	8.8	83	3.2
Feb. 6, 1969....	1440	1,690		.0		.28	758	7.8	15	9.8	96	5.3
April 17.....	1135	52,600		1.8		.31	247	7.7	20	6.8	86	2.7
June 6.....	1200	11,500		2.2		.01	867	8.4	24	8.0	94	1.1
Aug. 20.....	1600	970		--		.37	--	7.6	31	9.0	120	4.6
Sept. 18.....	1300	999		--		.63	--	7.7	29	7.8	100	2.4

Table 1.--Biochemical-oxygen-demand and selected nutrients records of Texas surface waters, 1969--continued

(Results in milligrams per liter except as indicated)

Date	Time (24 hour)	Discharge (cfs)	Ammonia (NH <sub>4</sub> )	Nitrate (NO <sub>3</sub> )	Nitrite (NO <sub>2</sub> )	Phosphate (PO <sub>4</sub> )	Specific conductance (micromhos at 25°C)	pH (field)	Tem- pera- ture (°C)	Dissolved oxygen (DO)		Bio- chem- ical oxygen demand (BOD)
										mg/l	Per- cent sat- ura- tion	
8-1361.5. CONCHO RIVER NEAR VERIBEST, TEXAS (31°32'07", 100°13'05")												
Feb. 19, 1969...	1005			41		0.10	2,600	--	9	--	--	4.4
July 1.....	1120			1.4		.27	2,320	7.6	29	6.2	79	5.4
Sept. 22.....	1400			7.6		1.1	1,150	8.3	26	8.8	107	6.7
8-1365. CONCHO RIVER NEAR PAINT ROCK, TEXAS (31°31'05", 99°55'10")												
Oct. 23, 1968...	1030	6.8		2.4		0.08	2,250	--	--	--	--	2.4
Feb. 18, 1969...	1230	6.8		14		.07	2,670	--	10	--	--	3.4
July 1.....	1020	8.4		4.3		.19	2,050	7.8	30	6.3	82	3.9
Sept. 22.....	1230	38		5.7		.54	983	8.5	28	7.3	92	3.9
8-1470. COLORADO RIVER NEAR SAN SABA, TEXAS (31°13'05", 98°33'50")												
Oct. 25, 1968...	1015	86		1.4		0.53	686	7.9	17	7.9	81	0.7
Dec. 19.....	1010	180		.4		.17	1,070	8.1	10	9.5	85	1.6
Feb. 19, 1969...	1200	165		1.0		.10	1,290	8.0	10	10.8	95	2.1
April 30.....	1115	277		3.4		.20	878	8.1	22	8.5	96	2.8
June 30.....	1200	437		2.6		.10	617	7.7	30	7.1	93	.7
Aug. 29.....	1000	514		1.8		.62	752	8.0	26	6.5	79	1.8
8-1535. PEDERNALES RIVER NEAR JOHNSON CITY, TEXAS (30°17'27", 98°24'01")												
Feb. 19, 1969...	1400	60		1.7		0.04	722	8.4	10	10.9	96	0.8
April 30.....	1335	113		1.0		.05	603	8.2	20	8.8	96	1.1
June 30.....	1400	45		.8		.06	477	8.2	32	8.5	115	.9
8-1586.5. COLORADO RIVER AT FARM ROAD 973 BELOW AUSTIN, TEXAS (30°12'28", 97°38'15")												
Oct. 10, 1968...	1300	110		1.0		4.8	564	7.3	26	6.3	76	4.4
Dec. 4.....	0730	96		10		4.6	592	7.4	12	7.3	68	7.2
Feb. 4, 1969...	0830	58		19		6.5	653	7.2	13	5.4	51	9.0
April 9.....	0815	940		6.5		1.2	528	7.6	24	6.5	76	4.7
June 11.....	0815	2,000		.2		.76	501	7.5	24	7.8	91	2.2
Aug. 5.....	1130	1,920		3.8		1.5	510	7.5	30	7.6	99	2.4
8-1592. COLORADO RIVER AT BASTROP, TEXAS (30°06'20", 97°19'08")												
Oct. 10, 1968...	1200	463		0.0		0.95	536	7.6	25	7.5	89	1.4
Dec. 4.....	0830	408		.1		.65	424	7.7	10	10.1	89	2.1
Feb. 4, 1969...	0915	164		9.2		4.0	675	7.8	12	11.0	102	5.4
April 9.....	0915	740		5.3		1.4	543	7.9	24	8.1	94	3.4
June 11.....	0900	1,780		.1		.53	509	7.7	26	7.3	88	1.7
Aug. 5.....	1230	1,140		2.3		.57	517	8.0	30	8.0	105	2.1
8-1610. COLORADO RIVER AT COLUMBUS, TEXAS (29°42'20", 96°32'05")												
Oct. 9, 1968...	1530	1,010		0.0		0.56	512	7.9	26	9.5	116	4.1
Dec. 4.....	1100	3,460		3.2		.71	265	7.4	11	9.1	82	3.7
Feb. 6, 1969...	1145	331		.0		.95	702	7.8	14	9.6	93	6.7
April 22.....	1015	4,310		2.0		.35	486	7.9	22	8.4	95	1.1
June 3.....	1235	2,660		.0		.38	506	8.7	26	--	--	2.5
Aug. 21.....	1040	1,910		.0		.79	480	8.0	30	7.6	100	3.1
8-1620. COLORADO RIVER AT WHARTON, TEXAS (29°18'30", 96°06'15")												
Oct. 9, 1968...	1130	785		0.0		0.27	526	7.9	26	7.4	90	2.3
Dec. 4.....	1530	8,120		3.1		.76	236	7.3	12	9.6	87	3.4
Feb. 6, 1969...	1325	467		.2		.33	656	7.8	18	7.4	77	5.7
April 23.....	0745	3,870		2.3		.37	489	7.9	22	8.0	91	1.8
June 4.....	0950	2,050		.2		.47	485	8.4	24	--	--	3.5
Aug. 21.....	1745	900		.1		.48	466	--	32	8.0	108	3.2

Table 1.--Biochemical-oxygen-demand and selected nutrients records of Texas surface waters, 1969--continued

(Results in milligrams per liter except as indicated)

Date	Time (24 hour)	Discharge (cfs)	Ammonia (NH <sub>4</sub> )	Nitrate (NO <sub>3</sub> )	Nitrite (NO <sub>2</sub> )	Phosphate (PO <sub>4</sub> )	Specific conductance (micromhos at 25°C)	pH (field)	Temperature (°C)	Dissolved oxygen (DO)		Biochemical oxygen demand (BOD)
										mg/l	Percent saturation	
8-1645. NAVIDAD RIVER NEAR GANADO, TEXAS (29°01'32", 96°33'08")												
Oct. 9, 1968....	1030	113		0.0		0.46	609	7.7	26	6.8	82	1.7
Dec. 4.....	1200	970		.1		.38	165	7.6	12	10.6	96	2.5
Feb. 4, 1969....	1145	65		.4		.24	614	8.0	12	10.4	97	1.6
April 9.....	1115	96		.8		.23	744	8.3	23	8.6	99	1.2
June 11.....	1130	115		.3		.30	679	8.0	26	8.0	98	2.0
Aug. 5.....	1515	97		.4		.52	769	7.8	30	8.1	107	2.8
8-1695.8. GUADALUPE RIVER AT LAKE DUNLAP BELOW NEW BRAUNFELS, TEXAS (29°40'00", 98°94'14")												
Oct. 8, 1968....	0945			0.9		0.20	512	7.5	26	6.1	73	0.8
Dec. 5.....	1830			4.2		.09	502	7.8	20	10.0	110	.8
Feb. 5, 1969....	1530			5.1		.28	498	7.9	17	9.3	96	.7
April 10.....	1730			5.1		.32	501	7.7	24	7.3	86	1.0
June 12.....	1645			1.4		.24	477	8.0	27	11.0	136	1.9
Aug. 7.....	1705			.9		.22	427	8.1	32	18.8	254	4.4
8-1755.2. GUADALUPE RIVER BELOW VICTORIA, TEXAS (28°45'10", 97°00'30")												
Oct. 9, 1968....	0910	903		0.7		0.38	614	7.8	27	7.4	91	0.6
Dec. 4.....	1315	8,780		.2		.45	257	7.7	11	10.4	94	2.5
Feb. 4, 1969....	1430	933		5.9		.57	705	7.9	18	9.2	98	1.2
April 9.....	1400	1,220		3.8		.28	701	8.0	26	9.0	108	2.2
June 11.....	1300	1,730		1.5		.42	560	8.0	28	7.7	99	1.0
Aug. 5.....	1700	681		1.9		.07	545	8.1	31	8.0	107	2.0
8-1777. OLMOS CREEK AT DRESDEN DRIVE AT SAN ANTONIO, TEXAS (29°29'56", 98°30'36")												
Nov. 27, 1968....	1036	4.4		1.7	--	0.80	260		13	--	--	9.3
Feb. 13, 1969....	1430	32		3.8	0.11	.17	261		12	9.7	90	6.6
Mar. 15.....	1210	68		3.5	.13	.80	175		12	10.2	93	5.0
May 3.....	0915	194		5.1	.24	3.0	151		18	7.6	80	6.6
May 16.....	1350	106		3.8	.09	1.0	176		21	--	--	7.4
June 24.....	1045	63		2.2	--	.74	248		25	--	--	13
8-1778. OLMOS RESERVOIR AT SAN ANTONIO, TEXAS (29°28'30", 98°28'23")												
Mar. 15, 1969....	1700			6.2	0.19	1.4	207		12	8.6	80	6.7
8-1780. SAN ANTONIO RIVER AT SAN ANTONIO, TEXAS (29°24'33", 98°29'38")												
Nov. 27, 1968....	1315	217		1.3	--	0.71	217		15	--	--	8.7
Feb. 13, 1969....	1600	245		5.2	0.08	.80	231		14	10.0	96	9.9
Mar. 15.....	1430	347		4.6	.09	1.3	377		14	9.6	91	8.1
May 3.....	1610	550		4.1	.26	1.7	214		20	8.0	87	6.9
June 24.....	1345	60		5.1	--	.68	342		28	--	--	9.9
8-1783. ALAZAN CREEK AT ST. CLOUD STREET, SAN ANTONIO, TEXAS (29°27'29", 98°32'59")												
Nov. 27, 1968....	0905	5.0		0.5	--	0.68	206		12	--	--	6.5
Feb. 13, 1969....	1525	17		2.2	0.04	.29	182		13	9.7	92	5.0
Mar. 15.....	1310	6.6		5.6	.14	1.1	278		14	10.0	95	4.3
May 3.....	1030	9.6		11	.17	1.6	311		19	8.3	88	5.4
May 16.....	1150	118		3.8	.00	.98	176		19	--	--	4.1
May 16.....	1245	40		2.8	.11	.51	240		19	--	--	3.9
8-1786. PANTHER SPRINGS CREEK AT FARM ROAD 2696. SAN ANTONIO, TEXAS (29°37'31", 98°31'06")												
May 16, 1969....	1205	4,190		2.1	0.04	0.50	102		18	--	--	4.6
May 16.....	1330	847		1.8	.02	.29	100		18	9.1	97	2.6
May 16.....	1615	77		3.5	.03	.25	115		20	8.9	97	2.6

Table 1.--Biochemical-oxygen-demand and selected nutrients records of Texas surface waters, 1969--continued

(Results in milligrams per liter except as indicated)

Date	Time (24 hour)	Discharge (cfs)	Ammonia (NH <sub>4</sub> )	Nitrate (NO <sub>3</sub> )	Nitrite (NO <sub>2</sub> )	Phosphate (PO <sub>4</sub> )	Specific conductance (micromhos at 25°C)	pH (field)	Tem- pera- ture (°C)	Dissolved oxygen (DO)		Bio- chem- ical oxygen demand (BOD)
										mg/l	Per- cent sat- ura- tion	
8-1786.9. SALADO CREEK TRIBUTARY AT BITTERS ROAD, SAN ANTONIO, TEXAS (29°31'36", 98°26'25")												
Nov. 27, 1968...	1259	2.7		0.3	--	0.64	83		12	--	--	7.8
Feb. 13, 1969...	1300	6.5		1.9	0.04	.73	75		13	10.0	94	1.9
Mar. 15.....	1105	1.8		6.5	.15	3.0	121		12	10.2	94	4.6
May 16.....	1030	10		4.2	.00	.51	73		20	8.6	93	3.5
June 24.....	0835	2.5		3.6	--	1.9	118		25	--	--	7.5
8-1787. SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TEXAS (29°30'57", 98°25'51")												
Nov. 27, 1968...	1219	5.8		0.2	--	0.78	1,030		13	--	--	7.6
Feb. 13, 1969...	1335	2.7		2.4	0.05	.67	827		14	10.3	98	5.0
Mar. 15.....	1130	7.5		5.5	.14	1.3	1,500		12	11.8	110	2.5
May 3.....	1220	55		7.2	.21	2.2	1,210		20	8.2	89	3.7
May 12.....	1900	12		4.9	.20	1.2	830		23	--	--	5.2
May 16.....	1440	90		4.9	.10	3.6	672		22	7.6	85	4.8
May 16.....	2120	1,240		3.2	.09	.46	242		20	7.3	79	7.0
May 17.....	0935	95		2.5	.06	.64	203		20	7.0	76	2.9
June 24.....	0910	11		6.9	--	1.5	1,510		28	--	--	5.6
8-1788. SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TEXAS (29°21'25", 98°24'45")												
Nov. 27, 1968...	1512	99		8.5	--	0.87	536		15	--	--	5.4
Feb. 13, 1969...	1704	45		4.6	0.06	.61	532		14	8.8	85	5.6
Mar. 15.....	1605	400		7.4	.12	.88	412		14	8.4	81	4.8
May 3.....	1515	485		6.8	.14	1.1	418		21	6.1	68	5.7
May 17.....	1226	464		5.8	.20	1.2	412		22	5.4	61	5.9
June 24.....	1500	117		4.5	--	.63	595		28	--	--	6.0
8-1805. MEDINA RIVER NEAR RIOMEDINA, TEXAS (29°29'53", 98°54'16")												
Oct. 8, 1968...	1120	18		1.0		0.06	465	7.4	24	6.9	82	0.4
Dec. 5.....	1345	21		1.3		.04	476	8.0	16	11.1	113	.3
Feb. 5, 1969...	1410	13		1.2		.08	467	7.8	14	9.0	87	.3
April 10.....	1540	14		1.0		.03	443	7.6	22	8.8	100	1.5
May 15.....	1600	27		.5		.06	441	7.6	24	8.2	96	.7
June 3.....	2015	23		1.0		.05	451	7.3	23	7.0	80	.7
June 12.....	1530	21		1.3		.31	454	7.6	26	8.4	102	.5
July 12.....	1020	24		.8		.05	468	7.0	25	7.2	86	.7
July 23.....	1440	23		.7		.04	459	7.3	26	8.2	100	.3
Aug. 7.....	1530	22		.6		.04	467	7.5	26	7.6	92	.4
Aug. 20.....	1630	22		.8		.05	467	7.2	24	7.1	83	.4
Sept. 25.....	1015	19		.8		.08	464	7.3	22	6.4	73	.4
8-1814. HELOTES CREEK AT HELOTES, TEXAS (29°34'44", 98°41'29")												
May 12, 1969...	1750	3.2		0.2	0.05	0.06	444		24			1.0
May 16.....	1530	98		2.0	.04	.09	324		22			.8
May 17.....	1420	42		1.8	--	.24	442		24	8.3	97	2.5
8-1818. SAN ANTONIO RIVER NEAR ELMENDORF, TEXAS (29°14'15", 98°21'43")												
Oct. 8, 1968...	1300	191		28		9.4	823	7.5	26	3.5	43	14
Dec. 5.....	1230	244		5.2		5.7	868	7.9	15	9.0	88	8.4
Feb. 3, 1969...	1230	108		.6		2.1	931	7.7	16	6.4	64	13
April 10.....	1410	85		23		15	958	7.6	24	4.7	56	5.3
May 13.....	1430	1,010		5.8		8.2	703	7.5	25	5.6	67	21
June 3.....	1200	161		24		3.7	842	7.2	26	5.3	65	12
June 12.....	1320	136		7.6		8.9	928	7.7	28	5.1	65	3.9
July 12.....	1230	96		27		10	946	7.5	30	5.4	71	7.2
July 23.....	1310	110		25		16	899	7.5	30	5.5	72	3.8
Aug. 7.....	1310	74		30		20	926	7.6	30	5.2	68	3.5
Aug. 20.....	1500	70		26		16	869	7.5	30	5.0	65	5.4
Sept. 25.....	1200	153		18		2.1	714	7.5	26	6.0	73	5.1

Table 1.--Biochemical-oxygen-demand and selected nutrients records of Texas surface waters, 1969--continued

(Results in milligrams per liter except as indicated)

Date	Time (24 hour)	Discharge (cfs)	Ammonia (NH <sub>4</sub> )	Nitrate (NO <sub>3</sub> )	Nitrite (NO <sub>2</sub> )	Phosphate (PO <sub>4</sub> )	Specific conductance (micromhos at 25°C)	pH (field)	Tem- pera- ture (°C)	Dissolved oxygen (DO)		Bio- chem- ical oxygen demand (BOD)
										mg/l	Per- cent sat- ura- tion	
8-1835. SAN ANTONIO RIVER NEAR FALLS CITY, TEXAS (28°57'05", 98°03'50")												
Oct. 8, 1968....	1415	215		11		4.7	873	7.5	26	5.9	71	1.4
Dec. 5.....	1130	331		2.6		3.0	626	7.4	12	8.9	82	5.9
Feb. 5, 1969....	1130	174		20		4.5	1,010	7.8	16	7.1	70	2.4
April 10.....	1310	147		17		4.5	1,080	7.8	24	6.2	73	2.2
May 15.....	1330	2,110		4.4		1.7	401	7.2	24	5.3	62	5.7
June 3.....	1600	159		18		6.9	1,100	7.7	26	5.5	67	3.1
June 12.....	1220	194		.6		3.8	1,000	7.6	27	5.5	68	1.6
July 12.....	1415	92		14		2.8	1,190	7.5	30	6.3	83	2.6
July 23.....	1200	98		20		10	1,130	7.7	30	6.0	79	1.6
Aug. 7.....	1200	105		14		7.3	1,140	7.9	29	7.5	96	1.6
Aug. 20.....	1330	92		16		7.8	1,110	8.1	30	7.4	96	2.7
Sept. 25.....	1320	1,210		10		.25	270	7.0	25	2.8	33	4.5
8-1885. SAN ANTONIO RIVER AT GOLIAD, TEXAS (28°38'58", 97°23'04")												
Oct. 8, 1968....	1720	361		0.6		4.6	1,180	7.7	26	7.6	93	1.3
Dec. 5.....	0840	1,380		6.7		1.0	369	7.5	10	9.4	84	5.1
Feb. 4, 1969....	1700	280		21		2.8	1,300	8.1	14	10.3	100	2.0
April 10.....	1010	335		14		10	1,200	7.9	24	8.0	94	2.3
May 15.....	1200	3,510		2.3		.96	228	7.7	22	6.1	69	3.8
June 3.....	1700	273		12		2.3	1,150	8.1	26	7.4	90	3.3
June 11.....	1430	439		.2		1.6	631	7.7	27	7.1	88	1.4
July 12.....	1610	153		2.2		2.2	1,410	8.4	32	11.0	149	7.3
July 23.....	1030	176		5.0		3.4	1,340	8.1	30	7.7	100	3.9
Aug. 5.....	2100	156		5.3		4.4	1,350	8.1	29	8.0	103	2.9
Aug. 20.....	1130	120		7.2		4.4	1,390	8.0	28	6.6	85	2.4
Sept. 25.....	1440	168		8.1		1.0	1,280	8.0	26	7.3	89	1.5
8-1888. GUADALUPE RIVER NEAR TIVOLI, TEXAS (28°30'20", 96°53'04")												
Oct. 9, 1968....	0800			3.8		1.7	780	7.7	26	6.0	73	0.9
Dec. 4.....	1445			5.7		1.9	582	7.9	14	9.6	91	2.3
Feb. 4, 1969....	1530			8.3		2.0	872	8.1	16	8.2	84	1.2
April 9.....	1710			7.4		2.2	815	7.9	25	7.7	92	2.5
June 11.....	1615			.3		1.0	512	7.7	28	6.2	78	2.3
Aug. 5.....	1840			1.7		1.0	782	8.0	32	7.0	95	1.7
8-1895. MISSION RIVER AT REFUGIO, TEXAS (28°17'30", 97°16'44")												
Oct. 8, 1968....	1830	44		1.1		0.24	3,240	7.3	25	6.0	71	3.4
Dec. 4.....	1600	17		7.0		.99	9,950	7.8	14	11.7	116	2.8
Feb. 4, 1969....	1615	8.2		6.4		.00	18,800	7.5	14	8.0	82	2.6
April 10.....	0915	18		2.8		.16	8,610	7.8	24	6.9	83	2.3
June 11.....	1515	37		.6		.17	3,600	7.7	30	8.9	119	2.9
Aug. 5.....	1750	4.6		2.5		.12	14,800	7.8	30	6.9	91	1.5
8-2100. NUECES RIVER NEAR THREE RIVERS, TEXAS (28°26'10", 98°11'10")												
Oct. 8, 1968....	1540	519		0.9		0.42	402	7.5	27	6.6	81	4.0
Dec. 5.....	1000	113		1.3		.48	1,170	7.9	11	10.9	98	2.0
Feb. 5, 1969....	1030	19		.4		.98	2,370	8.1	14	8.7	84	1.8
April 10.....	1150	18		.4		.67	2,220	8.2	25	8.8	105	4.4
June 12.....	1030	48		1.8		.60	1,320	7.9	27	7.9	98	2.7
Aug. 7.....	0930	.28		2.7		1.7	1,870	7.7	28	5.2	66	2.8

Table 2.--Pesticides in Texas surface waters, 1969

(Results are in micrograms per liter. DDT, DDD, and DDE concentrations include any isomers present. Herbicides are reported as acids.)

Date	Time (24 hour)	Discharge (cfs)	Insecticides										Herbicides		
			Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Chlordane	2,4-D	Silvex	2,4,5-T
7-2275. CANADIAN RIVER NEAR AMARILLO, TEXAS (35°28'10", 101°52'45")															
Oct. 3, 1968.....	1105	5.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	--	0.15	0.00	0.05
Dec. 4.....	1555	12	.00	.00	.00	.01	.01	.00	.00	.00	.04	0.00	.00	.00	.08
Feb. 10, 1969.....	1020	11	.00	.00	.00	.00	.02	.00	.00	.00	.07	.00	.14	.00	.00
May 1.....	1735	8.6	.00	.00	.00	.00	.00	.00	.00	.00	.07	.00	.60	.00	.02
7-2995.7. RED RIVER NEAR QUANAH, TEXAS (34°24'45", 99°44'00")															
Oct. 8, 1968.....	1035	100	0.00	0.01	0.01	0.05	0.00	0.00	0.00	0.00	0.01	--	0.00	0.01	0.04
Mar. 17, 1969.....	1515	105	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.00
May 26.....	--	16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.11	.00	.00
7-3160. RED RIVER NEAR GAINESVILLE, TEXAS (33°43'40", 97°09'35")															
Oct. 1, 1968.....	2100	871	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01	--	0.00	0.00	0.03
May 5, 1969.....	1350	5,550	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.13	.00	.04
June 13.....	1330	1,480	.00	.00	.00	.00	.00	.00	.00	.00	a.21	.00	.18	.00	.12
July 10.....	1015	460	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.02
Aug. 18.....	1145	260	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01
a Includes 0.20 µg/l α-BHC															
7-3432. SULPHUR RIVER NEAR TALCO, TEXAS (33°23'20", 95°07'50")															
Oct. 8, 1968.....	1310	20	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	--	0.07	0.01	0.00
April 9, 1969.....	2010	118	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.12	.00	.00
June 2.....	1440	136	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.13	.01	.03
July 8.....	1900	11	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.20
Aug. 13.....	1600	2.2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00	.20
7-3460.7. LITTLE CYPRESS CREEK NEAR JEFFERSON, TEXAS (32°42'46", 94°20'44")															
Oct. 7, 1968.....	1645	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.03
April 9, 1969.....	1215	2,570	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.00
June 2.....	1935	408	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
July 8.....	1425	9.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Aug. 13.....	0930	.13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8-0220. SABINE RIVER NEAR TATUM, TEXAS (32°22'11", 94°27'28")															
Oct. 7, 1968.....	1550	169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
April 9, 1969.....	1105	11,500	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.03
June 3.....	0745	9,280	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.07	.00	.03
July 8.....	1330	111	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Aug. 12.....	1800	81	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.15
8-0305. SABINE RIVER NEAR RULIFF, TEXAS (30°18'13", 93°44'37")															
Oct. 16, 1968.....	1300	4,580	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
April 14, 1969.....	1230	35,100	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	--	--	--
May 1.....	1820	30,900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03
June 5.....	1625	18,600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03
Aug. 27.....	2015	1,680	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.01
8-0410. NECHES RIVER AT EVADALE, TEXAS (30°21'22", 94°05'36")															
Oct. 16, 1968.....	1435	4,140	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
April 14, 1969.....	1545	21,900	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.00
May 2.....	1200	20,300	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
June 5.....	1250	21,300	.00	.00	.00	.04	.00	.00	.00	.00	.00	.00	--	--	--
Aug. 28.....	0850	2,060	.00	.00	.00	.06	.00	.00	.00	.00	.00	.00	.00	.00	.01

Table 2.--Pesticides in Texas surface waters, 1969--continued

(Results are in micrograms per liter. DDT, DDD, and DDE concentrations include any isomers present. Herbicides are reported as acids.)

Date	Time (24 hour)	Discharge (cfs)	Insecticides										Herbicides		
			Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Chlordane	2,4-D	Silvex	2,4,5-T
8-0625. TRINITY RIVER NEAR ROSSER, TEXAS (32°25'35", 96°27'45")															
Oct. 8, 1968.....	1850	450	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	--	0.51	0.00	0.15
April 8, 1969.....	1240	6,460	.00	.00	.00	.02	.01	.00	.00	.00	.01	0.07	.21	.00	.02
June 3.....	1435	9,110	.00	.00	.00	.00	.01	.00	.00	.00	.01	.04	.12	.00	.03
July 7.....	1655	1,950	.00	.00	.00	.01	.03	.00	.00	.00	a.05	.22	.00	.00	.03
Aug. 12.....	1130	418	.00	.01	.00	.00	.07	.00	.00	.00	b.16	.12	.83	.00	.69
a Includes 0.04 µg/l α-BHC															
b Includes 0.13 µg/l α-BHC															
8-0665. TRINITY RIVER AT ROMAYOR, TEXAS (30°25'30", 94°51'02")															
Oct. 16, 1968.....	1615	1,330	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.01	--	0.00	0.00	0.03
April 14, 1969....	1230	37,600	.00	.00	.00	.00	.01	.00	.00	.00	.00	0.00	.14	.00	.03
April 24.....	1200	25,200	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.20	.00	.03
June 5.....	1030	24,900	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.14	.00	.03
Aug. 22.....	1430	1,420	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.01
8-0720. LAKE HOUSTON AT MUNICIPAL INTAKE NEAR SHELDON, TEXAS (29°54'58", 95°08'28")															
Oct. 22, 1968....	1015		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.07	0.02	0.00
Dec. 24.....	1010		.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.00
Mar. 13, 1969....	1645		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
April 25.....	--		.00	.01	.00	.03	.06	.00	.00	.00	.05	.00	.09	.00	.09
June 9.....	0930		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02
July 14.....	0930		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04
Sept. 5.....	1340		.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04	.00	.01
8-0740. BUFFALO BAYOU AT HOUSTON, TEXAS (29°45'36", 95°24'30")															
Feb. 14, 1969....	1120	1,700	0.00	0.33	0.00	2.1	0.44	0.00	0.00	0.00	0.72	2.4	0.24	0.00	0.11
June 25.....	1245	39	.00	.05	.00	.01	.05	.00	.00	.00	.05	.08	.00	.00	.01
8-0745. WHITEOAK BAYOU AT HOUSTON, TEXAS (29°46'30", 95°23'49")															
Feb. 14, 1969....	1045	1,750	0.00	0.07	0.00	0.09	0.08	0.00	0.00	0.00	0.05	0.00	--	--	--
June 26.....	1300	9.5	.00	.04	.00	.03	.02	.00	.00	.00	a.14	.00	0.00	0.00	0.00
July 15.....	2240	600	.00	.51	.00	.36	.57	.00	.00	.00	.33	1.8	.10	.05	.65
a Includes 0.05 µg l α-BHC															
8-0748. WHEGANS BAYOU AT ROARK ROAD NEAR HOUSTON, TEXAS (29°39'23", 95°33'43")															
Oct. 21, 1968....	1430	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
April 11, 1969....	1345	2.6	.00	.00	.00	.00	.00	.00	.00	.00	.01	0.08	.26	.00	.00
May 23.....	1435	.56	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.21
8-0749. WILLOW WATERHOLE BAYOU AT LANDSDOWNE STREET, HOUSTON, TEXAS (29°39'01", 95°29'11")															
April 11, 1969....	1630	3.0	0.00	0.04	0.00	0.37	0.07	0.00	0.00	0.00	0.04	0.06	0.35	0.08	0.20
8-0750. BRAYS BAYOU AT HOUSTON, TEXAS (29°41'49", 95°24'43")															
Oct. 21, 1968....	1310	31	0.00	0.00	0.00	0.08	0.09	0.00	0.00	0.00	0.04	--	0.00	0.00	0.00
Feb. 14, 1969....	1030	2,670	.00	.05	.00	.15	.09	.00	.00	.00	.09	0.00	.39	.09	.11
April 11.....	1225	215	.00	.32	a	.29	.33	.00	.00	.00	.14	8.3	.28	.00	.23
May 5.....	1145	502	.00	.02	.04	.16	.05	.00	.00	.00	.03	.28	.00	.00	.19
May 5.....	1240	1,800	.00	.03	.07	.27	.07	.00	.00	.00	.09	.42	--	--	--
May 5.....	1500	1,400	.00	.03	.10	.18	.05	.00	.00	.00	.11	.36	--	--	--
June 26.....	1420	40	.00	.01	.00	.02	.08	.00	.00	.00	b.17	.08	.42	.02	.07
a Not detectable due to chlordane and dieldrin interference.															
b Includes 0.10 µg l α-BHC															
8-0755. SINS BAYOU AT HOUSTON, TEXAS (29°40'27", 95°17'21")															
June 26, 1969....	2005	19	0.00	0.02	0.00	0.02	0.08	0.00	0.00	0.00	a.0.08	0.05	0.00	0.00	0.02
a Includes 0.04 µg l α-BHC															



Table 2.--Pesticides in Texas surface waters, 1969--continued

(Results are in micrograms per liter. DDT, DDD, and DDE concentrations include any isomers present. Herbicides are reported as acids.)

Date	Time (24 hour)	Discharge (cfs)	Insecticides										Herbicides		
			Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Chlordane	2,4-D	Silvex	2,4,5-T
8-0756.5. BERRY BAYOU AT FOREST OAKS STREET, HOUSTON, TEXAS (29°40'35", 95°14'37")															
May 23, 1969.....	1140	6.6	0.00	0.05	0.00	0.06	0.09	0.00	0.00	0.00	0.21	0.31	0.00	0.00	0.09
8-0757.7. HUNTING BAYOU AT U. S. HIGHWAY 90A, HOUSTON, TEXAS (29°47'43", 95°16'21")															
April 25, 1969....	1500	5.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.20	0.00	0.00
June 26.....	2100	2.5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Aug. 18.....	2250	267	.00	.10	.00	.09	.06	.00	.00	.00	a.08	.15	2.0	.00	.16
a Includes 0.06 µg/l of α-BHC															
8-0760. GREENS BAYOU NEAR HOUSTON, TEXAS (29°55'05", 95°18'24")															
Feb. 14, 1969.....	0850	200	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
June 26.....	1640	3.2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
a Aug. 18.....	2015	146	.00	.40	.00	.30	.60	.00	.00	.00	b.20	.52	.00	.00	.13
a Sample contained 7 µg/l Toxaphene. b Includes 0.04 µg/l of α-BHC															
8-0765. HALLS BAYOU AT HOUSTON, TEXAS (29°51'42", 95°20'05")															
April 23, 1969....	1345	8.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.04	0.06
June 26.....	1800	3.3	.00	.01	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00
July 15.....	2340	53	.00	.03	.00	.05	.06	.00	.00	.00	.10	.19	.00	.00	.28
8-0873. CLEAR FORK BRAZOS RIVER AT ELIASVILLE, TEXAS (32°57'30", 98°46'10")															
Dec. 11, 1968.....	1530	17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.4	0.00	0.05
May 6, 1969.....	1030	17,500	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.02
June 11.....	1800	135	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05
July 14.....	1920	5.6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.07
8-0880. BRAZOS RIVER NEAR SOUTH BEND, TEXAS (33°01'30", 98°38'50")															
Oct. 3, 1968.....	0925	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.04	0.00
May 7, 1969.....	1015	24,600	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.03
June 12.....	0800	241	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03
July 14.....	1700	25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04
Aug. 22.....	0810	2.3	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.12
8-0965. BRAZOS RIVER AT WACO, TEXAS (31°33'40", 97°07'42")															
Oct. 9, 1968.....	1800	2,050	0.00	0.01	0.01	0.09	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
Dec. 20.....	1015	398	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.00
Mar. 12, 1969....	0730	3,070	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02
April 23.....	0950	9,370	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.00	.02
June 2.....	1700	4,550	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.16	.00	.05
July 17.....	1012	1,470	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Sept. 23.....	1220	2,180	.00	.01	.00	.02	.00	.00	.00	.00	.01	.00	--	--	--
8-1140. BRAZOS RIVER AT RICHMOND, TEXAS (29°34'56", 95°45'27")															
Oct. 7, 1968.....	1330	3,590	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.02
Nov. 26.....	1245	1,920	.00	.00	.01	.01	.00	.00	.00	.00	.00	0.00	.00	.00	.00
Dec. 23.....	1210	7,400	.00	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
Jan. 28, 1969....	1320	2,600	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Mar. 13.....	1115	8,760	.00	.01	.02	.04	.00	.00	.00	.00	.00	.00	.00	.00	.02
April 18.....	0925	33,700	.00	.01	.05	.04	.00	.00	.00	.00	.00	.00	.18	.00	.04
June 6.....	1415	12,200	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.02
June 13.....	1320	6,320	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.06	.00	.02
July 22.....	1115	2,200	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Aug. 19.....	1345	1,520	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

Table 2.--Pesticides in Texas surface waters, 1969--continued

(Results are in micrograms per liter. DDT, DDD, and DDE concentrations include any isomers present. Herbicides are reported as acids.)

Date	Time (24 hour)	Discharge (cfs)	Insecticides										Herbicides			
			Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Chlordane	2,4-D	Silvex	2,4,5-T	
8-1166.5. BRAZOS RIVER NEAR ROSHARON, TEXAS (29°20'58", 95°34'56")																
Oct. 9, 1968.....	1300	5,600	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
April 23, 1969....	1735	24,400	.00	.00	.03	.01	.00	.00	.00	.00	.00	.01	0.00	.20	.00	.02
June 6.....	1230	11,500	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02
July 10.....	1605	2,950	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Aug. 27.....	1225	665	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10
8-1365. CONCHO RIVER NEAR PAINT ROCK, TEXAS (31°31'05", 99°55'10")																
Oct. 8, 1968.....	1300	6.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mar. 24, 1969....	1025	38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.00
8-1470. COLORADO RIVER NEAR SAN SABA, TEXAS (31°13'05", 98°33'50")																
Oct. 3, 1968.....	1645	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
April 30, 1969....	1115	277	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.00
June 30.....	1200	437	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.13
Aug. 29.....	1000	514	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.06
8-1620. COLORADO RIVER AT WHARTON, TEXAS (29°18'30", 96°06'15")																
Oct. 1, 1968.....	1400	579	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
Dec. 19.....	1215	680	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.02
Jan. 21, 1969....	1440	845	.00	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Mar. 5.....	1255	1,430	.01	.00	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
April 23.....	0745	3,870	.00	.00	.01	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
June 4.....	0950	2,050	.00	.00	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03
June 13.....	1045	1,380	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
July 9.....	0950	1,150	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Aug. 21.....	1745	900	.00	.00	.00	.02	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
8-1640. LAVACA RIVER NEAR EDNA, TEXAS (28°57'35", 96°41'10")																
Oct. 9, 1968.....	1000	43	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
Feb. 4, 1969.....	1200	59	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.00
April 9.....	1220	124	.00	.00	.01	1.6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
June 11.....	1200	119	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08	.00	.02
Aug. 5.....	1610	35	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8-1645. NAVIDAD RIVER NEAR CANADO, TEXAS (29°01'32", 96°33'08")																
Oct. 9, 1968.....	1030	113	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	--	0.00	0.03	0.00
Feb. 4, 1969.....	1145	65	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.00
April 9.....	1115	96	.00	.00	.02	2.3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
June 11.....	1130	115	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Aug. 5.....	1515	97	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
8-1765.2. GUADALUPE RIVER BELOW VICTORIA, TEXAS (28°45'10", 97°00'30")																
Oct. 9, 1968.....	0910	903	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
Feb. 4, 1969.....	1430	933	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.00
April 9.....	1400	1,220	.00	.00	.02	2.7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
June 11.....	1300	1,730	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	.00	.02
Aug. 5.....	1700	681	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
8-1777. OLNOS CREEK AT DRESDEN DRIVE AT SAN ANTONIO, TEXAS (29°29'56", 98°30'36")																
Nov. 27, 1968....	1045	4.4	0.00	0.01	0.02	0.05	0.00	0.00	0.00	0.00	0.01	0.00	0.29	0.00	0.00	0.12
Feb. 13, 1969....	1430	32	.00	.06	.00	.09	.05	.00	.00	.00	.01	.13	.00	.00	.00	.02
Mar. 15.....	1210	68	.00	.02	.00	.06	.03	.00	.00	.00	.02	.18	.00	.00	.00	.07
May 3.....	0915	194	.00	.02	.00	.08	.03	.00	.00	.00	.03	.13	.00	.00	.00	.36
May 16.....	1350	106	.00	.03	.00	.11	.06	.00	.00	.00	.02	.15	.18	.00	.00	.13
June 24.....	1045	63	.00	.02	.01	.08	.02	.00	.00	.00	.01	.06	.00	.00	.00	.42

Table 2.--Pesticides in Texas surface waters, 1969--continued

(Results are in micrograms per liter. DDT, DDD, and DDE concentrations include any isomers present. Herbicides are reported as acids.)

Date	Time (24 hour)	Discharge (cfs)	Insecticides										Herbicides		
			Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Chlordane	2,4-D	Silvex	2,4,5-T
8-1778. OLMOS RESERVOIR AT SAN ANTONIO, TEXAS (29°28'30", 98°28'23")															
Mar. 15, 1969.....	1455		0.00	0.06	0.00	0.09	0.05	0.00	0.00	0.00	0.02	0.16	0.00	0.00	0.13
8-1780. SAN ANTONIO RIVER AT SAN ANTONIO, TEXAS (29°24'33", 98°29'38")															
Nov. 27, 1968.....	1315	217	0.00	0.02	0.04	0.22	0.03	0.00	0.00	0.00	0.01	a	0.00	0.00	0.12
Feb. 13, 1969.....	1600	245	.00	.21	.00	.49	.07	.00	.03	.00	.02	0.28	.00	.00	.09
Mar. 15.....	1430	347	.00	.19	.13	.41	.06	.00	.00	.00	.12	.52	.18	.00	.09
May 3.....	1620	550	.00	.14	.00	.33	.14	.00	.00	.00	.03	.23	.00	.00	.33
June 24.....	1345	60	.00	.05	.01	.09	.03	.00	.00	.00	.01	.06	.28	.00	.13
a Chlordane present at less than 0.10 µg/l.															
8-1783. ALAZAN CREEK AT ST. CLOUD STREET AT SAN ANTONIO, TEXAS (29°27'29", 98°32'59")															
Nov. 27, 1968.....	0905	5.0	0.00	0.09	0.02	0.18	0.03	0.00	0.00	0.00	0.01	a	0.00	0.00	0.00
Feb. 13, 1969.....	1525	17	.00	.08	.00	.18	.03	.00	.01	.00	.01	0.09	.00	.00	.11
Mar. 15.....	1310	6.6	.00	.04	.08	.10	.02	.00	.00	.00	.01	.05	.00	.00	.13
May 3.....	1035	9.6	.00	.06	.01	.12	.04	.00	.00	.00	.04	.06	.00	.00	.32
May 16.....	1150	118	.00	.04	.01	.18	.03	.00	.00	.00	.02	.08	.00	.00	.59
May 16.....	1245	40	.00	.02	.01	.10	.04	.00	.00	.00	.01	.07	.19	.00	.70
a Chlordane present at less than 0.03 µg/l.															
8-1786. PANTHER SPRINGS CREEK AT FARM ROAD 2696. SAN ANTONIO, TEXAS (29°37'31", 98°31'06")															
May 16, 1969.....	1205	4,190	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May 16.....	1335	847	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00
May 16.....	1615	77	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8-1786.9. SALADO CREEK TRIBUTARY AT BITTERS ROAD, SAN ANTONIO, TEXAS (29°31'36", 98°26'25")															
Nov. 27, 1968.....	1259	2.7	0.00	0.02	0.04	0.09	0.05	0.00	0.00	0.00	0.01	a	0.00	0.00	0.00
Feb. 13, 1969.....	1300	6.5	.00	.04	.00	.21	.03	.00	.00	.01	.01	0.06	.27	.09	.02
Mar. 15.....	1105	1.8	.00	.04	.11	.62	.04	.00	.00	.04	.14	.06	.18	.04	.05
May 16.....	1030	10	.00	.03	.00	.25	.04	.00	.00	.00	.02	.20	.00	.00	.05
June 24.....	0835	2.5	.00	.00	.00	.09	.13	.00	.00	.00	.03	.12	.25	.11	.62
a Chlordane present at less than 0.15 µg/l.															
8-1787. SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TEXAS (29°30'57", 98°25'51")															
Nov. 27, 1968.....	1219	5.8	0.00	0.00	0.01	0.08	0.00	0.00	0.00	0.00	0.00	a	0.00	0.00	0.00
Feb. 13, 1969.....	1325	2.7	.00	.01	.00	.02	.00	.00	.00	.00	.00	0.00	.99	.00	.55
Mar. 15.....	1130	7.5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.14	.00	.14
May 3.....	1220	55	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.6	.14	.73
May 12.....	1900	12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.9	.14	.73
May 16.....	1440	90	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.84	.09	.29
May 16.....	2125	1,240	.00	.00	.01	.00	.01	.00	.00	.00	.00	.00	.20	.00	.06
May 17.....	0940	95	.00	.00	.00	.00	.01	.00	.00	.00	.01	.00	.20	.00	.09
June 24.....	0910	12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03
a Chlordane present at less than 0.03 µg/l.															
8-1788. SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TEXAS (29°21'25", 98°24'45")															
Nov. 27, 1968.....	1516	99	0.00	0.01	0.01	0.05	0.00	0.00	0.00	0.00	0.00	a	0.00	0.00	0.00
Feb. 13, 1969.....	1704	45	.00	.05	.01	.09	.01	.00	.00	.00	.02	0.00	.00	.00	.05
Mar. 15.....	1605	400	.00	.04	.07	.09	.02	.00	.00	.00	.02	.19	.00	.06	.05
May 3.....	1510	485	.00	.06	.02	.09	.04	.00	.00	.00	.03	.11	.12	.06	.07
May 17.....	1215	464	.00	.07	.00	.04	.04	.00	.00	.00	.02	.08	.99	.08	.23
June 24.....	1500	117	.00	.01	.00	.01	.01	.00	.00	.00	.00	.02	--	--	--
a Chlordane present at less than 0.03 µg/l.															
8-1814. HELOTES CREEK AT HELOTES, TEXAS (29°34'44", 98°41'29")															
May 12, 1969.....	1750	3.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.03
May 16.....	1530	98	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.26	.00	.05
May 17.....	1420	42	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

Table 2.--Pesticides in Texas surface waters, 1969--continued

(Results are in micrograms per liter. DDT, DDD, and DDE concentrations include any isomers present. Herbicides are reported as acids.)

Date	Time (24 hour)	Discharge (cfs)	Insecticides										Herbicides		
			Aldrin	DDD	DDE	DDT	Dieldrin	Endrin	Heptachlor	Heptachlor epoxide	Lindane	Chlordane	2,4-D	Silvex	2,4,5-T
8-1818. SAN ANTONIO RIVER NEAR ELMENDORF, TEXAS (29°14'15", 98°21'43")															
Oct. 8, 1968.....	1300	191	0.00	0.03	0.00	0.00	0.02	0.00	0.00	0.00	0.00	--	0.00	0.00	0.03
Feb. 5, 1969.....	1230	108	.00	.01	.00	.00	.01	.00	.00	.00	.02	0.00	.00	.00	.00
April 10.....	1410	85	.00	.01	.00	.05	.02	.00	.00	.00	.03	.00	.00	.09	.04
June 12.....	1320	136	.00	.02	.00	.00	.02	.00	.00	.00	.03	.00	.00	.00	.05
Aug. 7.....	1310	74	.00	.01	.00	.00	.04	.00	.00	.00	.04	.00	.00	.00	.01
8-1885. SAN ANTONIO RIVER AT GOLIAD, TEXAS (28°38'58", 97°23'04")															
Oct. 8, 1968.....	1720	361	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01	--	0.00	0.00	0.00
Feb. 4, 1969.....	1700	280	.00	.01	.00	.00	.00	.00	.00	.00	.01	0.00	.00	.00	.00
April 10.....	1010	335	.00	.01	.00	.10	.01	.00	.00	.00	.01	.00	.00	.00	.03
June 11.....	1430	439	.00	.01	.00	.01	.01	.00	.00	.00	.01	.00	.08	.00	.04
Aug. 5.....	2100	156	.00	.00	.00	.00	.01	.00	.00	.00	.01	.00	.00	.00	.00
8-2100. NUECES RIVER NEAR THREE RIVERS, TEXAS (28°26'10", 98°11'10")															
Oct. 8, 1968.....	1540	519	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
Feb. 5, 1969.....	1030	19	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.00	.00
April 10.....	1150	18	.00	.03	.02	3.3	.00	.00	.00	.00	.00	.00	.22	.00	.00
June 12.....	1030	48	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.07
Aug. 7.....	0930	.28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
8-4465. PECOS RIVER NEAR GIRVIN, TEXAS (31°06'35", 102°25'00")															
Nov. 20, 1968.....	1420	24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
May 6, 1969.....	1450	28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
July 22.....	1430	9.4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8-4692. RIO GRANDE BELOW ANZALDUAS DAM, TEXAS (26°08'00", 98°20'05")															
Oct. 15, 1968.....	0745	540	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
Nov. 20.....	1010	2,240	.00	.00	.00	.00	.00	.00	.00	.00	.00	0.00	.00	.02	.00
Dec. 26.....	1240	1,320	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Jan. 16, 1969.....	0830	3,090	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Feb. 17.....	1020	650	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Mar. 13.....	0930	381	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
April 14.....	1135	1,400	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
May 15.....	0805	501	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
June 19.....	0740	4,310	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
July 16.....	0735	1,910	.00	.02	.01	.01	.00	.00	.00	.00	.01	.00	.00	.00	.00
Aug. 27.....	0850	509	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
Sept. 18.....	0730	699	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8-4703. ARROYO COLORADO AT EL FUSTE, TEXAS (26°07'24", 97°54'33")															
May 29, 1969.....	0915	64	0.00	0.02	0.05	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
June 19.....	1400	88	.00	.02	.03	.00	.01	.00	.00	.00	.01	.00	.00	.00	.05
July 16.....	0915	89	.00	.03	.06	.02	.00	.00	.00	.00	.01	.00	.00	.00	.00
Aug. 27.....	1145	55	.00	.01	.03	.04	.01	.01	.00	.00	b.04	.00	.00	.00	.06
Sept. 18.....	0935	59	.00	.01	.02	.01	.01	.00	.00	.00	.00	.00	.00	.00	.01

a Sample also contains 0.63 µg/l of methyl parathion and 0.19 µg/l of parathion.

b Includes 0.02 µg/l of α-BHC.