

# TEXAS WATER COMMISSION

Joe D. Carter, Chairman  
O. F. Dent, Commissioner  
H. A. Beckwith, Commissioner



## Circular No. 62-01

### THE PRESENT RECONNAISSANCE STUDY PROGRAM OF THE CHEMICAL QUALITY OF STREAMS IN TEXAS

A Part of the Cooperative Program  
of the Texas Water Commission and the  
U. S. Geological Survey

April 1962

TEXAS WATER COMMISSION

Joe D. Carter, Chairman  
O. F. Dent, Commissioner  
H. A. Beckwith, Commissioner

Circular No. 62-01

THE PRESENT RECONNAISSANCE STUDY  
PROGRAM OF THE CHEMICAL QUALITY  
OF STREAMS IN TEXAS

A Part of the Cooperative Program  
of the Texas Water Commission and the  
U. S. Geological Survey

April 1962

TABLE OF CONTENTS

	Page
INTRODUCTION.....	1
CANADIAN RIVER BASIN.....	5
RED RIVER BASIN.....	5
SABINE RIVER BASIN.....	6
NECHES RIVER BASIN.....	7
TRINITY RIVER BASIN.....	8
SAN JACINTO RIVER BASIN.....	9
BRAZOS RIVER BASIN.....	10
COLORADO RIVER BASIN.....	12
LAVACA RIVER BASIN.....	12
GUADALUPE-SAN ANTONIO RIVER BASINS.....	13
NUECES RIVER BASIN.....	13
RIO GRANDE BASIN.....	14
COASTAL AREAS.....	15

THE PRESENT RECONNAISSANCE STUDY  
PROGRAM OF THE CHEMICAL QUALITY  
OF STREAMS IN TEXAS

INTRODUCTION

Water quality is affected by climate, particularly total rainfall, by geology, topography, and cultural factors. In planning for any water utilization project, it is necessary to know the quality of the water which will be available. Chemical-quality data are of particular importance to municipalities and industries in order to determine whether the water is of satisfactory quality for the uses intended. Also, in determining the suitability of water for irrigation, the chemical quality is of primary importance.

Among the many problems requiring the use of chemical-quality data for their solution are: (1) the location and determination of the magnitude of natural mineralization of the surface-water resources of the state; (2) the detection and control of man-made pollution of surface-water supplies; (3) salt-water encroachment into coastal streams; (4) re-use of water; and (5) demineralization of water.

A partial network of daily chemical-quality sampling stations is operated on streams throughout Texas, but funds have never been adequate for a complete inventory of the chemical quality of the surface waters of the state. In order that vitally needed information on the chemical quality of all significant streams in the state may be made available to the people, a reconnaissance study to supplement the daily-station network was begun in September 1961.

This study is financed on a fifty-fifty basis by funds appropriated to the Texas Water Commission and the U. S. Geological Survey. The quality-of-water information obtained in the reconnaissance study, particularly at sites where water-development projects are planned or are in operation and where no information on the quality of water is now available, will be invaluable in the planning of water developments and the wise management of the water resources of the state. The data collected at the reconnaissance sampling sites will aid in the delineation of problem areas and the identification of probable sources of pollution. Also, the studies will bring to light those areas where more detailed investigations are needed. The planning and execution of these more intensive investigations will be enhanced by the data obtained during the reconnaissance studies.

A reconnaissance report summarizing the surface-water quality is planned for each of the major river basins of the state. One or more of these reports will be prepared each year, beginning with a report on the Sabine River Basin in the 1963 State fiscal year. Reports for the Neches and San Jacinto Basins will be completed at the end of the 1964 fiscal year, and during subsequent years reports will be prepared on the remaining river basins.

Sampling during the first year of the reconnaissance program will cover the entire state, with emphasis on sampling at sites of reservoirs that are listed in the Water Commission's 1961 Planning Report for completion by 1980 plus some additional future reservoir sites listed in master plan reports of various river authorities. Four to twelve samples will be collected during the year at a point near the site of each proposed reservoir.

Samples will be collected over a range of water discharge. At low flows, concentrations of dissolved minerals are likely to be highest, and the analyses of low-flow samples will indicate where pollution and salinity problems exist.

Samples of medium and high flows will indicate the probable quality of the water that will be stored in the reservoirs. Where possible, stream-gaging stations and partial-record stations will be used as sampling sites so that discharge data may be available for possible correlation of chemical quality with streamflow. At other sites special streamflow measurement will usually be made when the samples are collected.

Data for chemical analyses of water which may have been made by other responsible groups will be used in the investigation when appropriate stream discharge data is available.

During 1962, sampling in the Sabine River Basin will be more intensive than in other basins. Thus, data needed for the report which is scheduled the following year will be available. In addition to sampling at proposed reservoir sites, reconnaissance samples will be collected from the principal streams in each basin. Also, each principal existing reservoir will be sampled. These samples will provide the best possible measure of the chemical quality of the composite water yield of the watershed above the reservoirs. In the second year of the reconnaissance program, the sampling will be intensified in the Neches and San Jacinto River Basins, for which reports are scheduled in 1964.

Reports for the river basins in the eastern portion of the state were scheduled for completion first as data for a more complete range of high and low flow conditions could be obtained in those basins in a shorter period of time. The tentative scheduling of reports is listed on the following page.

Schedule of River Basin Reports  
of the Reconnaissance Program,  
by State Fiscal Years

Canadian River Basin	1968
Red River Basin	1966
Sabine River Basin	1963
Neches River Basin	1964
Trinity River Basin	1965
San Jacinto River Basin	1964
Brazos River Basin	1965
Colorado River Basin	1966
Lavaca River Basin	1967
Guadalupe-San Antonio River Basins	1967
Nueces River Basin	1967
Rio Grande Basin	1968
Coastal Areas	1968

Chemical-quality records now available are listed in statements on the following pages and the work currently being done in each major river basin is described. The details of reconnaissance sampling in 1962 and plans for sampling in future years are given. Schedules of sampling are tentative, and actual collection of samples at specific sites will depend on runoff and other hydrologic conditions. Appraisals of the adequacy of the sampling program will be made as data become available and the program will be adjusted to correct apparent deficiencies.

Prior to the completion of the reports, the data obtained in this reconnaissance program will be available for use by anyone desiring same.

CANADIAN RIVER BASIN

1. Daily records available:

Canadian River near Tascosa	June 1948 - September 1953
Canadian River near Amarillo	February 1950 -
Canadian River near Borger	September 1950 - October 1951

2. Reconnaissance sampling, 1962 fiscal year:

<u>Reservoir</u>	<u>Sampling site</u>	<u>Number of samples</u>
Palo Duro	Palo Duro Creek near Spearman	4

3. Future sampling and report schedule:

Reconnaissance sampling will be increased slightly during 1963, and remain at that level through 1967. A report is scheduled in 1968.

RED RIVER BASIN

1. Daily records available:

Prairie Dog Town Fork Red River near Brice	August 1949 - July 1951
Mulberry Creek near Brice	August 1949 - July 1951
Salt Fork Red River near Hedley	March 1956 - September 1961
Salt Fork Red River near Wellington	June 1952 - September 1954
Elm Creek near Shamrock	October 1946 - December 1947
Quitaque Creek near Quitaque	November 1945 - November 1946
Pease River near Crowell	July 1942 - June 1943
Little Wichita River near Archer City	January 1953 - January 1956
Little Wichita River near Henrietta	January 1953 - January 1956, March 1959 -
Little Wichita River near Ringgold	March 1959 -
Red River near Gainesville	May 1944 - September 1947
Red River at Denison Dam near Denison	May 1944 -
South Sulphur River near Cooper	October 1958 -
Sulphur River near Darden	October 1947 - January 1950

2. Reconnaissance sampling, 1962 fiscal year:

<u>Reservoirs</u>	<u>Sampling sites</u>	<u>Number of samples</u>
Buffalo Creek	Buffalo Creek near Iowa Park	6
Paris	Sanders Creek near Chicota	6
Pine	Big Pine Creek near Manchester	3
Barkman Creek	Barkman Creek near Leary	6

3. Future sampling and report schedule:

Reconnaissance sampling in 1963 will be decreased slightly. The scope of the sampling will be increased in 1964 and 1965, and a report prepared in 1966.

SABINE RIVER BASIN

1. Daily records available:

Sabine River near Emory	July 1952 - September 1954
Sabine River near Tatum	February 1952 -
Sabine River at Logansport, La.	August 1939 - January 1941, October 1941 - September 1942, December 1943 - August 1945
Sabine River near Ruliff	October 1945 - September 1946, October 1947 -
Cow Bayou near Mauriceville	March 1952 - December 1955

2. Reconnaissance sampling, 1962 fiscal year:

<u>Reservoir</u>	<u>Sampling sites</u>	<u>Number of samples</u>
Lake Fork	Lake Fork Sabine River near Quitman	12
Big Sandy	Big Sandy Creek near Big Sandy	12
Kilgore	Wilds Creek near Laird Hill	4
Cherokee No. 2	Cherokee Bayou near Oak Hill	4

Other sampling in Sabine River Basin for comprehensive coverage:

Martins Creek near Beckville	4
Eight Mile Creek at U. S. Highway 59 near Tatum	4
Socagee Creek near Carthage	4
Flat Fork near Center	4
Tenaha Creek near Shelbyville	4
Patroon Bayou near Milam	4
Palo Gaucho Bayou near Hemphill	4
Housen Bayou near Yellowpine	4
Sandy Creek near Yellowpine	4
Little Cow Creek near Burkeville	4
Big Cow Creek near Newton	4
Nichols Creek near Buna	4
Cypress Creek near Buna	4
Lake Tawakoni	4
Lake Gladewater	2
Lake Cherokee	2
Murvaul Reservoir	2
Greenville Reservoir	2

3. Future sampling and report schedule:

The reconnaissance sampling program will be completed in 1962 and a report prepared in 1963.

NECHES RIVER BASIN

1. Daily records available:

Neches River near Alto	October 1959 -
Angelina River near Lufkin	October 1954 -
Neches River near Rockland	October 1941 - September 1942, September 1945 - September 1947
Neches River at Evadale	October 1947 -

2. Reconnaissance sampling, 1962 fiscal year:

<u>Reservoir</u>	<u>Sampling sites</u>	<u>Number of samples</u>
Flat Creek	Flat Creek at FM Road 607 near Athens	6
Mud Creek	Mud Creek near Jacksonville	6
Ponta	Angelina River near Alto	12

3. Future sampling and report schedule:

The reconnaissance sampling in 1963 will be at about triple the 1962 rate. A report is scheduled for 1964.

TRINITY RIVER BASIN

1. Daily records available:

Clear Fork Trinity River at Fort Worth	October 1948 - September 1952
Trinity River near Rosser	October 1954 -
Cedar Creek near Mabank	April 1956 - September 1957
Chambers Creek near Corsicana	September 1961 -
Richland Creek near Fairfield	April 1956 -
Trinity River near Oakwood	October 1947 - September 1954
Trinity River at Romayor	October 1945 - November 1949, February 1950 - September 1951, October 1953 -
Trinity River near Moss Bluff	October 1949 -
Old River near Cove	October 1949 -
Trinity River at Anahuac	October 1949 -
Trinity Bay at mouth of Trinity River near Anahuac	October 1950 -

2. Reconnaissance sampling, 1962 fiscal year:

<u>Reservoirs</u>	<u>Sampling sites</u>	<u>Number of samples</u>
Aubrey	Elm Fork Trinity River near Sanger	12
Aubrey	Isle du Bois Creek near Pilot Point	4
Lavon Enlargement	Lavon Reservoir	2
Bardwell	Waxahachie Creek near Bardwell	12
Tehuacana	Tehuacana Creek near Fairfield (2 channels)	6
Upper Keechi	Upper Keechi Creek near Oakwood	12
Big Elkhart	Big Elkhart Creek near Grapeland	3
Lower Keechi	Lower Keechi Creek near Centerville	3
Bedias	Bedias Creek near Madisonville	3
Gail	Gail Creek near Lovelady	3
Long King	Long King Creek near Livingston	3

3. Future sampling and report schedule:

Reconnaissance sampling will be reduced about one-third in 1963, then expanded to intensive coverage in 1964. The report will be prepared in 1965.

SAN JACINTO RIVER BASIN

1. Daily records available:

West Fork San Jacinto River near Conroe	September 1961 -
West Fork San Jancinto River near Humble	October 1941 - September 1946
San Jacinto River near Huffman	September 1945 - July 1948, December 1948 - April 1954

2. Reconnaissance sampling, 1962 fiscal year:

<u>Reservoir</u>	<u>Sampling sites</u>	<u>Number of samples</u>
Honea	West Fork San Jacinto River west of Conroe	6
Cleveland	East Fork San Jacinto River near Cleveland	12

3. Future sampling and report schedule:

Reconnaissance sampling in 1963 will be double the 1962 rate. A report will be prepared in 1964.

BRAZOS RIVER BASIN

1. Daily records available:

Double Mountain Fork Brazos River near Rotan	December 1949 - September 1951
Double Mountain Fork Brazos River near Aspermont	October 1948 - November 1951, September 1956 -
Salt Fork Brazos River near Peacock	December 1949 - September 1951
Croton Creek near Jayton	July 1959 -
Salt Croton Creek near Aspermont	October 1956 -
Salt Fork Brazos River near Aspermont	October 1948 - October 1951, October 1956 -
Brazos River at Seymour	August 1959 -
Clear Fork Brazos River at Nugent	August 1948 - September 1953
Paint Creek near Haskell	December 1949 - September 1951
Clear Fork Brazos River at Fort Griffin	November 1949 - September 1951
Hubbard Creek near Albany	February 1962 -
North Prong Hubbard Creek near Albany	February 1962 -
Big Sandy Creek near Breckenridge	February 1962 -
Hubbard Creek near Breckenridge	April 1955 -
Clear Fork Brazos River at Eliasville	October 1961 -
Brazos River near South Bend	January 1942 - March 1948
Salt Creek at Olney	April 1958 - September 1960
Salt Creek near Newcastle	April 1958 - March 1960
Brazos River at Possum Kingdom Dam near Graford	January 1942 -
Brazos River near Whitney	October 1947 - May 1948, October 1948 -
Leon River near Eastland	September 1950 - September 1953
Lampasas River at Youngsport	September 1961 -
Lampasas River near Belton	April 1943 - June 1944
Little River at Cameron	October 1959 -
Brazos River at State Highway 21 near Bryan	August 1961 -
Yegua Creek near Somerville	September 1961 -
Navasota River near Easterly	January to December 1942
Navasota River near Bryan	October 1958 -
Brazos River at Richmond	October 1945 -
Brazos River at Harris Reservoir near Angleton	January 1962 -
Brazos River at Brazoria Reservoir near Brazoria	January 1962 -

BRAZOS RIVER BASIN--Continued

2. Reconnaissance sampling, 1962 fiscal year:

<u>Reservoirs</u>	<u>Sampling sites</u>	<u>Number of samples</u>
White River	White River near Crosbyton	6
Millers Creek	Millers Creek near Seymour	12
Keechi Creek	Keechi Creek near Graford	6

In addition 6 to 12 samples will be collected at each of 16 sites as part of a project in cooperation with the Brazos River Authority:

Croton Creek near Jayton (3 sites)  
 Salt Croton Creek near Aspermont (3 sites)  
 Palo Pinto Creek near Sonto  
 Paluxy Creek at Glen Rose  
 Aquilla Creek near Aquilla  
 North Bosque River near Clifton  
 Middle Bosque River near McGregor  
 Leon River near Hasse  
 Lake Belton  
 North Fork San Gabriel River at Georgetown  
 South Fork San Gabriel River at Georgetown  
 San Gabriel River at Georgetown

3. Future sampling and report schedule:

Sampling will be continued at a reduced rate during the 1963 and 1964 fiscal years. A report is scheduled for 1965 as a part of the Brazos River Authority project. Two reports on quality of surface waters of the Brazos River basin are in process of being reviewed: "Chemical Quality of Surface Waters of the Brazos River Basin in Texas," by Burdge Irelan and H. B. Mendieta, and "Natural Sources of Salinity in the Brazos River, Texas, with Particular Reference to the Salt Croton and Croton Creek Basins," by R. C. Baker, L. S. Hughes, and I. D. Yost.

COLORADO RIVER BASIN

1. Daily records available:

Colorado River above Bull Creek near Knapp	April 1950 - December 1952
Bull Creek near Ira	April 1950 - January 1954
Bluff Creek near Ira	April to September 1950
Colorado River near Ira	November 1958 -
Deep Creek near Dunn	April 1953 - September 1954
Colorado River at Colorado City	May 1946 - September 1954, November 1956 -
Morgan Creek near Colorado City	May 1947 - July 1949
Beals Creek near Westbrook	November 1958 -
Colorado River near Silver	October 1956 -
Colorado River at Robert Lee	October 1947 - October 1951
Oak Creek near Blackwell	December 1949 - July 1950
Colorado River at Ballinger	September 1961 -
Colorado River near San Saba	September 1947 -
Colorado River at Austin	October 1947 -
Colorado River at Wharton	April 1944 -

2. Reconnaissance sampling, 1962 fiscal year:

<u>Reservoir</u>	<u>Sampling sites</u>	<u>Number of samples</u>
Twin Buttes	Middle Concho River above Tankersly	3
San Angelo	North Concho River near Carlsbad	3
Jim Ned	Jim Ned Creek at U. S. 283 near Coleman	6
Brady	Brady Creek at Brady	4

3. Future sampling and report schedule:

Reconnaissance sampling in 1963 and 1964 will be limited to the four reservoir sites. The basin will be sampled intensively in 1965 and a report prepared in 1966.

LAVACA RIVER BASIN

1. Daily records available:

Navidad River near Ganado	October 1959 -
---------------------------	----------------

2. Reconnaissance sampling, 1962 fiscal year:

<u>Reservoir</u>	<u>Sampling site</u>	<u>Number of samples</u>
Edna	Lavaca River near Edna	4

3. Future sampling and report schedule:

Reconnaissance sampling will be stepped up slightly from 1963 to 1966, and a report prepared in 1967.

GUADALUPE-SAN ANTONIO RIVER BASINS

1. Daily records available:

Guadalupe River near Spring Branch	January to December 1942, December 1943 - August 1945
Guadalupe River at Victoria	October 1945 -
San Antonio River at Goliad	September 1945 - September 1946, September 1958 -

2. Reconnaissance sampling, 1962 fiscal year:

<u>Reservoirs</u>	<u>Sampling sites</u>	<u>Number of samples</u>
Cloptin Crossing	Blanco River at Wimberly	3
Lockhart	Plum Creek at Lockhart	3
--	Peach Creek below Dilworth	3
Cuero II	Sanders Creek near Westhoff	3
Confluence	Coleto Creek near Schroeder	3
Cibolo	Cibolo Creek near Falls City	6
Ecletto	Ecletto Creek near Runge	10

3. Future sampling and report schedule:

Reconnaissance sampling will continue at about the same level from 1963 to 1965. Intensive sampling in 1966 will be followed by a report in 1967.

NUECES RIVER BASIN

1. Daily records available:

Nueces River at Cotulla	January to December 1942
Nueces River at Tilden	December 1949 - September 1950
Nueces River near Three Rivers	September 1945 - September 1946, September 1950 - September 1952
Nueces River near Mathis	October 1947 -

2. Reconnaissance sampling, 1962 fiscal year:

<u>Reservoirs</u>	<u>Sampling sites</u>	<u>Number of samples</u>
Crystal City	Nueces River near Asherton	3
Caimanche	Turkey Creek near Crystal City	3
Cotulla	Nueces River at Cotulla	3
Fowlerton	Frio River near Derby	3
Choke Canyon	Frio River at Calliham	3

3. Future sampling and report schedule:

Reconnaissance sampling will be continued through 1966 and a report prepared in 1967.

RIO GRANDE BASIN

1. Daily records available:

*Rio Grande near El Paso	1933 -
*Rio Grande below Old Fort Quitman	1933 -
*Rio Grande at Upper Presidio	1935 -
*Rio Grande near Johnson Ranch	1948 -
*Rio Grande at Langtry	1944 -
Salt (Screwbean) Draw near Orla	October 1943 - September 1944, October 1946 - September 1947
Pecos River near Orla	July 1937 -
Pecos River at Pecos	April 1939 - June 1941
Toyah Creek near Pecos	September 1939 - September 1940, October 1943 - September 1944
Salt Draw near Pecos	October 1939 - September 1940, October 1943 - September 1944
Toyah Creek below Toyah Lake near Pecos	September 1939 - October 1940, October 1943 - September 1944, October 1946 - September 1950
Pecos River near Barstow	September 1939 - March 1941
Pecos River below Grandfalls	April 1939 - June 1942, October 1946 - September 1956
Pecos River near Girvin	October 1939 - June 1941, October 1946 - September 1947, October 1953 -
Pecos River near Sheffield	November 1939 - June 1941, October 1946 - September 1947
*Pecos River near Shumla	October 1954 -
*Rio Grande at Laredo	July 1955 -
*Rio Grande below Falcon Dam	July 1955 -
Rio Grande at Roma	October 1942 - May 1943
*Rio Grande at Fort Ringgold, Rio Grande City	January 1959 -
Rio Grande at Mission Pumping Plant near Mission	July 1945 - September 1950
*Rio Grande at Anzalduas Dam	March 1959 -
Rio Grande near San Benito	November 1942 - June 1943
Rio Grande at Los Fresnos Pumping Plant near Brownsville	July 1945 - June 1946
Rio Grande near Brownsville	March 1943 - February 1944

\* Analyses by the U. S. Department of Agriculture, published in Water Bulletins of the International Boundary and Water Commission.

2. Reconnaissance sampling, 1962 fiscal year:

None.

3. Future sampling and report schedule:

No reconnaissance sampling has been scheduled from 1962 through 1964. The main stem of the Rio Grande is being studied by the International Boundary and Water Commission. It will be decided later whether the reconnaissance project will be extended to cover the Rio Grande Basin. A report could be scheduled for 1968.

COASTAL AREAS

1. Daily records available:

Mission River at Refugio

September 1961 -

2. Reconnaissance sampling, 1962 fiscal year:

<u>Reservoirs</u>	<u>Sampling sites</u>	<u>Number of samples</u>
<u>Guadalupe-Nueces Coastal Area</u>		
Beeville	Medio Creek near Beeville	6
Blanco	Blanco Creek at State Highway 202 near Refugio	6
Woodboro	Aransas River near Skidmore	6
<u>Nueces-Rio Grande Coastal Area</u>		
Alice	San Fernando Creek near Alice	6
Kingsville	San Fernando Creek at Kingsville	6
Kingsville	Santa Gertrudis Creek near Kingsville	6
Kingsville	Escondido Creek near Kingsville	6

3. Future sampling, and report schedule:

Reconnaissance sampling will be decreased slightly for 1963 and 1964, but will be increased in 1966 and 1967, and a report prepared in 1968.