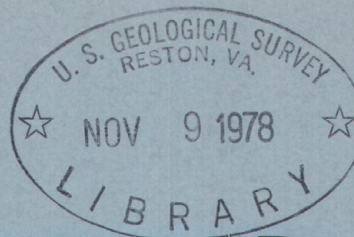


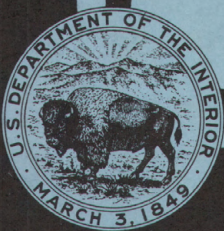
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# Water Resources Data for Texas

## Water Year 1977

Volume 3. Colorado River Basin, Lavaca River Basin,  
Guadalupe River Basin, Nueces River Basin,  
Rio Grande Basin and  
Intervening Coastal Basins



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT TX-77-3

Prepared in cooperation with the State of Texas  
and with other agencies



# CALENDAR FOR WATER YEAR 1977

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# **Water Resources Data for Texas Water Year 1977**

Volume 3. Colorado River Basin, Lavaca River Basin,  
Guadalupe River Basin, Nueces River Basin,  
Rio Grande Basin and  
Intervening Coastal Basins



**U.S. GEOLOGICAL SURVEY WATER-DATA REPORT TX-77-3**

**Prepared in cooperation with the State of Texas  
and with other agencies**



UNITED STATES DEPARTMENT OF THE INTERIOR

CECIL D. ANDRUS, Secretary

GEOLOGICAL SURVEY

H. W. Menard, Director

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Austin, Texas 78701



## Preface

This report was prepared by the U.S. Geological Survey in cooperation with the State of Texas and with other agencies by personnel of the Texas district of the Water Resources Division under the supervision of I. D. Yost, District Chief, and Alfred Clebsch, Jr., Regional Hydrologist, Central Region.

This report is one of a series issued by State under the general direction of J. S. Cragwall, Jr., Chief Hydrologist, and G. W. Whetstone, Assistant Chief Hydrologist for Scientific Publications and Data Management.

Data for Texas are in three volumes as follows:

- Volume 1. Arkansas River basin, Red River basin, Sabine River basin, Neches River basin, Trinity River basin, and intervening Coastal basins
- Volume 2. San Jacinto River basin, Brazos River basin, San Bernard River basin, and intervening Coastal basins
- Volume 3. Colorado River basin, Lavaca River basin, Guadalupe River basin, Neches River basin, Rio Grande basin, and intervening Coastal basins



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7. Author(s)		6.	
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		14.	
15. Supplementary Notes Prepared in cooperation with the State of Texas and with other agencies.			
16. Abstracts Surface-water data for the 1977 water year for Texas are presented in three volumes, appropriately identified as to content by river basins. Data in each volume consist of records of stage, discharge, and water quality of streams and canals; and stage, contents, and water quality of lakes and reservoirs. Also included are crest-stage and flood-hydrograph partial-record stations, reconnaissance partial-record stations, and low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements. Records for a few pertinent stations in bordering States are also included. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in Texas.			
17. Key Words and Document Analysis. 17a. Descriptors *Texas, *Hydrologic data, *Surface water, *Water Quality, Flow rate, Gaging stations, Lakes, Reservoirs, Chemical analyses, Sediments, Water temperatures, Sampling sites, Water analyses			
17b. Identifiers/Open-Ended Terms			
17c. COSATI Field/Group			
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# WATER RESOURCES DATA FOR TEXAS, 1977

## VOLUME 3

### COLORADO RIVER BASIN, LAVACA RIVER BASIN, GUADALUPE RIVER BASIN, NECHES RIVER BASIN, RIO GRANDE BASIN, AND INTERVENING COASTAL BASINS

## INTRODUCTION

Surface-water data for Texas for the 1977 water year are presented in three volumes, appropriately identified by river basins. Data in each volume consist of records of stage, discharge, and water quality of streams and canals; and stage, contents, and water quality of lakes and reservoirs. Records for a few pertinent stations in bordering states are also included. These data represent that part of the National Water Data System operated by the U.S. Geological Survey in cooperation with State and Federal agencies in Texas.

Records of discharge (or stage) of streams and contents (or stage) of lakes and reservoirs were first published in a series of Geological Survey Water-Supply Papers entitled, "Surface Water Supply of the United States." Through water year 1960, these water-supply papers were in an annual series and then in a 5-year series for 1961-65 and 1966-70. Records of chemical quality, water temperature, and suspended sediment were published from 1941 to 1971 in an annual series of water-supply papers entitled, "Quality of Surface Waters of the United States." Water-supply papers may be consulted in the libraries of the principal cities in the United States or may be purchased from Branch of Distribution, U.S. Geological Survey, 604 South Pickett Street, Alexandria, Va. 22161.

For water years 1961 through 1974, streamflow data were released by the Geological Survey in annual reports on a State-boundary basis. Water-quality records for water years 1964 through 1974 were similarly released either in separate reports or in conjunction with streamflow records. Beginning with the 1975 water year, water data for streamflow and water quality are published as an official Survey report on a State-boundary basis. These official Survey reports carry an identification number consisting of the two letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report TX-77-1." Water-Data reports are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161.

## COOPERATION

Organizations that assisted in the collection of data in this report through cooperative agreements with the Geological Survey in 1977 are:

Texas Department of Water Resources, J. M. Rose, Executive Director; A. L. Black, Chairman; R. B. Gilmore, Vice-Chairman; M. T. Potts, G. E. Roney, J. H. Garrett, and G. W. McCleskey, Members.

Texas Department of Highways and Public Transportation, B. L. DeBerry, Engineer-Director.

Pecos River Commission, Horace Babcock, Federal Representative and Chairman; R. B. McGowen, Jr., Commissioner for Texas, and J. L. Cathey, Commissioner for New Mexico.

Sabine River Compact Administration, W. H. Robinson, Federal Representative and Chairman; R. J. Palmer and D. V. Cresap for Louisiana; and J. M. Syler and G. M. Smith for Texas.

City of Austin, C. B. Graves, Jr., Director, Engineering Department.

City of Dallas, Monroe McCorkle, Director, Public Works Department.

City of Garland, F. G. Greene, Director of Public Works.

City of Houston, J. A. Schindewolf, Director, Department of Public Works.

City of Mesquite, G. E. Dowling, City Engineer.

Assistance in the form of funds or services was given by the following Federal agencies:

Corps of Engineers, U.S. Army

International Boundary and Water Commission, Department of State.

Soil Conservation Service, Department of Agriculture.

Assistance in the form of funds or services was rendered by the following organizations through the Texas Department of Water Resources:

The cities of Abilene, Alice, Arlington, Austin, Brady, Cleburne, Clyde, Corpus Christi, Dallas, El Paso, Gainesville, Graham, Houston, Nacogdoches, San Angelo, and Wichita Falls; Athens Municipal Water Authority; Bexar, Medina, and Atascosa Counties Water Control and Improvement District No. 1; Bistone Municipal Water Supply District; Brazos River Authority; Chocolate Bayou Land and Water Company; Colorado River Municipal Water District; Dallas County; Dallas Power and Light Company; Dow Chemical Company; Edwards Underground Water District; Franklin County Water District; Freese and Nichols, Inc.; Greenbelt Municipal and Industrial Water Authority; Guadalupe-Blanco River Authority; Harris County Flood Control District; Houston Lighting and Power Company; Lone Star Steel Company; Lower Colorado River Authority; Lower Neches Valley Authority; MacKenzie Municipal Water Authority; North Central Texas Municipal Water Authority; Northeast Texas Municipal Water District; Palo Pinto County Municipal Water District; Red Bluff Water Power Control District; Reeves County Water Improvement District No. 1; Richmond Rice Association; Sabine River Authority of Texas; San Antonio City Public Service Board; San Antonio City Water Board; San Antonio River Authority; San Jacinto River Authority; Tarrant County Water Control and Improvement District No. 1; Texas Electric Service Company; Texas Utilities Services, Inc.; Titus County Fresh Water Supply District No. 1; Tom Green County Water Control and Improvement District No. 1; Trinity River Authority; Upper Guadalupe River Authority; Upper Neches River Municipal Water Authority; West Central Texas Municipal Water District; Upper Trinity Basin Water Quality Compact; Wichita County Water Improvement District No. 2; and Wood County.

### HYDROLOGIC CONDITIONS

Large variations in rainfall and runoff characterize the usual hydrologic conditions in Texas. In the east, streams are usually deep with wide alluvial flood plains, and streamflow is generally perennial. Normal annual rainfall exceeds 50 inches in the extreme east and annual runoff may average as much as 15 inches. In the west, streams are generally of the arroyo type and streamflow is highly ephemeral. Normal annual rainfall is less than 8 inches in the extreme west and annual runoff averages less than 0.1 inch in many areas.

During the 1977 water year, annual runoff over the State slightly increased in the southern part and was near normal in all other parts. Figure 1 on page 25 shows a comparison of monthly and annual mean discharges for four index stations in different parts of the State. Conservation storage in a selected group of 63 reservoirs, with a combined



conservation capacity of 30,250,000 acre-feet, continued to decrease from 86 percent of capacity in September 1976 to 81 percent at the end of September 1977.

At the beginning of the 1977 water year, streamflow was in the median range, except in the Panhandle where it was deficient. In November the streamflow was excessive in most of south Texas and parts of west Texas with the rest of the State near normal. Streamflow in December, January, and February changed little from that in November. However, during March streamflow in most of the State returned to near normal.

April brought a return of excessive streamflow to south Texas, but the Panhandle experienced deficient streamflow. This trend was broken in May when above-average rainfall in the Panhandle caused excessive streamflows.

Hot weather and a lack of rainfall during June caused deficient streamflow in east Texas. This trend of hot and dry weather continued into August and September. The water year ended with deficient streamflow across the Panhandle and north Texas and near normal runoff in the remainder of the State.

#### DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also the table for converting English units to International System of units (SI) on the inside of the back cover.

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet, about 326,000 gallons, or 1,233 cubic meters.

Algae are mostly aquatic, single-celled, colonial, or multi-celled plants, containing chlorophyll and lacking roots, stems, and leaves.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C. In the laboratory these bacteria are defined as the organisms which produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35°C  $\pm$  1.0°C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestines or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms which produce blue colonies within 24 hours when incubated at 44.5°C  $\pm$  0.2°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found in intestines of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C  $\pm$  1.0°C on M-enterococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Bed material is the unconsolidated material of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria.

Biomass is the amount of living matter present at any given time, expressed as the mass per unit area or volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500°C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in g/m<sup>3</sup> (grams per cubic meter), and periphyton and benthic organisms in g/m<sup>2</sup> (grams per square meter).

Dry mass refers to the mass of residue present after drying in an oven at 60°C for zooplankton and 105°C for periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and ash mass, and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash mass and dry mass.

Wet mass is the mass of living matter plus contained water.

Biomass pigment ratio is the ratio of organic mass in  $\text{mg/m}^2$  (milligrams per square meter) to the mass of chlorophyll a, in  $\text{mg/m}^2$ .

Bottom material: See Bed material.

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually mL (milliliters) or L (liters).

Cfs-day is the volume of water represented by flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-ft, about 646,000 gallons or 2,447 cubic meters.

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water, and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with natural water color or with carbonaceous organic pollution from sewage or industrial wastes.

Chlorophyll refers to the green pigments of plants. Chlorophyll a and b are the two most common pigments in plants.

Color unit is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

Coliform organisms is a group of bacteria used as an indicator of the sanitary quality of water. The number of coliform colonies per 100 mL of sample was determined by the immediate-incubation membrane-filter method.

Contents is the volume of water in a reservoir or lake, and unless otherwise indicated is computed on the basis of a level pool. The computation does not include bank storage.

Control designates a feature downstream from a gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.



Cubic foot per second per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Cubic foot per second (FT<sup>3</sup>/S, ft<sup>3</sup>/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second. This rate is equivalent to approximately 7.48 gallons per second, 448.8 gallons per minute, or 0.02832 cubic meters per second.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment), that passes a given point within a given period of time.

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specified period.

Instantaneous discharge is the discharge at a particular instant of time.

Dissolved refers to the amount of substance present in true chemical solution. In practice, however, the term includes all forms of substance that will pass through a 0.45-micrometer membrane filter, and thus may include some very small (colloidal) suspended particles. Analyses are performed on filtered samples.

Diversity index is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

$$\bar{d} = - \sum_{i=1}^s \frac{n_i}{n} \log_2 \frac{n_i}{n}$$

Where  $n_i$  is the number of individuals per taxon,  $n$  is the total number of individuals, and  $s$  is the total number of taxa in the sample of the community. Diversity index values range from zero, when all the organisms in the sample are the same, to some positive number, when some or all of the organisms in the sample are different.

Drainage area of a stream at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified location. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Gage height (G.HT.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate ( $\text{CaCO}_3$ ).

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an 8-digit number.

Methylene blue active substance (MBAS) is a measure of apparent detergents. This determination depends on the formation of a blue color when methylene blue dye reacts with synthetic-detergent compounds.

Micrograms per gram ( $\mu\text{g/g}$ ) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (gram) of sediment.

Micrograms per liter ( $\text{UG/L}$ ,  $\mu\text{g/L}$ ) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter ( $\text{MG/L}$ ,  $\text{mg/L}$ ) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represent the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in  $\text{mg/L}$ , and is based on the mass of sediment per liter of water-sediment mixture.

ND is used in some of the tables of pesticide data as an abbreviation for "Not Detected." Analyses in which this term is reported were made by the U.S. Environmental Protection Agency laboratory in Bay Saint Louis, Mississippi.

Organism is any living entity, such as an insect, phytoplankter, or zooplankter.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meters ( $m^2$ ), acres, or hectares. Periphyton benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliters (mL) or liters (L). Numbers of planktonic organisms can be expressed in these terms.

Total organism count is the total number of organisms collected and enumerated in any particular sample.

Partial-record station is a particular site where limited streamflow and/or water-quality data are collected systematically over a period of years for use in hydrologic analyses.

Particle size is the diameter, in millimeters (mm), of suspended sediment or bed material determined either by sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification used in this report agrees with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

<u>Classification</u>	<u>Size (mm)</u>	<u>Method of analysis</u>
Clay.....	0.00024 - 0.004	Sedimentation
Silt.....	.004 - .062	Do.
Sand.....	.062 - 2.0	Sedimentation or sieve
Gravel.....	2.0 - 64.0	Sieve

The particle-size distribution given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic material is removed and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native-water analysis.

Percent composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, mass, or volume.

Periphyton is the assemblage of microorganisms attached to and growing upon solid surfaces. While primarily consisting of algae, the assemblage may include bacteria, fungi, protozoa, rotifers, and other small organisms.



Pesticides are chemical compounds used to control undesirable plants and animals. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides. Insecticides and herbicides, which control insects and plants respectively, are the two categories reported.

Picocurie (PC, pCi) is one trillionth ( $1 \times 10^{12}$ ) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields  $3.7 \times 10^{10}$  radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton is the plant part of the plankton. They are usually microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment, and are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells/mL of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algal mats of floating "moss" in lakes. Their concentrations are expressed as number of cells/mL of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column, and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.

Polychlorinated biphenyls (PCBs) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

Runoff in inches (IN, in) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material, such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Suspended-sediment discharge (tons/day) is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight or volume, that passes a section in a given time. It is computed by multiplying discharge ( $\text{ft}^3/\text{s}$ ) times mg/L times 0.0027.

Suspended-sediment load is quantity of suspended sediment passing a section in a specified period.

Total sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bed-load discharge. It is the total quantity of sediment, as measured by dry weight or volume, that passes a section during a given time.

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Sodium adsorption ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions with soil and is an index of sodium or alkali hazard to the soil. This ratio should be known especially for water used for irrigation.

Solute is any substance derived from the atmosphere, vegetation, soil, or rocks that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in micromhos per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content in the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in micromhos). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stage-discharge relation is the relation between gage height (stage) and volume of water per unit of time, flowing in a channel.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Substrate is the physical surface upon which an organism lived.

Natural substrates refers to any naturally occurring emersed or submersed solid surface, such as a rock or tree, upon which an organism lived.

Artificial substrate is a device which is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multi-plate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of the total concentration in a water-sediment mixture. The water-sediment mixture is associated with (or sorbed on) that material retained on a 0.45 micrometer filter.

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration in milligrams per liter by 0.00136.

Tons per day is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour day.

Total (as used in tables of chemical analyses) refers to the amount of substance present both in solution and suspension.

Total load (tons) is the total quantity of any individual constituent, as measured by dry mass or volume, that is dissolved in a specific amount of water (discharge) during a given time. It is computed by multiplying the mean discharge ( $\text{ft}^3/\text{s}$ ), times the  $\text{mg/L}$  of the constituent, times the factor 0.0027, times the number of days.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchical scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, Hexagenia limbata is the following:

Kingdom.....Animal  
Phylum.....Arthropoda  
Class.....Insecta  
Order.....Ephemeroptera  
Family.....Ephemeridae  
Genus.....Hexagenia  
Species.....Hexagenia limbata

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual basic-data reports.

WRD is used as an abbreviation for "Water Resources Data" in the REVISED RECORDS paragraph to refer to State annual basic-data reports published before 1975.

WSP is used as an abbreviation for "Water-Supply Paper" in references to previously published reports.

#### DOWNSTREAM ORDER AND STATION NUMBER

Since October 1, 1950, the order of listing hydrologic-station records in Survey reports is in a downstream direction along the main



stream. All stations on a tributary entering upstream from a main-stream station are listed before that station. A station on a tributary that enters between two main-stream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary on which a station is situated with respect to the stream to which it is immediately tributary is indicated by an indentation in a list of stations in the front of the report. Each indentation represents one rank. This downstream order and system of indentation show which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

As an added means of identification, each hydrologic station and partial-record station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The station numbering system is not used at miscellaneous sites where only random water-quality samples or discharge measurements are taken. The complete number for each station consists of eight digits, such as 08123800. The first two digits, 08 or 07, identify the river basin as previously published in the series of water-supply papers on the Surface Water Supply of the United States. The digits 07 indicate the Lower Mississippi River basin, and the digits 08 indicate the Western Gulf of Mexico basins. The remaining six digits of the station number are sequential in downstream order.

All records for a drainage basin that extends across State boundaries can be arranged in downstream order by assembling the pages from the appropriate State reports by station number.

#### SPECIAL NETWORKS AND PROGRAMS

Hydrologic bench-mark station is one that provides hydrologic data for a basin in which the hydrologic regimen will likely be governed solely by natural conditions. Data collected at a bench-mark station may be used to separate effects of natural from manmade changes in other basins that have been developed and in which the physiography, climate, and geology are similar to those in the undeveloped bench-mark basin.

National stream-quality accounting network (NASQAN) is a data collection network designed by the Geological Survey to meet many of the information demands of agencies or groups involved in national or regional water-quality planning and management. Both accounting and broad-scale monitoring objectives have been incorporated into the network design. Areal configuration of the network is based on river-basin accounting units (identified by 8-digit hydrologic-unit numbers) designated

by the Office of Water Data Coordination in consultation with the Water Resources Council. Primary objectives of the network are (1) to depict areal variability of streamflow and water-quality conditions nationwide on a year-by-year basis and (2) to detect and assess long-term changes in streamflow and stream quality.

Pesticide program is a network of regularly sampled water-quality stations where samples are collected to determine the concentration and distribution of pesticides in streams where potential contamination could result from the application of the commonly used insecticides and herbicides. Operation of the network is a Federal interagency activity.

Radiochemical program is a network of regularly sampled gaging stations where additional samples are collected monthly or twice a year (at high and low flow) to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

## EXPLANATION OF STAGE AND WATER-DISCHARGE RECORDS

### Collection and computation of data

The basic data collected at gaging stations consist of (1) records of stage; (2) measurements of discharge of streams and canals; and (3) stage, surface area, and contents of lakes and reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement basic data in determining the daily flow or volume of water in storage. Records of stage are obtained from direct readings on a non-recording gage or from a water-stage recorder that gives either a continuous graph of the fluctuations or a tape punched at 5-, 15-, 30-, or 60-minute intervals. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in standard textbooks, in Water-Supply Paper 888, and in U.S. Geological Survey Techniques of Water Resources Investigations, book 3, chapter A6. Surface areas of lakes or reservoirs are determined from instrument surveys using standard methods. The configuration of the reservoir bottom is often determined by sounding at many points.

For stream-gaging stations, rating tables giving the discharge for any stage are prepared from stage-discharge relation curves. If extensions to the rating curves are necessary to express discharge greater than measured, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, computation of flow over dams or weirs), step-backwater techniques,

velocity-area studies, and logarithmic plotting. The daily mean discharge is computed from gage heights and rating tables; monthly and yearly mean discharges are computed from the daily values. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is computed by the shifting-control method, in which correction factors (based on individual discharge measurements and notes by the hydrologists or observers) are used in applying the gage heights to the rating tables.

At some stream-gaging stations, the stage-discharge relation is affected by backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations, the stage-discharge relation is affected by changing stage; at these stations, the rate of change in stage is used as a factor in computing discharge.

For a lake- or reservoir-gaging station, a capacity table giving the contents for any stage is prepared from a stage-area relation curve defined by surveys. The application of the stage to the capacity table gives the contents, from which the daily, monthly, or yearly changes in contents are computed.

If the stage-capacity curve is subject to changes because of deposition of sediment in the reservoir, periodic resurveys of the reservoir are necessary to define new stage-capacity curves. During the period between reservoir surveys, the computed contents may be increasingly in error due to the gradual accumulation of sediment.

At some gaging stations, there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated on the basis of recorded range in stage, adjoining good record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Daily contents may be estimated on the basis of operator's log, adjoining good record, inflow-outflow studies, and other information.

The data in this report generally comprise a description of the station and tabulations of daily and monthly values. For gaging stations on streams or canals, a table showing the daily, monthly, and yearly discharge is given. For a gaging station on a reservoir, a table showing the daily contents is given. Tables of daily or maximum and minimum daily gage heights are included for some gaging stations. Records are published for the water year, which begins on October 1 and ends on September 30.

A calendar for the current water year is shown on the inside of the front cover to facilitate finding the day of the week for any date.

The description of the gaging stations, except those partial-record stations published in tabular form in the back of the report, gives the location, drainage area, period of record, type and history of gages, average discharge, extremes of discharge or contents, general remarks, and notations of revisions of previously published records. The location of the gaging stations and the drainage areas are obtained from the most accurate maps available. River mileage, given under "LOCATION" for some stations, is that determined and used by the Corps of Engineers or other agencies (U.S. Water Resources Council, 1968). Periods for which there are published records for the present station or for stations generally equivalent to the present one are given under "PERIOD OF RECORD."

Previously published streamflow records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the annual or compilation reports. In order to make it easier to find such revised records, a paragraph headed "REVISED RECORDS" has been added to the description of all stations for which revised records have been published. Listed therein are all the reports in which revisions have been published, each followed by the water years for which figures are revised in that report. In listing the water years only one number is given; for instance, 1965 stands for the water year October 1, 1964, to September 30, 1965. If no daily, monthly, or annual figures of discharge are affected by the revision, the fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the revised figure was first published is given. It should be noted that for all stations for which cubic feet per second per square mile and runoff in inches are published, a revision of the drainage area necessitates corresponding revision of all figures based on the drainage area. Revised figures of cubic feet per second per square mile and runoff in inches resulting from a revision of the drainage area only are usually not published in the annual series of reports.

The type of gage currently in use, the datum of the present gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of record are given under "GAGE." In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the Topographic Division of the Geological Survey unless otherwise qualified.



Information pertaining to the accuracy of the discharge records and to conditions which affect the natural flow of the gaging station is given under "REMARKS." For reservoir stations information on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir is given under "REMARKS."

The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE"; it is not given for stations having fewer than 5 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "EXTREMES" are given first, the extremes for the period of record, second, information available outside the period of record, and last, those for the current year. Unless otherwise qualified, the maximum discharge (or contents) is the instantaneous maximum corresponding to the crest stage obtained by use of a water-stage recorder (graphic or digital), a crest-stage gage, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur on the same day as the maximum discharge (or contents), it is given separately. Similarly, the minimum is the instantaneous minimum unless otherwise qualified. For some stations peak discharges are listed with EXTREMES FOR THE CURRENT YEAR; if they are, all independent peaks, including the maximum for the year, above the selected base with the time of occurrence and corresponding gage heights are published in tabular format. The base discharge, which is given in the table heading, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimums for these stations are published in a separate paragraph following the table of peaks.

The daily table for stream-gaging stations gives the mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also may be expressed in cubic feet per second per square mile (line headed "CFSM"), or in inches (line headed "IN"), or in acre-feet (line headed "AC-FT"). Figures for cubic feet per second per square mile and runoff in inches are generally omitted if there is extensive regulation or diversion, if the drainage area includes large noncontributing areas, or if the average annual rainfall over the drainage basin is usually less than 20 inches. In the yearly summary below the monthly summary, the figures shown are the appropriate daily discharges for the calendar and water years.

Footnotes to the table of daily discharge are introduced by the word "NOTE." Footnotes are used to indicate periods for which the discharge is computed or estimated by special methods because of no gage-height record, backwater from various sources, or other unusual conditions. Periods of no gage-height record are indicated if the period is continuous for a month or more or includes the maximum discharge for the year. Periods of backwater from an unusual sources, of indefinite stage-relation, or of any other unusual condition at the gage site are indicated only if they are a month or more in length and the accuracy of the records is affected. Days on which the stage-discharge relation is affected by ice are not indicated. The methods used in computing discharge for various unusual conditions have been explained in preceding paragraphs.

Data collected at partial-record stations follow the information for continuous record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual, maximum stage and discharge at crest-stage stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. Occasionally, a series of discharge measurements are made and samples collected within a short time period to investigate the seepage and (or) pollutant gains or losses along a reach of a stream or to determine the low-flow characteristics of an area. Such measurements and analyses are also given in special tables following the tables of partial-record stations.

#### Accuracy of field data and computed results

The accuracy of discharge data depends primarily on (1) the stability of the stage-discharge relation, or if the control is unstable, the frequency of discharge measurements; and (2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

The station description under "REMARKS" states the degree of accuracy of the records. "Excellent" means that about 95 percent of the daily discharges are within 5 percent; "good", within 10 percent; and "fair" within 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Figures of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 cfs; to tenths between 1.0 and 10 cfs; to whole numbers between 10 and 1,000 cfs; and to 3 significant figures above 1,000 cfs. The number of significant figures used is based solely on the magnitude of the figure. The same rounding rules apply to discharge figures listed for partial-record stations.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such station, figures of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

#### Other data available

Information of a more detailed nature than that published for most of the gaging stations, such as observations of water temperatures, discharge measurements, gage-height records, and rating tables, is on file in the Texas District Office in Austin. Most gaging-station records are available in computer-usable form, and many statistical analyses have been made.

#### Records of discharge collected by agencies other than the Geological Survey

The International Boundary and Water Commission, United States and Mexico, operates all streamflow stations on the Rio Grande and near the mouth of its principal tributaries at and below El Paso, Texas. Records collected at these stations are published in annual bulletins by the Commission and may be obtained from the International Boundary and Water Commission, United States Section, P. O. Box 20003, El Paso, Texas 79998.

### EXPLANATION OF SURFACE-WATER QUALITY RECORDS

#### Collection and examination of data

Surface-water samples for analyses usually are collected at or near gaging stations. The quality-of-water records are given immediately following the discharge records at these stations.

The descriptive heading for water-quality records gives the period of record for all water-quality data; the period of daily record for parameters that are measured on a daily basis (specific conductance, pH, dissolved oxygen, water temperature, sediment discharge, etc.); extremes for the period of daily record; extremes for the current year; and general remarks.

### Water analysis

Most methods for collecting and analyzing water samples are described in U.S. Geological Survey Techniques of Water Resources Investigations listed on a following page.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed determination of for an accurate mean concentration and for use in calculating loads.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between the reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is probably the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

At stream-gaging stations where daily samples are obtained, tables are included to show monthly and annual means of specific conductance; concentrations of dissolved solids, chloride, sulfate, hardness; and loads of dissolved solids, chloride, and sulfate. The means have been computed by using the daily records of specific conductance and developing regression relationships between each water-quality parameter and specific conductance.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the district office.

### Water temperature

Water temperatures are measured at most of the water-quality stations. Water temperatures are also taken at time of discharge measurements at gaging stations. At sites at which daily samples are taken, the water temperature is taken about the same time each day. Large streams



have a small diurnal temperature change; but small, shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams and reservoirs may be affected by waste-heat discharges.

At stations where continuously recording thermographs are present, the records published consist of maximum and minimum temperatures for each day and the monthly averages.

### Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section, or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross section.

During periods of rapidly changing flow or rapidly changing concentration, samples may have been collected twice daily or, in some instances, hourly. The published values of sediment discharges for days of rapidly changing flow or concentrations were computed by the subdivided-day method (time-discharge weighted average). Therefore, for those days in which the published value of sediment discharge differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water-sediment discharge relations, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples were collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow and in estimating long-term sediment-discharge characteristics of the stream.

In addition to the records of the quantities of suspended sediment, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included.

## PUBLICATIONS OF TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

Most methods used by the U.S. Geological Survey have been published in the series on techniques describing procedures for planning and executing specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (applications of Hydraulics) is on surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises. The reports listed below are for sale by the U.S. Geological Survey, Branch of Distribution, 604 South Picket Street, Alexandria, VA 22304 (authorized agent of the Superintendent of Documents, Government Printing Office).

NOTE: When ordering any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations".

- 1-D1. *Water temperature-influential factors, field measurement, and data presentation*, by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1976. 65 p. \$1.60.
- 3-A1. *General field and office procedures for indirect discharge measurements*, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 p. \$1.00.
- 3-A2. *Measurement of peak discharge by the slope-area methods*, by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 p. \$0.35.
- 3-A3. *Measurement of peak discharge at culverts by indirect methods*, by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968, 60 p. \$0.40.
- 3-A4. *Measurement of peak discharge at width contractions by indirect methods*, by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 p. \$1.00.
- 3-A5. *Measurement of peak discharge at dams by indirect methods*, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 p. \$0.35.
- 3-A6. *General procedure for gaging streams*, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6, 1968. 13 p. \$1.00.
- 3-A7. *Stage measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 p. \$1.40.
- 3-A8. *Discharge measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 p. \$1.25.
- 3-A11. *Measurement of discharge by moving-boat method*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 p. \$1.20.
- 3-A12. *Fluorometric procedures for dye tracing*, by J. F. Wilson Jr.: USGS--TWRI Book 3, Chapter A12. 1968. 31 p. \$0.35. Not currently available.
- 3-C1. *Fluvial sediment concepts*, by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 p. \$0.65.
- 3-C2. *Field methods for measurement of fluvial sediment*, by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 p. \$2.50.

- 3-C3. *Computation of fluvial-sediment discharge*, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 p. \$2.10.
- 4-A1. *Some statistical tools in hydrology*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 p. \$1.60.
- 4-A2. *Frequency curves*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 p. \$0.35.
- 4-B1. *Low-flow investigations*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 p. \$0.65.
- 4-B2. *Storage analyses for water supply*, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 p. \$0.75.
- 4-B3. *Regional analyses of streamflow characteristics*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 p. \$0.65.
- 5-A1. *Methods for collection and analysis of water samples for dissolved minerals and gases*, by Eugene Brown, M. W. Skougstad, and M. J. Fishman: USGS--TWRI Book 5, Chapter A1. 1970. 160 p. \$2.40.
- 5-A2. *Determination of minor elements in water by emission spectroscopy*, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 p. \$0.80.
- 5-A3. *Methods for analysis of organic substances in water*, by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 p. \$0.90.
- 5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples*, edited by P. E. Greeson, T. A. Ehlke, G. A. Irwin, B. W. Lium, and K. V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. Revised edition. 332 p. \$20.00.
- 5-A5. *Methods for determination of radioactive substances in water and fluvial sediments*, by L. L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 p. \$16.00.
- 5-C1. *Laboratory theory and methods for sediment analysis*, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 p. \$2.10.
- 8-B2. *Calibration and maintenance of vertical-axis type current meters*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 p. \$1.10.

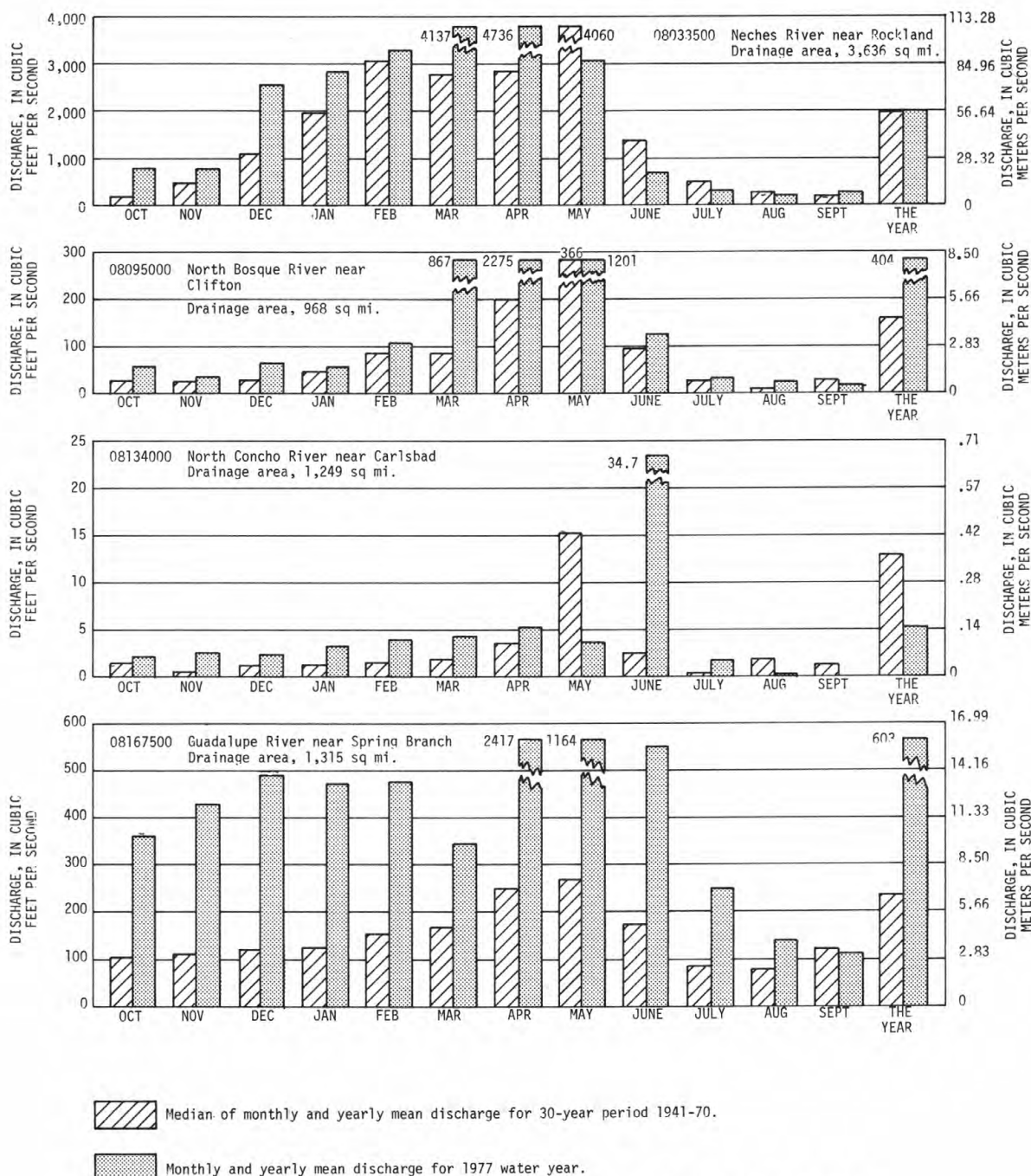


FIGURE 1.--COMPARISON OF DISCHARGE AT FOUR LONG-TERM REPRESENTATIVE GAGING STATIONS DURING THE 1977 WATER YEAR WITH MEDIAN DISCHARGE FOR THE PERIOD 1941-70





## 08118000 LAKE J. B. THOMAS NEAR VINCENT, TX

LOCATION.--Lat 32°35'09", long 101°12'18", Borden County, Hydrologic Unit 12080002, at Big Spring pump station on south side of lake, 4.0 mi (6.4 km) upstream from dam on Colorado River, 7.3 mi (11.7 km) north of Vincent, 12.5 mi (20.1 km) west of Ira, and at mile 841.0 (1,353.2 km).

DRAINAGE AREA.--3,524 mi<sup>2</sup> (9,127 km<sup>2</sup>), of which 2,590 mi<sup>2</sup> (6,710 km<sup>2</sup>) probably is noncontributing. Drainage area includes 426 mi<sup>2</sup> (1,103 km<sup>2</sup>) above Bull Creek diversion dam, of which 32 mi<sup>2</sup> (83 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1953 to current year.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Nov. 4, 1953, to Feb. 7, 1955, Colorado River Municipal Water District nonrecording gage located 4.0 mi (6.4 km) downstream at same datum.

REMARKS.--The lake is formed by a rolled earthfill dam, 14,500 ft (4,420 m) long. Storage began in July 1952 and the dam was completed in September 1952. There was no appreciable storage prior to July 1953. Capacity curve is based on surveys made in 1948 and 1950. There are two emergency spillways, both cut through natural ground and located as follows: The first is 500 ft (150 m) wide located at the left end of dam and the second is 1,600 ft (488 m) wide located at the right end of dam. These spillways are designed to discharge 161,000 ft<sup>3</sup>/s (4,560 m<sup>3</sup>/s) at an elevation of 2,275.0 ft (693.42 m). An uncontrolled rectangular concrete drop inlet, 38.0 by 53.0 ft (11.6 by 16.2 m) at the crest, discharges into two 10.0-foot (3.0-meter) concrete conduits. In addition, there is an outlet that can release water through a 24-inch (610-millimeter) gate into a 30-inch (762-millimeter) concrete pipe. The dam was built by the Colorado River Municipal Water District to impound water for municipal and industrial supply for the cities of Big Spring, Odessa, and Snyder. A diversion dam on Bull Creek diverts water through a 13,000-foot-long (3,960 m) gravity canal into Lake J. B. Thomas. These diversions began in November 1953. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	2,280.0	-
Crest of right spillway (south).....	2,267.0	283,600
Crest of left spillway (north).....	2,264.0	255,000
Crest of drop inlet (top of conservation pool).....	2,258.0	203,600
Lowest gated outlet (invert).....	2,200.0	1,300

COOPERATION.--Record of diversions furnished by Colorado River Municipal Water District.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 218,600 acre-ft (270 hm<sup>3</sup>) Sept. 8, 1962, elevation, 2,259.85 ft (688.802 m); minimum since first appreciable storage, 4,960 acre-ft (6.12 hm<sup>3</sup>) May 28, 1971, elevation, 2,206.43 ft (672.520 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 48,260 acre-ft (59.5 hm<sup>3</sup>) Oct. 1, elevation, 2,228.12 ft (679.131 m); minimum, 22,550 acre-ft (27.8 hm<sup>3</sup>) Sept. 30, elevation, 2,218.12 ft (676.083 m).

Capacity table (elevation, in feet, and total contents, in acre-feet)

2,218.0	22,300
2,223.0	33,870
2,229.0	50,990

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48170	46240	43930	41850	40090	38190	35570	34520	32970	30350	27380	25770
2	48110	46180	43880	41790	40030	38000	35460	34420	32890	30280	27260	25690
3	47980	46120	43850	41770	39950	37890	35250	34290	32790	30160	27130	25550
4	48110	46060	43760	41710	39920	37860	35180	34160	32620	30060	26990	25460
5	47950	45940	43730	41600	39810	37700	35070	34160	32460	29960	26850	25350
6	47920	45910	43610	41540	39780	37620	34940	34080	32360	29870	26710	25220
7	47920	45760	43560	41490	39690	37560	34860	33970	32260	29770	26550	25130
8	47860	45700	43500	41430	39610	37510	34780	33900	32110	29670	26420	25020
9	47800	45640	43410	41260	39550	37460	34680	33900	31940	29550	26280	24910
10	47680	45580	43350	41290	39530	37290	34650	34310	31790	29460	26200	24800
11	47620	45490	43270	41210	39530	37160	34440	34840	31710	29360	26090	24690
12	47530	45460	43210	41260	39470	37130	34390	35020	31660	29240	25950	24550
13	47470	45340	43150	41210	39390	37050	34390	35040	31610	29090	25840	24440
14	47410	45310	43120	41150	39330	36940	34630	34910	31510	28950	25730	24310
15	47290	45220	43030	41070	39220	36860	34650	34860	31360	28830	25640	24210
16	47140	45160	42980	41010	39160	36780	34680	34780	31240	28740	25490	24080
17	47050	45070	42920	40930	39110	36590	34840	34680	31070	28630	25370	23950
18	46990	44980	42860	40870	39050	36590	34840	34570	30880	28490	25240	23830
19	46780	44920	42860	40810	38970	36530	34840	34420	30730	28350	25150	23700
20	46690	44860	42720	40760	38890	36400	34840	34240	30730	28210	25060	23570
21	46570	44750	42630	40730	38780	36320	35180	34130	30830	28050	24980	23470
22	46510	44690	42540	40700	38700	36220	35310	34030	31000	28100	24930	23360
23	46450	44600	42510	40650	38590	36140	35230	33870	31120	28510	24860	23250
24	46360	44540	42430	40560	38510	36090	35200	33740	31000	28280	24730	23150
25	46300	44480	42370	40510	38380	36010	35070	33620	31000	28140	24620	23040
26	46240	44480	42310	40480	38350	36190	34990	33540	31120	28030	24510	22940
27	46330	44340	42280	40390	38270	36040	34860	33370	30900	27910	24640	22830
28	46360	44140	42250	40340	38190	36010	34780	33290	30850	27820	25310	22720
29	46390	44080	42190	40250	---	35880	34710	33170	30660	27730	25820	22640
30	46390	44020	42080	40170	---	35830	34630	33120	30520	27610	26000	22550
31	46300	---	42020	40140	---	35700	---	32990	---	27520	25890	---
(+)	2227.47	2226.70	2226.01	2225.34	2224.63	2223.70	2223.29	2222.65	2221.65	2220.38	2219.66	2218.12
(*)	-1960	-2280	-2000	-1880	-1950	-2490	-1070	-1640	-2470	-3000	-1630	-3340
(++)	1800	1690	1750	1590	1510	1800	1950	2080	1930	2090	1950	1990
MAX	48170	46240	43930	41850	40090	38190	35570	35040	32970	30350	27380	25770
MIN	46240	44020	42020	40140	38190	35700	34390	32990	30520	27520	24510	22550

CAL YR 1976 MAX 54950 MIN 28140 \* +5800 ++ 20120  
WTR YR 1977 MAX 48170 MIN 22550 \* -25710 ++ 22130

+ Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

++ Diversions, in acre-feet, for municipal, industrial, and mining uses.

## COLORADO RIVER BASIN

08118000 LAKE J. B. THOMAS NEAR VINCENT, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICRO- MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
DEC 28...	1355	479	8.2	7.0	120	0	35	7.2	52
DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
DEC 28...	2.1	5.4	184	0	45	31	.7	5.9	273





LOCATION.--Lat 32°35'29", long 101°03'02", Scurry County, Hydrologic Unit 12080002, at bridge on Farm Road 1606, 1.8 mi (2.9 km) upstream from mouth and 2.8 mi (4.5 km) west of Ira.

PERIOD OF RECORD.--Periodic discharge measurements: February 1975 to current year. Operated as a daily discharge station October 1947 to September 1965. Periodic water-quality data: March 1964 to June 1967, February 1975 to current year.

[illegible]

## 31

PERIOD OF RECORD.--Periodic discharge measurements and water-quality data: February 1975 to current year.

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

[illegible]

## COLORADO RIVER BASIN

08119500 COLORADO RIVER NEAR IRA, TX

LOCATION.--Lat 32°32'18", long 101°03'12", Scurry County, Hydrologic Unit 12080002, on right bank 530 ft (162 m) downstream from bridge on State Highway 350, 3.8 mi (6.1 km) downstream from Bluff Creek, 4 mi (6 km) upstream from Willow Creek, 4.5 mi (7.2 km) southwest of Ira, and at mile 826.3 (1,329.5 km).

DRAINAGE AREA.--3,617 mi<sup>2</sup> (9,368 km<sup>2</sup>), of which 2,590 mi<sup>2</sup> (6,710 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1947 to September 1952 (monthly records only 1950-52), October 1958 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 2,134.15 ft (650.489 m) above mean sea level. Oct. 1-30, 1947, non-recording gage at site 75 ft (23 m) upstream at same datum.

REMARKS.--Water-discharge records good. Since July 1952, flow has largely been regulated by Lake J. B. Thomas (station 08118000) 11 mi (17.7 km) upstream.

AVERAGE DISCHARGE.--5 years (water years 1948-52) prior to completion of Colorado River Dam, 50.5 ft<sup>3</sup>/s (1.430 m<sup>3</sup>/s), 36,590 acre-ft/yr (45.1 hm<sup>3</sup>/yr); 19 years (water years 1959-77) regulated, 11.0 ft<sup>3</sup>/s (0.312 m<sup>3</sup>/s), 7,970 acre-ft/yr (9.83 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,500 ft<sup>3</sup>/s (581 m<sup>3</sup>/s) July 6, 1948, gage height, 21.35 ft (6.507 m), from rating curve extended above 9,600 ft<sup>3</sup>/s (272 m<sup>3</sup>/s) by slope-conveyance method; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 16, 1913, gage height, 32 ft (9.8 m), was the greatest since at least that date, from information by local resident. Flood in May 1947 reached a stage of 25.1 ft (7.65 m), from floodmark at site of former bridge 269 ft (82 m) upstream from gage.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,110 ft<sup>3</sup>/s (31.4 m<sup>3</sup>/s) Oct. 4, gage height, 10.47 ft (3.191 m); no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	4.5	1.2	.71	1.2	.60	.69	1.4	.06	.15	.00	1.4
2	.15	2.9	1.1	.80	1.2	.52	.72	1.4	.04	.11	.00	.58
3	.10	2.0	1.2	.90	1.2	.73	.68	1.2	.02	.09	.00	.25
4	269	1.4	1.2	.91	1.1	.76	.62	1.2	.00	.06	.00	.15
5	200	1.4	1.2	.77	.93	.67	.60	1.8	.00	.04	.00	.12
6	11	1.2	1.0	.63	.95	.49	.64	3.5	.00	.03	.00	.06
7	62	1.2	.97	.72	1.0	.64	.61	2.3	.00	.02	.00	.04
8	34	1.1	.93	.86	1.0	.60	.72	1.7	.00	2.2	.00	.04
9	8.1	1.1	.93	.98	1.1	.69	.71	3.9	.00	8.6	.00	.03
10	4.6	1.1	1.0	1.0	1.2	.55	.77	44	.00	1.3	.00	.01
11	3.0	1.1	.87	1.0	2.2	.61	.77	6.7	.00	.93	.00	.00
12	2.3	.95	.91	1.4	2.0	.52	.96	2.9	.04	.46	.00	.00
13	1.6	1.2	.91	1.9	1.7	.51	1.1	1.9	.02	.12	.00	.00
14	1.2	1.8	.96	1.6	1.5	.52	78	1.3	.01	.09	.00	.00
15	1.4	1.6	.93	1.5	1.1	.60	49	1.1	.00	.06	.00	.00
16	1.6	1.4	.82	1.1	1.1	.54	2.4	.88	.00	.04	.00	.00
17	1.6	1.2	.81	1.2	1.1	.46	7.5	.76	.00	.04	.00	.00
18	1.6	1.2	.81	1.1	1.1	.65	2.1	.66	.00	.03	.00	.00
19	1.5	1.2	.91	1.1	1.0	.63	2.7	.62	.00	.02	.02	.00
20	1.4	1.2	.70	1.0	.89	.53	25	2.0	.00	.02	.67	.00
21	1.4	1.1	.74	1.1	.98	.56	81	1.2	.67	.01	.05	.00
22	1.4	1.1	.87	1.4	.90	.55	5.4	.63	1.2	26	.00	.00
23	1.4	1.2	.98	1.7	.72	.61	1.8	.45	8.7	5.2	.68	.00
24	1.4	1.3	.77	1.4	.76	.66	1.6	.31	6.6	1.5	.12	.00
25	1.4	1.3	.72	1.4	.85	.69	1.4	.26	1.6	.25	.00	.00
26	1.4	1.3	.76	1.5	.67	5.5	1.1	.35	1.4	.03	.00	.00
27	2.4	.94	.74	1.4	.69	6.0	.95	.45	1.2	.00	15	.00
28	6.9	.81	.71	1.3	.60	2.8	.82	.35	.57	.00	318	.00
29	37	1.0	.62	1.1	---	1.6	.58	.37	.29	.30	37	.00
30	12	1.1	.68	1.2	---	1.1	.39	.80	.21	.02	18	.00
31	7.0	---	.55	1.2	---	.81	---	.15	---	.00	5.4	---
TOTAL	680.05	41.90	27.50	35.88	30.74	32.70	271.33	86.54	22.63	47.72	394.94	2.68
MEAN	21.9	1.40	.89	1.16	1.10	1.05	9.04	2.79	.75	1.54	12.7	.089
MAX	269	4.5	1.2	1.9	2.2	6.0	81	44	8.7	26	318	1.4
MIN	.10	.81	.55	.63	.60	.46	.39	.15	.00	.00	.00	.00
AC-FT	1350	83	55	71	61	65	538	172	45	95	783	5.3
CAL YR 1976	TOTAL	2911.43	MEAN	7.95	MAX	1100	MIN	.00	AC-FT	5770		
WTR YR 1977	TOTAL	1674.61	MEAN	4.59	MAX	318	MIN	.00	AC-FT	3320		

COLORADO RIVER BASIN

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08119500 COLORADO RIVER NEAR IRA, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--Chemical analyses: November 1958 to September 1970, November 1974 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1958 to September 1970, November 1974 to current year.

WATER TEMPERATURES: November 1958 to September 1970, November 1974 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 87,800 micromhos May 8, 1960; minimum daily, 305 micromhos Sept. 6, 1962.

WATER TEMPERATURES: Maximum daily, 36.0°C July 23, 24, 1969; minimum daily, 0.0°C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 27,400 micromhos July 7; minimum daily, 689 micromhos Aug. 28.

WATER TEMPERATURES: Minimum daily, 0.0°C on several days during winter months.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 06...	1530	9.9	3530	7.5	21.0	340	230	95	26	620
NOV 22...	1245	.98	14200	7.8	9.0	1300	1100	310	130	2800
JAN 28...	1255	1.5	15100	7.8	7.0	1500	1300	360	150	3200
FEB 26...	1115	.67	17900	7.9	8.0	1500	1400	370	150	3600
MAR 14...	1340	.55	18800	7.9	22.0	1600	1500	350	180	3800
APR 12...	0715	.96	20500	7.9	15.0	1700	1500	400	170	4100
MAY 04...	1700	1.1	10000	7.4	27.0	1000	900	230	110	1900
SEP 08...	0920	.05	19800	7.4	27.0	1500	1400	380	140	3900

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 06...	15	9.0	134	0	200	980	.3	7.8	2000
NOV 22...	34	12	215	0	1100	4500	--	3.6	8960
JAN 28...	36	10	228	0	1300	4700	--	1.5	9830
FEB 26...	40	11	230	0	1400	5700	--	2.6	11300
MAR 14...	41	22	188	0	1500	5900	--	2.5	11800
APR 12...	43	14	200	0	1700	6400	--	2.6	12900
MAY 04...	26	11	150	0	830	2900	--	3.6	6060
SEP 08...	43	20	120	0	1200	6500	--	8.3	12200



## COLORADO RIVER BASIN

08119500 COLORADO RIVER NEAR IRA, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA.MG) (MG/L)
OCT. 1976.....	680.05	1950	1140	2100	480	884	150	284	190
NOV. 1976.....	41.9	10700	6580	744	3270	370	820	93	****
DEC. 1976.....	27.5	14400	9020	669	4540	337	1060	79	****
JAN. 1977.....	35.88	14800	9310	902	4690	455	1090	106	****
FEB. 1977.....	30.74	15600	9820	815	4970	412	1140	94	****
MAR. 1977.....	32.7	16100	10200	897	5140	454	1170	103	****
APR. 1977.....	271.33	3260	1920	1400	900	663	250	186	330
MAY 1977.....	86.54	5250	3160	739	1520	355	410	96	530
JUNE 1977.....	22.63	13700	8560	523	4290	262	1020	63	1170
JULY 1977.....	47.72	8100	4890	630	2360	304	640	82	810
AUG. 1977.....	394.94	1140	660	708	250	264	91	97	110
SEPT 1977.....	2.68	10300	6290	45	3090	22	790	5.5	****
TOTAL .....	1674.6	**	**	10200	**	4780	**	1290	**
WTD.AVG. ....	4.59	3710	2200	**	1100	**	280	**	370

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5670	5670	14100	15800	15500	16400	15900	7890	23500	24300	---	8060
2	6360	6280	14100	14900	15400	16600	16700	6020	25400	25100	---	9900
3	8120	7270	14300	14700	15300	17300	17000	8780	27200	25400	---	12000
4	1250	7710	14400	14700	15400	17600	18400	9590	---	25200	---	13900
5	910	8400	13700	14800	14800	17300	18500	9500	---	25700	---	15900
6	3220	9240	13800	16200	15300	17000	18700	7550	---	26900	---	17100
7	1570	9720	13500	15300	15100	17100	19100	8520	---	27400	---	18900
8	1600	9860	13700	14800	14800	17200	19400	9810	---	12500	---	19400
9	2610	11000	14200	15800	15100	17300	19800	7750	---	7630	---	22500
10	4220	11400	14500	16800	15500	17200	20400	2190	---	10900	---	23600
11	6250	11800	14300	15400	13600	17000	20800	2940	---	13100	---	---
12	7120	11400	14200	14500	15400	17800	20400	4020	12500	18600	---	---
13	8230	11600	14300	13900	13800	18200	20000	5330	16000	20200	---	---
14	10400	8090	14100	13600	14300	18800	4500	7430	23500	21400	---	---
15	11000	10500	14100	13700	15700	19100	1230	8740	---	22000	---	---
16	11200	10900	14200	14500	16200	18900	2410	9120	---	22900	---	---
17	12100	11400	14300	15900	15800	18600	3260	10000	---	24000	---	---
18	12500	12200	14500	15700	15700	20200	3960	11400	---	24700	---	---
19	12800	13000	14700	15600	16200	20100	3750	12200	---	25200	15000	---
20	13200	13600	15000	16200	16100	20000	2020	13100	---	25800	5920	---
21	13900	13800	15300	15800	17600	19800	1500	13400	22500	26200	24300	---
22	14900	14200	15600	14800	16900	20600	2490	14300	20700	7630	---	---
23	14500	14400	14600	13800	18200	20400	3580	15400	11400	4400	7500	---
24	14300	14000	14100	13400	18100	20000	5420	16700	13000	6380	22900	---
25	14100	14200	14600	13600	17900	20600	6120	18300	13800	9860	---	---
26	14000	14800	14700	14100	17800	15000	7160	16700	15000	10400	---	---
27	13000	15100	15000	14500	17600	12700	8280	18800	15600	---	2000	---
28	8720	16200	15300	14700	16700	14400	9440	19000	16000	---	689	---
29	3500	16500	14900	15500	---	14900	10300	20700	19200	8000	1930	---
30	2670	14800	14500	15400	---	15300	10600	18800	22000	16000	4490	---
31	4720	---	15600	16400	---	16000	---	21400	---	---	6870	---
MEAN	8340	11600	14500	15000	15900	17700	11000	11500	18600	18500	9160	16100

## COLORADO RIVER BASIN

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08119500 COLORADO RIVER NEAR IRA, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28.0	18.0	1.0	0.5	0.5	5.0	10.0	30.0	21.0	---	---	25.0
2	19.0	10.0	1.0	6.0	6.5	11.0	11.0	20.0	21.0	---	---	23.0
3	30.5	15.0	3.0	0.0	4.5	8.0	11.5	23.5	21.5	---	---	22.0
4	27.0	10.0	7.0	3.0	8.0	3.5	20.0	20.0	---	---	---	35.0
5	15.0	9.5	8.5	4.0	3.0	5.0	8.5	20.0	---	---	---	25.0
6	14.5	10.0	5.0	0.5	15.0	3.0	9.5	18.0	---	---	---	23.0
7	12.0	10.0	0.0	1.0	7.0	4.0	10.5	26.0	---	---	---	22.0
8	15.0	7.0	10.0	5.5	5.5	6.0	12.0	29.0	---	---	---	21.0
9	10.5	11.0	5.0	0.0	6.0	8.0	13.0	20.0	---	24.0	---	34.0
10	13.0	20.0	8.0	0.0	9.0	10.5	26.0	19.0	---	25.0	---	36.0
11	20.0	10.5	3.0	0.0	13.0	6.5	13.0	18.0	---	22.0	---	---
12	14.0	6.0	8.5	1.5	9.5	6.0	15.0	18.5	20.5	35.0	---	---
13	16.0	2.0	4.0	3.5	18.0	8.0	18.0	19.0	---	---	---	---
14	18.0	8.5	8.0	3.0	7.0	9.0	15.0	29.0	---	---	---	---
15	21.0	3.0	13.0	3.0	7.0	8.5	12.0	32.0	---	---	---	---
16	13.0	3.0	3.0	5.0	14.0	9.0	15.0	23.0	---	---	---	---
17	20.0	3.5	2.0	0.0	7.0	11.5	20.0	21.0	---	---	---	---
18	12.0	7.0	5.0	0.0	8.0	7.0	15.5	20.5	---	---	---	---
19	10.0	10.0	7.0	0.0	8.0	10.0	18.0	20.5	---	---	---	---
20	18.5	10.0	2.0	1.0	6.0	21.5	16.5	23.0	---	---	25.0	---
21	13.0	8.0	0.0	3.0	16.0	7.0	14.0	17.0	30.5	---	33.0	---
22	17.0	5.0	0.0	6.0	15.0	19.5	15.0	18.5	24.5	29.5	---	---
23	18.0	10.0	0.0	6.0	10.0	17.0	14.5	19.0	22.0	24.0	27.0	---
24	17.0	14.0	7.0	3.0	15.5	10.0	28.5	20.0	23.0	25.0	31.0	---
25	11.0	12.0	3.0	2.0	8.0	13.0	16.5	20.0	26.0	29.0	---	---
26	12.0	16.5	6.5	5.5	8.0	15.0	16.5	20.5	22.0	23.0	---	---
27	11.0	3.5	4.5	5.0	3.0	13.0	17.0	25.0	23.5	---	---	---
28	8.0	0.0	5.0	5.0	3.0	18.5	17.0	20.5	23.0	---	22.0	---
29	8.0	0.0	2.0	0.0	---	10.5	26.5	21.5	35.5	23.5	25.0	---
30	6.0	0.0	4.0	3.0	---	22.0	17.0	25.0	23.0	23.0	33.0	---
31	8.5	---	0.0	0.0	---	10.5	---	23.0	---	---	34.0	---
MEAN	15.5	8.5	4.5	2.5	8.5	10.0	16.0	22.0	24.0	25.5	29.0	26.5

## COLORADO RIVER BASIN

08120500 DEEP CREEK NEAR DUNN, TX

LOCATION.--Lat 32°34'25", long 100°54'27", Scurry County, Hydrologic Unit 12080002, at center of downstream side of bridge on Farm Road 1606, 1.5 mi (2.4 km) northwest of Dunn, 2.7 mi (4.3 km) upstream from Sulphur Draw, and 8.6 mi (13.8 km) upstream from mouth.

DRAINAGE AREA.--198 mi<sup>2</sup> (513 km<sup>2</sup>), of which 10 mi<sup>2</sup> (25.9 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1953 to current year.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,172.17 ft (662.077 m) above mean sea level. Prior to Apr. 21, 1955, nonrecording gage at same site and datum.

REMARKS.--Records good. Several observations of water temperatures were made during the year.

AVERAGE DISCHARGE.--24 years (water years 1954-77), 11.9 ft<sup>3</sup>/s (0.337 m<sup>3</sup>/s), 0.86 in/yr (22 mm/yr), 8,620 acre-ft/yr (10.6 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,700 ft<sup>3</sup>/s (586 m<sup>3</sup>/s) Aug. 14, 1972, gage height, 31.28 ft (9.534 m), from flood-marks, from rating curve extended above 12,000 ft<sup>3</sup>/s (340 m<sup>3</sup>/s) by velocity-area study; no flow for many days each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1881, 36,400 ft<sup>3</sup>/s (1,030 m<sup>3</sup>/s) June 19, 1939, by slope-area measurement at site 8.0 mi (12.9 km) upstream from gage. Flood in 1892 reached about same stage as that of June 19, 1939, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 850 ft<sup>3</sup>/s (24.1 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 4	2315	*2,810	79.6	19.88	6.059	Aug. 28	0815	2,000	56.6	16.72	5.096

Minimum discharge, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	2.8	2.1	2.4	2.3	3.5	.68	5.2	.95	2.0	1.4	3.7
2	1.2	1.5	2.1	2.5	2.2	2.2	.54	3.3	1.0	1.8	1.6	3.4
3	1.3	.77	2.7	3.1	1.8	2.2	.54	3.0	1.2	1.6	1.6	3.1
4	563	.54	3.9	3.0	1.3	1.8	.27	3.3	1.3	1.6	1.0	3.0
5	359	.94	3.4	3.5	1.9	1.1	.12	2.8	.66	1.4	.98	3.9
6	14	2.2	3.2	3.2	2.1	1.1	.14	4.6	.86	1.0	.74	4.1
7	59	2.8	2.8	3.1	2.2	1.6	.68	2.8	.80	.82	.40	3.9
8	17	3.2	3.3	3.5	2.0	1.7	.58	2.6	.80	7.0	.27	3.4
9	4.5	3.5	2.4	3.3	2.2	1.9	.84	2.4	.58	20	.23	2.9
10	2.7	3.4	2.3	2.8	2.0	2.1	.73	4.0	.52	2.5	.15	2.9
11	1.8	3.6	2.2	2.3	4.3	2.1	.44	2.4	.24	1.6	.09	2.2
12	1.5	3.1	2.8	3.0	6.1	2.1	.40	2.2	.46	1.4	.07	1.8
13	1.7	3.1	2.8	4.1	3.0	2.3	.46	2.0	.97	.96	.05	1.3
14	1.8	2.9	3.4	3.3	2.6	1.9	2.7	2.0	.42	.77	.02	1.1
15	4.4	3.5	2.7	3.0	2.2	1.9	30	2.0	.10	.55	.01	1.1
16	1.7	3.3	2.5	3.1	2.1	1.7	14	2.0	.04	.36	.00	.86
17	1.4	2.5	3.0	2.8	1.9	1.9	27	1.9	.02	.16	.00	.46
18	1.3	2.8	2.8	2.8	2.1	2.1	3.7	1.7	.01	.07	.00	1.2
19	1.1	2.8	2.2	3.0	1.6	1.9	1.8	1.7	.00	.03	.00	1.9
20	2.3	2.9	2.1	2.8	1.5	1.4	32	2.3	.00	.01	.00	1.8
21	1.7	2.6	2.9	2.9	1.4	1.2	16	1.6	.00	.01	.00	1.8
22	1.1	1.8	3.2	2.8	1.5	1.2	4.3	1.6	107	63	.00	1.5
23	1.4	1.6	3.3	2.8	1.5	1.0	3.0	1.6	116	16	.01	1.0
24	2.3	1.2	3.9	2.9	1.5	.90	2.5	1.6	9.9	3.8	.01	1.4
25	1.8	1.2	3.6	2.9	1.1	.76	2.2	1.4	5.4	2.0	.01	1.3
26	2.3	1.4	2.6	2.6	.80	2.1	2.6	1.3	3.0	1.6	.00	.82
27	2.3	1.5	3.1	2.5	.75	28	2.5	1.3	1.9	1.4	5.6	.35
28	7.4	1.7	2.8	2.2	.84	3.5	2.4	1.3	1.7	1.5	1040	.36
29	50	1.5	3.0	1.7	---	1.9	2.7	1.4	1.8	1.7	66	.35
30	7.1	1.5	3.5	1.7	---	1.5	20	1.2	1.8	4.9	9.4	.12
31	3.3	---	3.0	2.4	---	1.1	---	1.1	---	2.3	4.7	---
TOTAL	1122.6	68.15	89.6	88.0	56.79	81.66	175.82	69.6	259.43	143.84	1134.34	57.02
MEAN	36.2	2.27	2.89	2.84	2.03	2.63	5.86	2.25	8.65	4.64	36.6	1.90
MAX	563	3.6	3.9	4.1	6.1	28	32	5.2	116	63	1040	4.1
MIN	1.1	.54	2.1	1.7	.75	.76	.12	1.1	.00	.01	.00	.12
CFSM	.18	.01	.02	.01	.01	.01	.03	.01	.04	.02	.19	.01
IN.	.21	.01	.02	.02	.01	.02	.03	.01	.05	.03	.21	.01
AC-FT	2230	135	178	175	113	162	349	138	515	285	2250	113
CAL YR 1976	TOTAL	2064.21	MEAN	5.64	MAX	563	MIN	.00	CFSM	.03	IN	.39
WTR YR 1977	TOTAL	3346.85	MEAN	9.17	MAX	1040	MIN	.00	CFSM	.05	IN	.63
									AC-FT	4090	AC-FT	6640

COLORADO RIVER BASIN

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08120500 DEEP CREEK NEAR DUNN, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)
MAR 14...	1140	1.9	1720	7.9	14.0	420	110	120	30
DATE	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
MAR 14...	210	4.4	13	384	0	250	230	18	1060



## COLORADO RIVER BASIN

08120700 COLORADO RIVER NEAR CUTHBERT, TX

LOCATION.--Lat 32°28'41", long 100°56'54", Mitchell County, Hydrologic Unit 12080002, on left bank at downstream side of bridge on Farm Road 1808, 4.0 mi (6.4 km) downstream from Deep Creek, 4.8 mi (7.7 km) east of Cuthbert, 8.0 mi (12.9 km) northwest of Colorado City, and at mile 810.6 (1,304.3 km).

DRAINAGE AREA.--4,028 mi<sup>2</sup> (10,433 km<sup>2</sup>), of which 2,600 mi<sup>2</sup> (6,730 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1965 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,073.49 ft (632.000 m) above mean sea level.

REMARKS.--Water-discharge records good. Flow is partly regulated by Lake J. B. Thomas (station 08118000).

AVERAGE DISCHARGE.--12 years (water years 1966-77), 32.0 ft<sup>3</sup>/s (0.906 m<sup>3</sup>/s), 23,180 acre-ft/yr (28.6 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,500 ft<sup>3</sup>/s (326 m<sup>3</sup>/s) Aug. 14, 1972, gage height, 25.99 ft (7.922 m); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods in 1941 and 1946 reached a stage of 36.1 ft (11.00 m), from Texas Highway Department bridge plans.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,040 ft<sup>3</sup>/s (171 m<sup>3</sup>/s) Aug. 28, gage height, 18.08 ft (5.511 m); no flow June 17-21, Aug. 8-19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	22	7.0	8.3	7.0	4.5	6.5	22	2.7	5.4	2.9	21
2	5.4	18	6.7	7.8	6.9	6.4	6.0	16	2.8	4.6	1.2	15
3	4.9	14	7.2	7.5	6.6	5.7	5.2	12	2.5	4.1	.66	12
4	75	12	7.5	8.3	6.6	5.2	5.2	9.5	1.2	3.0	.42	11
5	2480	10	9.2	8.4	6.5	5.3	4.7	8.2	.65	2.1	.24	9.0
6	325	9.3	9.3	8.3	6.1	5.1	4.2	9.5	.41	1.8	.11	12
7	111	9.2	9.0	8.5	6.6	5.0	4.0	15	.29	1.5	.02	10
8	214	8.6	8.3	8.1	6.6	5.0	4.1	10	.18	1.4	.00	8.7
9	58	8.4	7.9	12	6.6	5.0	4.2	47	.11	18	.00	7.1
10	29	7.9	7.8	9.1	6.6	5.4	4.2	152	.09	18	.00	6.3
11	20	8.1	7.2	8.1	8.2	5.8	4.1	44	.06	8.7	.00	5.7
12	15	8.4	7.2	8.2	14	5.1	3.8	12	.07	3.7	.00	5.3
13	12	11	7.9	9.8	12	5.0	3.8	7.7	.07	1.4	.00	4.7
14	11	13	7.9	12	8.6	5.1	17	6.6	.04	.61	.00	3.9
15	12	15	8.5	11	7.9	5.3	318	5.8	.02	.40	.00	3.2
16	13	15	8.5	9.8	6.9	4.7	85	5.3	.01	.24	.00	2.5
17	8.2	12	8.2	8.6	6.0	5.2	113	5.1	.00	.16	.00	2.5
18	7.3	11	8.3	7.5	6.3	5.6	40	5.4	.00	.07	.00	2.4
19	6.4	11	8.6	7.5	6.1	5.3	22	5.3	.00	.04	.00	2.2
20	6.0	10	8.0	7.5	5.9	4.8	80	47	.00	.02	1.3	2.3
21	6.7	9.8	7.2	7.2	5.6	4.7	360	97	.00	.65	5.4	2.6
22	6.4	8.9	7.6	7.6	5.6	4.5	125	15	103	96	.33	2.7
23	6.0	8.5	7.9	9.3	5.6	4.3	38	8.3	475	141	25	2.2
24	6.1	8.1	8.2	9.4	5.2	4.5	40	6.4	227	23	15	2.0
25	6.6	7.9	9.0	9.4	5.0	4.5	38	5.3	29	16	3.9	1.7
26	6.7	8.2	9.0	9.3	5.2	5.9	36	4.2	23	7.2	.83	1.6
27	8.9	8.0	8.2	8.9	5.2	49	33	3.8	14	3.7	29	1.6
28	17	7.5	8.1	8.5	4.9	27	29	3.5	9.6	1.9	3660	1.3
29	146	7.4	8.1	8.0	---	14	26	3.0	7.6	2.4	1300	1.0
30	95	7.2	8.2	7.3	---	10	22	3.0	6.4	6.3	84	.83
31	38	---	8.5	6.7	---	7.8	---	4.4	---	7.2	33	---
TOTAL	3763.4	315.4	250.2	267.9	190.3	240.7	1482.0	599.3	905.80	380.59	5163.31	164.33
MEAN	121	10.5	8.07	8.64	6.80	7.76	49.4	19.3	30.2	12.3	167	5.48
MAX	2480	22	9.3	12	14	49	360	152	475	141	3660	21
MIN	4.9	7.2	6.7	6.7	4.9	4.3	3.8	3.0	.00	.02	.00	.83
AC-FT	7460	626	496	531	377	477	2940	1190	1800	755	10240	326
CAL YR 1976	TOTAL	11966.78	MEAN	32.7	MAX	2510	MIN	.00	AC-FT	23740		
WTR YR 1977	TOTAL	13723.23	MEAN	37.6	MAX	3660	MIN	.00	AC-FT	27220		

COLORADO RIVER BASIN

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08120700 COLORADO RIVER NEAR CUTHBERT, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: March 1965 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: March 1965 to current year.

WATER TEMPERATURES: March 1965 to current year.

INSTRUMENTATION.--Specific conductance is recorded continuously at this station.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 70,000 micromhos Nov. 17, 1968; minimum daily, 290 micromhos Aug. 14, 1972.

WATER TEMPERATURES: Maximum daily, 36.0°C Aug. 2, 1966; minimum daily, 0.0°C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 9,200 micromhos June 16; minimum daily, 557 micromhos Oct. 5.

WATER TEMPERATURES: Maximum daily, 34.0°C June 16, July 19; minimum daily, 0.0°C on several days during December and January.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 07...	1510	69	2930	7.7	12.0	420	260	110	35	450
NOV 17...	1125	9.9	5720	8.1	6.5	1000	780	230	110	840
DEC 27...	1425	6.0	5690	8.1	9.0	1100	820	250	120	950
JAN 28...	1000	8.7	6210	8.1	7.0	1100	820	250	120	1000
MAR 14...	1030	5.3	6010	8.3	13.0	1200	900	260	130	950
APR 29...	0800	14	3770	8.0	20.0	690	510	150	77	600
JUL 14...	1550	.57	5630	7.1	34.0	870	740	210	85	960
AUG 24...	1635	16	1010	7.7	32.0	220	110	59	18	110
SEP 12...	1600	5.0	4410	7.5	30.0	790	580	190	76	730

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 07...	9.6	7.6	198	0	270	700	.4	8.4	1680
NOV 17...	11	10	300	0	840	1300	--	4.5	3480
DEC 27...	12	8.8	362	0	960	1300	--	2.0	3770
JAN 28...	13	8.2	360	0	1000	1400	--	2.2	3960
MAR 14...	12	15	352	0	1000	1300	--	1.3	3830
APR 29...	9.9	8.3	220	0	580	820	1.0	5.6	2350
JUL 14...	14	11	170	0	600	1500	--	8.5	3460
AUG 24...	3.2	5.8	140	0	130	160	.4	7.6	560
SEP 12...	11	9.9	250	0	500	1200	.6	12	2840

## COLORADO RIVER BASIN

08120700 COLORADO RIVER NEAR CUTHBERT, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTMRRER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	3763.4	1330	760	7710	230	2320	190	1910	240
NOV. 1976.....	315.4	4960	3030	2580	1240	1050	550	470	820
DEC. 1976.....	250.2	5900	3640	2460	1560	1050	600	404	870
JAN. 1977.....	267.9	6010	3710	2690	1590	1150	600	434	880
FEB. 1977.....	190.3	6170	3820	1960	1650	849	600	310	890
MAR. 1977.....	240.7	6340	3930	2550	1710	1110	610	394	890
APR. 1977.....	1481	2640	1540	6140	560	2230	320	1300	470
MAY 1977.....	599.3	2760	1610	2600	580	941	340	552	490
JUNE 1977.....	905.8	1190	660	1620	180	452	150	373	210
JULY 1977.....	380.59	2550	1480	1520	530	540	310	323	450
AUG. 1977.....	5163.31	713	390	5460	74	1030	120	1710	130
SEPT 1977.....	164.33	4500	2740	1210	1060	471	560	246	800
TOTAL .....	13723.2	**	**	38500	**	13200	**	8430	**
WTD.AVG. ....	37.6	1780	1000	**	360	**	230	**	320

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3940	2750	5940	5790	6340	6390	5330	2880	3790	3680	3050	3940
2	4220	3180	6010	5630	6360	6430	5780	3010	4870	3700	2910	4310
3	4260	3600	6170	5820	6260	6470	6190	4520	5490	3660	2900	4580
4	1860	4020	6140	5970	6140	6320	6300	4980	5450	3650	3050	4620
5	557	4270	5980	6140	6120	6120	6270	5400	5490	3630	3100	4680
6	1990	4570	5590	6030	6310	5940	6080	5450	5840	3620	3220	4450
7	2930	4610	5680	5830	6090	6010	5840	4880	6060	3690	3600	4410
8	1620	4740	5810	5810	6000	6160	5890	4620	6320	3790	---	4300
9	1890	4850	5880	4550	5970	6380	5960	1700	6860	1820	---	4190
10	3000	4920	5800	5220	6090	6300	5890	2090	7200	1500	---	4250
11	3550	5720	5880	5590	5950	6200	5880	4720	7540	4850	---	4330
12	4180	5850	5970	6080	5980	6270	5940	2560	7730	4780	---	4360
13	4600	5940	6090	6160	5510	6310	5860	2640	8030	4960	---	4310
14	4970	5980	6030	6270	6340	6190	5500	2980	8350	5520	---	4510
15	4740	5270	5940	5850	6560	6050	3280	3200	8520	5890	---	4620
16	5830	5400	6030	6400	6330	6080	2100	3340	9200	6130	---	4940
17	4440	5600	5910	6560	6690	5910	2070	3470	---	6460	---	4980
18	4650	5610	6050	6620	6290	5770	2460	3540	---	6750	---	5460
19	4940	5570	5860	6400	6400	5970	3000	3620	---	6960	---	5570
20	5340	5550	5960	6080	6210	6030	2780	1800	---	7130	6350	5750
21	5640	5530	5950	6340	6160	6060	1530	1870	---	7540	5340	5580
22	5830	5320	5920	6280	6210	5770	1790	2390	1440	2990	3420	5420
23	5190	5490	5810	6070	6200	5950	2290	3290	822	1640	1290	5360
24	5510	5440	5670	6040	6220	6080	2730	3420	990	2970	933	5050
25	5730	5400	5960	6150	6240	6110	2990	3710	2160	3350	2920	4740
26	5690	5570	5560	6140	6190	6120	3340	3880	2590	3760	3380	4660
27	5150	5690	5730	6200	6140	7340	3600	4010	3800	3690	2090	4640
28	5410	5850	5960	6250	6340	6500	3750	4090	3470	3760	558	4700
29	4170	5900	5950	6280	---	5970	3870	4160	3160	3780	706	4890
30	3330	5790	5930	6050	---	4870	3880	4170	3340	3490	5220	4990
31	3040	---	6010	6300	---	5570	---	3950	---	3120	3270	---
MEAN	4140	5130	5910	6030	6200	6120	4270	3560	5140	4270	3020	4750

COLORADO RIVER BASIN

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08120700 COLORADO RIVER NEAR CUTHBERT, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22.0	9.0	4.0	1.0	10.0	5.0	11.0	24.0	23.0	32.0	28.0	25.0
2	22.0	9.0	0.0	2.0	8.0	11.0	22.0	21.0	30.0	26.0	26.5	24.0
3	24.0	10.0	1.0	10.0	4.0	9.0	22.0	23.0	27.0	---	25.0	24.0
4	17.0	11.0	7.0	3.0	2.0	11.0	10.0	22.0	24.0	---	33.0	33.0
5	15.0	9.0	8.0	2.0	6.0	6.0	10.0	21.0	27.0	---	31.0	29.0
6	19.0	18.0	5.0	7.0	9.0	14.0	11.0	19.0	31.0	30.0	25.0	24.0
7	12.0	15.0	0.0	1.5	7.0	4.0	12.0	21.0	30.0	33.0	32.0	23.0
8	10.0	8.0	1.0	5.0	11.0	7.0	23.0	24.0	20.0	27.0	---	---
9	17.0	10.0	4.0	---	5.0	9.0	23.0	21.0	31.0	25.0	---	24.0
10	20.0	10.0	8.0	---	8.0	11.0	20.0	15.0	30.0	33.0	---	24.0
11	13.0	11.0	5.0	3.0	9.0	9.0	---	19.0	25.0	31.0	---	28.0
12	13.0	---	10.0	3.0	9.0	6.0	16.0	20.0	30.0	30.0	---	23.0
13	14.0	---	4.0	3.0	15.0	17.0	15.0	19.0	32.0	25.0	---	22.0
14	14.0	8.0	6.0	3.0	12.0	10.0	15.0	25.0	33.0	27.0	---	20.0
15	18.0	3.0	4.0	10.0	8.0	17.0	13.0	28.0	26.0	33.0	---	20.0
16	16.0	3.0	3.0	6.0	5.0	10.0	14.0	22.0	34.0	25.0	---	22.0
17	13.0	10.0	2.0	0.0	6.0	13.0	16.0	21.0	---	---	---	23.0
18	13.0	6.0	8.0	0.0	8.0	18.0	14.0	21.0	---	32.0	---	27.0
19	16.0	8.0	13.0	8.0	7.0	12.0	17.0	22.0	---	34.0	---	22.0
20	9.0	---	6.0	0.0	16.0	---	17.0	22.0	---	28.0	---	22.0
21	9.0	9.0	0.0	---	7.0	16.0	16.0	---	---	33.5	27.0	23.0
22	9.0	8.0	1.0	---	12.0	7.0	14.0	24.0	---	---	30.0	23.0
23	17.0	5.0	---	---	---	---	21.0	27.0	---	25.0	---	23.0
24	16.0	5.0	7.0	5.0	---	12.0	23.0	21.0	---	32.0	25.0	---
25	17.0	11.0	9.0	7.0	---	13.0	16.0	21.0	---	---	30.0	30.0
26	---	15.0	10.0	6.0	8.0	15.0	16.0	21.0	---	33.0	29.0	27.0
27	12.0	5.0	11.0	5.0	10.0	15.0	17.0	---	---	27.0	23.0	21.0
28	9.0	3.0	11.0	5.0	3.0	---	18.0	---	---	31.0	28.0	23.0
29	8.0	5.0	9.0	0.0	---	18.0	20.0	30.0	---	32.0	23.0	23.0
30	13.0	3.0	7.0	2.0	---	12.0	28.0	28.0	---	26.0	24.0	24.0
31	13.0	---	6.0	8.0	---	12.0	---	28.0	---	---	24.0	---
MEAN	14.5	8.5	5.5	4.0	8.0	11.5	17.0	22.5	28.5	29.5	27.5	24.0



## COLORADO RIVER BASIN

## 08121000 COLORADO RIVER AT COLORADO CITY, TX

LOCATION.--Lat 32°23'33", long 100°52'42", Mitchell County, Hydrologic Unit 12080002, on right bank at Colorado City, 3,517 ft (1,072 m) upstream from bridge on State Highway 377, 4,100 ft (1,250 m) upstream from the Texas and Pacific Railroad Co. bridge, 1.3 mi (2.1 km) downstream from bridge on Interstate Highway 20 and U.S. Highway 80, 1.6 mi (2.6 km) upstream from Lone Wolf Creek, and at mile 796.3 (1,281.2 km).

DRAINAGE AREA.--4,082 mi<sup>2</sup> (10,572 km<sup>2</sup>), of which 2,600 mi<sup>2</sup> (6,730 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1923 to August 1925 (published as "at Colorado"), May 1946 to current year.

REVISED RECORDS.--WSP 1118: Drainage area. WSP 1512: 1946(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 2,030.16 ft (618.793 m) above mean sea level. Nov. 28, 1923, to Aug. 31, 1925, nonrecording gage at site 1.4 mi (2.3 km) downstream at different datum. May 9 to Aug. 5, 1946, nonrecording gage at site 185 ft (56 m) upstream at present datum.

REMARKS.--Water-discharge records good. Some regulation since 1952 by Lake J. B. Thomas (station 08118000). Numerous diversions from Lake J. B. Thomas for municipal use and oilfield operation. Record of diversion from river, 3 mi (5 km) upstream from gage, furnished by Colorado River Municipal Water District.

AVERAGE DISCHARGE.--6 years (water years 1947-52) prior to completion of Lake J. B. Thomas, 85.4 ft<sup>3</sup>/s (2.419 m<sup>3</sup>/s), 61,870 acre-ft/yr (76.3 hm<sup>3</sup>/yr); 25 years (water years 1953-77) regulated, 37.2 ft<sup>3</sup>/s (1.054 m<sup>3</sup>/s), 26,950 acre-ft/yr (33.2 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,900 ft<sup>3</sup>/s (705 m<sup>3</sup>/s) July 6, 1948, gage height, 22.37 ft (6.818 m), from floodmark; maximum gage height, 24.89 ft (7.586 m) Aug. 14, 1972; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1910, 35.9 ft (10.94 m) June 20, 1939, present site and datum, based on floodmarks 1,000 ft (305 m) upstream and 3,740 ft (1,140 m) downstream from gage; discharge, 66,000 ft<sup>3</sup>/s (1,870 m<sup>3</sup>/s) by slope-area measurement of peak flow at site 2.5 mi (4.0 km) upstream from gage.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,940 ft<sup>3</sup>/s (83.3 m<sup>3</sup>/s) Aug. 29, gage height, 17.00 ft (5.182 m); no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.62	39	.27	.15	.62	.42	.42	.64	3.1	6.1	.09	7.6
2	.62	28	.24	.18	.62	.41	.39	10	.21	.79	.09	2.5
3	.56	23	.24	.23	.64	.41	.35	19	.07	.31	.09	1.8
4	4.9	13	.24	.26	.40	.39	.32	10	.05	.20	.05	1.5
5	1100	.65	.24	.15	.24	.37	.24	1.3	.04	.23	.03	1.5
6	854	.41	.49	.16	.38	.41	.30	.89	.04	.26	.02	.92
7	115	.39	11	.15	.41	.41	.40	.41	.03	.28	.01	4.1
8	184	.15	12	.30	.41	.40	.43	.31	.02	.60	.00	2.1
9	120	.20	12	.40	.41	.44	.41	2.7	.03	.72	.00	.94
10	61	.24	12	.19	.40	.48	.42	263	.02	.34	.00	.87
11	40	.24	11	7.5	3.3	.51	.49	90	.01	.20	.00	.68
12	29	.21	11	11	14	.28	.63	37	.04	.13	.02	.66
13	2.1	.78	11	12	18	.39	.60	21	.03	.06	.05	.62
14	1.2	.71	11	14	15	.35	5.6	16	.01	.04	.09	.62
15	1.3	3.5	11	15	13	.35	166	13	.01	.03	.09	.41
16	.98	17	12	15	12	.28	148	12	.01	.02	.05	.41
17	.63	16	7.7	13	11	.43	139	7.5	.00	.02	.05	.45
18	.41	16	.54	13	11	.44	81	.93	.00	.01	.03	.52
19	.35	16	.38	12	8.2	.50	60	.51	.00	.01	.03	.44
20	.24	16	.26	12	.75	.26	37	3.3	.00	.00	.24	.41
21	.24	15	.17	12	.41	.29	245	98	.29	.00	.24	.41
22	.31	14	.24	13	.41	.35	177	43	7.0	.16	.41	.41
23	.40	9.0	.22	14	.51	.38	64	19	247	102	.41	.35
24	.41	.55	.24	8.3	.22	.24	34	12	249	48	.62	.33
25	.41	.48	.24	.54	.26	.21	25	10	26	23	.62	.41
26	.36	.48	6.7	.56	.53	1.7	20	5.7	29	15	.41	.26
27	1.8	.27	.73	.64	.44	1.9	17	.29	23	7.3	.41	.38
28	11	.24	.30	.55	.38	31	15	.08	14	.50	1390	.41
29	120	.19	.22	.41	---	22	9.4	.05	10	.41	2070	.24
30	140	.24	.23	.57	---	10	1.0	.03	8.5	.24	214	.18
31	71	---	.15	.58	---	.71	---	.02	---	.15	67	---
TOTAL	2862.84	231.93	134.04	177.82	113.94	76.71	1249.40	697.66	617.51	207.11	3745.15	32.43
MEAN	92.3	7.73	4.32	5.74	4.07	2.47	41.6	22.5	20.6	6.68	121	1.08
MAX	1100	39	12	15	18	31	245	263	249	102	2070	7.6
MIN	.24	.15	.15	.15	.22	.21	.24	.02	.00	.00	.00	.18
AC-FT	5680	460	266	353	226	152	2480	1380	1220	411	7430	64
(†)	476	338	269	290	258	404	235	258	206	428	302	434

CAL YR 1976 TOTAL 9371.10 MEAN 25.6 MAX 1640 MIN .00 AC-FT 18590 † 4340  
WTR YR 1977 TOTAL 10146.54 MEAN 27.8 MAX 2070 MIN .00 AC-FT 20130 † 3900

† Diversions, in acre-feet, for brine disposal by Colorado River Municipal Water District.

## COLORADO RIVER BASIN

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08121000 COLORADO RIVER AT COLORADO CITY, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: May 1946 to September 1954, November 1956 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 1946 to September 1954, November 1956 to current year.

WATER TEMPERATURES: November 1952 to September 1954, November 1956 to current year.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (1946-54, 1956-69, 1971-77): Maximum daily, 67,400 micromhos May 14, 17, 1961; minimum daily, 245 micromhos May 14, 1957.

WATER TEMPERATURES (1956-69, 1971-77): Maximum daily, 37.0°C July 29, 1960, July 9, 1965, and July 1, 1973; minimum daily, 0.0°C on many days during winter months.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 13,000 micromhos Sept. 21; minimum daily, 614 micromhos Aug. 29.

WATER TEMPERATURES: Maximum daily, 36.0°C July 16, 19; minimum daily, 2.0°C on several days during winter months.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 01...	0740	.20	5330	8.2	17.0	810	650	160	100	910
NOV 18...	1140	16	7230	8.0	9.0	910	680	200	100	1300
DEC 30...	0950	.32	9580	7.5	5.0	1600	1300	330	180	1800
JAN 28...	0855	.21	8240	7.8	4.0	1500	1200	300	180	1400
FEB 10...	1335	.32	9200	7.4	11.0	1600	1500	310	190	1600
MAR 14...	0930	.34	10100	7.6	13.5	1700	1500	330	210	1800
APR 13...	1215	.70	12500	--	19.0	1300	1200	280	150	2400
MAY 05...	0910	.74	6440	7.6	21.0	870	670	190	95	1100
JUN 15...	--	.01	7040	7.5	36.0	580	350	130	63	1300
JUL 28...	1140	.64	3540	7.4	28.0	440	300	110	40	600
AUG 29...	1615	1720	796	7.1	28.5	150	47	50	7.1	98

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 01...	14	11	196	0	850	1200	--	1.3	3330
NOV 18...	19	9.5	288	0	900	1800	--	4.1	4460
DEC 30...	20	9.4	350	0	1400	2500	--	4.2	6400
JAN 28...	16	8.5	324	0	1500	2000	--	1.2	5550
FEB 10...	18	10	130	0	1600	2300	--	1.7	6080
MAR 14...	19	13	280	0	1800	2500	--	1.1	6790
APR 13...	29	12	160	0	1400	3500	--	1.9	7820
MAY 05...	16	8.0	240	0	780	1600	--	5.4	3900
JUN 15...	23	11	290	0	880	1500	--	1.8	4030
JUL 28...	12	8.0	170	0	340	960	.7	8.0	2150
AUG 29...	3.4	5.4	130	0	64	140	.2	7.2	436

## COLORADO RIVER BASIN

08121000 COLORADO RIVER AT COLORADO CITY, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DTS- SOLVED SOLIDS (MG/L)	DTS- SOLVED SOLIDS (TONS)	DTS- SOLVED CHLORIDE (MG/L)	DTS- SOLVED CHLORIDE (TONS)	DTS- SOLVED SULFATE (MG/L)	DTS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	2862.84	1860	1070	8280	440	3370	140	1060	290
NOV. 1976.....	231.93	6090	3720	2330	1580	990	730	456	750
DEC. 1976.....	134.04	8930	5510	1990	2310	834	1420	514	1050
JAN. 1977.....	177.82	8880	5480	2630	2290	1100	1410	677	1050
FEB. 1977.....	113.94	8400	5160	1590	2170	667	1280	395	990
MAR. 1977.....	76.71	8420	5180	1070	2170	451	1290	268	1000
APR. 1977.....	1249.4	3310	1950	6560	840	2830	290	985	450
MAY 1977.....	697.66	2920	1700	3200	730	1370	270	515	400
JUNE 1977.....	617.51	1780	1010	1690	420	699	140	231	280
JULY 1977.....	207.11	3350	1990	1110	860	481	260	142	450
AUG. 1977.....	3745.15	869	490	4940	170	1700	64	652	180
SEPT 1977.....	32.43	8710	5400	473	2260	198	1370	120	1030
TOTAL .....	10146.53	**	**	35900	**	14700	**	6010	**
WTD.AVG. ....	27.8	2230	1300	**	540	**	220	**	330

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5350	3780	8410	9810	8370	8230	8800	6340	3340	4860	4740	4560
2	5340	4500	8340	9500	8470	8400	8920	8830	3350	4950	4870	5670
3	5320	4830	8370	9380	8580	8610	9120	7540	3990	5420	5050	5350
4	5150	5120	8580	9170	8730	8780	9270	6310	4000	6070	5230	6880
5	1540	5750	8480	9550	8370	9000	9250	6350	4350	6510	5550	8410
6	844	6050	8880	9290	8730	9180	9230	6380	4630	6900	6740	8370
7	2640	6270	11300	9380	8690	9340	9320	6410	5040	7240	6100	10700
8	3120	6830	9410	9290	8850	9560	9440	6440	5380	7300	---	10500
9	3170	7260	8840	8540	9000	9620	9530	6720	6010	7670	---	10900
10	3360	7470	8880	9950	9580	9900	9580	2070	6070	7840	---	11400
11	3510	7650	8800	9740	8690	10300	9620	1540	6360	7920	---	11700
12	4340	7850	8810	9460	8660	9950	11300	2820	6680	8130	7710	12000
13	4870	7760	8630	9420	8620	10600	12700	4260	6540	8350	7690	12100
14	5880	7550	8420	9610	8610	10300	10500	5380	6420	8770	7940	12200
15	6460	7460	8220	9460	8080	10700	6390	7230	6800	9120	8120	12400
16	6150	7260	8230	9420	8110	11000	2600	7450	7600	9340	8410	12500
17	7000	7310	8250	8050	8140	11300	2620	7630	---	9520	8680	12500
18	7100	7280	8160	8180	8310	11600	2770	7770	---	10000	8850	12600
19	7120	7200	8120	8300	8240	11700	3220	7900	---	10400	9070	12800
20	7380	7510	8080	8240	8180	11900	3560	6500	---	---	8080	12900
21	7350	7760	8050	8330	8110	12200	2570	2010	9290	---	7730	13000
22	7510	7700	8290	9420	8170	12300	2350	2430	8550	9950	7700	12800
23	7620	7950	7760	8430	8660	12800	2510	2440	1520	3970	7940	12900
24	7980	7890	7840	8400	8550	12900	2750	3490	1350	2140	7790	12800
25	8320	7920	8050	8300	8340	12400	3280	4180	2060	2560	7950	12500
26	8600	7950	9500	8110	8200	10500	3810	4930	2270	2790	8330	12600
27	8740	8100	10500	8080	8160	10200	4360	5450	3080	2840	9070	12700
28	4500	8420	10000	8240	8110	8280	4850	5910	3110	3210	1030	12500
29	3030	8530	9760	8330	---	7480	5400	6080	3900	3600	614	12600
30	2750	8600	9580	8940	---	8420	5860	6250	4380	3920	1350	12700
31	3850	---	9760	8330	---	8490	---	6430	---	4240	3440	---
MEAN	5350	7120	8780	8920	8480	10200	6520	5530	4850	6400	6510	11100

## COLORADO RIVER BASIN

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08121000 COLORADO RIVER AT COLORADO CITY, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.0	17.0	8.0	4.0	12.0	---	24.0	29.0	31.0	32.0	26.5	23.5
2	20.0	11.0	3.0	7.0	7.0	---	24.0	29.0	31.0	34.0	27.0	24.0
3	28.0	12.0	14.0	2.0	12.0	---	20.0	27.0	32.5	34.0	28.0	24.0
4	28.0	12.0	3.0	10.0	3.0	---	18.0	27.0	33.0	33.0	28.0	28.0
5	17.0	17.0	10.0	3.0	3.0	---	20.0	25.0	34.5	32.0	29.5	28.5
6	20.0	20.0	6.0	7.0	16.0	---	22.0	22.5	31.0	29.0	29.5	28.0
7	15.0	20.0	8.0	2.0	15.0	---	20.0	22.0	28.0	30.0	30.0	29.5
8	15.0	8.0	4.0	8.0	5.0	17.0	22.0	27.5	28.5	29.0	---	31.5
9	17.0	19.0	7.0	2.0	15.0	18.0	22.0	28.0	32.0	34.0	---	33.5
10	20.0	19.0	8.0	4.0	8.0	19.0	20.0	23.0	33.0	35.0	---	34.0
11	15.0	11.0	3.0	5.0	16.0	12.0	18.0	21.0	33.0	35.0	---	31.0
12	21.0	4.0	12.0	5.0	7.0	18.0	18.0	22.0	31.0	33.0	31.0	32.0
13	22.0	4.0	13.0	4.0	6.0	17.0	19.0	24.5	33.0	35.0	29.0	31.5
14	21.0	4.0	7.0	8.0	12.0	22.0	20.0	22.0	32.5	35.0	28.5	31.0
15	22.0	5.0	11.0	4.0	14.0	21.0	17.0	24.0	33.0	35.0	28.0	32.0
16	12.0	2.0	5.0	3.0	16.0	17.0	17.0	24.0	34.0	36.0	34.0	30.5
17	20.0	10.0	10.0	5.0	17.0	21.0	16.0	25.0	---	33.0	34.0	33.0
18	23.0	8.0	6.0	7.0	10.0	23.0	18.0	27.0	---	35.0	34.5	33.0
19	10.0	15.0	16.0	3.0	10.0	21.0	19.0	26.0	---	36.0	34.5	34.0
20	20.0	9.0	4.0	8.0	20.0	17.0	17.0	25.0	---	---	33.5	33.0
21	16.0	8.0	6.0	4.0	13.0	18.0	15.0	24.0	34.0	---	28.5	31.0
22	18.0	7.0	2.0	4.0	18.0	22.0	18.0	25.0	29.0	33.0	28.0	33.0
23	12.0	13.0	9.0	8.0	13.0	20.0	18.0	26.0	27.5	34.0	34.5	33.0
24	16.0	8.0	---	11.0	9.0	21.0	18.0	27.5	31.0	30.0	33.0	31.5
25	18.0	14.0	---	2.0	15.0	19.0	18.0	25.0	31.0	32.0	33.0	31.0
26	18.0	9.0	---	13.0	8.0	19.0	22.0	26.5	32.5	34.0	33.0	28.5
27	12.0	4.0	12.0	4.0	12.0	18.0	24.0	28.0	34.0	33.0	31.0	31.0
28	8.0	5.0	4.0	7.0	15.0	17.0	26.0	30.0	32.5	33.0	30.0	28.5
29	10.0	5.0	10.0	2.0	---	20.0	25.0	34.5	34.0	29.0	25.0	29.5
30	11.0	2.0	5.0	2.0	---	22.0	28.0	34.0	33.0	29.0	24.5	28.0
31	18.0	---	5.0	5.0	---	17.0	---	34.0	---	29.0	25.0	---
MEAN	17.5	10.0	7.5	5.5	11.5	19.0	20.0	26.5	32.0	33.0	30.0	30.5



## COLORADO RIVER BASIN

## 08123000 LAKE COLORADO CITY NEAR COLORADO CITY, TX

LOCATION.--Lat 32°20'41", long 100°55'10", Mitchell County, Hydrologic Unit 12080002, on left bank at municipal water-intake structure, 1.7 mi (2.7 km) upstream from Colorado City Dam on Morgan Creek, 2.2 mi (3.5 km) downstream from the Texas and Pacific Railway Co. bridge, 2.5 mi (4.0 km) upstream from mouth, and 4.0 mi (6.4 km) southwest of Colorado City.

DRAINAGE AREA.--322 mi<sup>2</sup> (834 km<sup>2</sup>), of which 32 mi<sup>2</sup> (83 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1949 to current year.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Prior to Aug. 23, 1950, nonrecording gages at or near powerplant about 0.7 mi (1.1 km) downstream at same datum.

REMARKS.--The lake is formed by a rolled earthfill dam 4,800 ft (1,460 m) long. Storage began in April 1949, and the dam was completed in September 1949. The dam and lake are owned and operated by Texas Electric Service Co. in the operation of their thermal electric powerplant. The uncontrolled emergency spillway is an excavated cut channel through natural ground 1,200 ft (366 m) wide located 600 ft (180 m) upstream and to the left of left end of dam. The spillway is designed to discharge 150,000 ft<sup>3</sup>/s (4,250 m<sup>3</sup>/s) at the maximum design flood elevation. The service spillway is an uncontrolled rectangular drop inlet located 100 ft (30 m) upstream from dam with two uncontrolled openings of 10.0 by 12.0 ft (3.0 by 3.7 m), which is designed for a maximum discharge of 5,000 ft<sup>3</sup>/s (142 m<sup>3</sup>/s). A service outlet is provided for small releases downstream through a 30-inch (762-millimeter) valve-controlled concrete pipe. Records furnished by the Texas Electric Service Co. indicate that 1,070 acre-ft (1.32 hm<sup>3</sup>) was pumped from Champion Creek Reservoir (station 08123600) into Lake Colorado City during the current year. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	2,090.0	-
Design flood.....	2,086.7	70,700
Crest of spillway.....	2,073.7	37,850
Crest of service spillway (top of conservation pool).....	2,070.2	31,640
Lowest gated outlet (invert).....	2,024.3	316

COOPERATION.--Capacity curve furnished by Texas Electric Service Co. Record of diversions for municipal use furnished by city of Colorado City.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 40,280 acre-ft (49.7 hm<sup>3</sup>) Sept. 7, 1962, elevation, 2,075.10 ft (632.490 m); minimum since first appreciable storage, 5,800 acre-ft (7.15 hm<sup>3</sup>) Apr. 11-13, 1950, elevation, 2,045.72 ft (623.536 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 21,080 acre-ft (26.0 hm<sup>3</sup>) Nov. 2, 3, elevation, 2,062.63 ft (628.690 m); minimum, 14,520 acre-ft (17.9 hm<sup>3</sup>) Sept. 23, 30, elevation, 2,056.72 ft (626.888 m).

Capacity table (elevation, in feet, and total contents, in acre-feet)

2,056.0	13,820
2,059.0	16,880
2,063.0	21,540

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20840	21070	20750	20250	19920	19590	18670	18610	18250	17750	16480	15610
2	20810	21080	20740	20240	19910	19590	18650	18590	18240	17750	16440	15510
3	20780	21080	20720	20220	19900	19470	18610	18550	18190	17750	16390	15400
4	20870	21070	20720	20210	19890	19360	18550	18520	18150	17640	16360	15350
5	20860	21040	20710	20190	19880	19360	18520	18530	18100	17640	16330	15300
6	20910	21030	20700	20180	19860	19360	18500	18510	18060	17530	16320	15300
7	20920	21000	20670	20180	19850	19360	18460	18490	18010	17480	16310	15300
8	20890	20980	20660	20180	19840	19300	18440	18460	17960	17370	16290	15270
9	20880	20990	20650	20150	19830	19300	18410	18500	17900	17370	16260	15220
10	20860	20980	20640	20140	19830	19240	18360	18600	17830	17370	16250	15180
11	20830	20980	20630	20130	19830	19120	18330	18650	17800	17310	16250	15130
12	20800	20970	20610	20140	19830	19060	18320	18620	17810	17310	16200	15070
13	20780	20960	20580	20140	19830	19000	18280	18590	17770	17200	16160	15010
14	20760	20960	20580	20140	19830	19000	18450	18550	17720	17150	16130	14950
15	20740	20940	20560	20120	19830	19000	18460	18520	17690	17040	16130	14890
16	20690	20940	20540	20100	19830	19000	18660	18470	17620	16990	16030	14840
17	20660	20940	20530	20090	19830	19000	18690	18430	17540	16990	16030	14780
18	20630	20920	20520	20070	19830	19000	18700	18400	17480	16880	15970	14750
19	20560	20920	20500	20060	19770	19000	18770	18360	17420	16770	15970	14700
20	20550	20910	20490	20040	19770	19000	18840	18430	17360	16660	15970	14650
21	20520	20890	20480	20030	19770	18950	18830	18400	17370	16610	15920	14610
22	20480	20880	20450	20060	19710	18950	18830	18360	17400	16610	15820	14560
23	20470	20860	20440	20070	19710	18830	18810	18330	17370	16560	15820	14520
24	20450	20860	20430	20060	19590	18720	18790	18280	17450	16560	15710	14540
25	20430	20860	20410	20040	19590	18690	18760	18250	17400	16560	15710	14530
26	20390	20840	20390	20030	19590	18810	18740	18230	17800	16560	15610	14540
27	20500	20800	20380	20020	19590	18830	18700	18200	17800	16560	15610	14540
28	20650	20780	20360	19980	19590	18770	18680	18160	17750	16530	15610	14530
29	20810	20770	20340	19960	---	18740	18660	18110	17750	16580	15820	14540
30	21040	20760	20300	19950	---	18720	18640	18080	17750	16560	15820	14520
31	21070	---	20270	19940	---	18690	---	18030	---	16540	15710	---
(†)	2062.62	2062.37	2061.97	2061.69	2061.40	2060.63	2060.58	2060.05	2059.80	2058.69	2057.90	2056.72
(+)	+200	-310	-490	-330	-350	-900	-50	-610	-280	-1210	-830	-1190
(††)	74	77	82	84	79	114	101	126	182	218	220	167
MAX	21070	21080	20750	20250	19920	19590	18840	18650	18250	17750	16480	15610
MIN	20390	20760	20270	19940	19590	18690	18280	18030	17360	16530	15610	14520
CAL YR 1976	MAX	25220	MIN	20270	+	-4960	††	1330				
WTR YR 1977	MAX	21080	MIN	14520	+	-6350	††	1520				

† Elevation, in feet, at end of month.

+ Change in contents, in acre-feet.

†† Diversions, in acre-feet, for municipal use.

COLORADO RIVER BASIN

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08123000 LAKE COLORADO CITY NEAR COLORADO CITY, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)
DEC 30...	1015	2050	8.3	12.0	480	340	96

DATE	DIS-SOLVED MAGNESIUM (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DIS-SOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)
DEC 30...	59	260	5.2	20	180	0

## 08123600 CHAMPION CREEK RESERVOIR NEAR COLORADO CITY, TX

LOCATION.--Lat 32°16'53", long 100°51'30", Mitchell County, Hydrologic Unit 12080002, in service outlet structure at Champion Creek Dam on Champion Creek, 0.9 mi (1.4 km) upstream from mouth, 4.8 mi (7.7 km) downstream from State Highway 208, and 7.2 mi (11.6 km) south of Colorado City.

DRAINAGE AREA.--203 mi<sup>2</sup> (526 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1959 to current year.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Prior to Sept. 29, 1959, nonrecording gage at same site and datum.

REMARKS.--The reservoir is formed by a rolled earthfill dam about 6,800 ft (2,070 m) long. The dam was completed on Apr. 30, 1959. Closure and storage began in February 1959. Capacity curve is based on Geological Survey topographic map surveyed in 1950; excavation for borrow, estimated not to exceed 1,200 acre-ft (1.23 hm<sup>3</sup>), is not included. The dam and reservoir are owned and operated by Texas Electric Service Co. Water may be pumped from the reservoir through a 24-inch (610 mm) pipeline to Lake Colorado City (station 08123000) for municipal use and for cooling operations of a steam generating powerplant. There are two spillways. The emergency spillway, 450 ft (137 m) wide by 1,800 ft (549 m) long, is located at the right end of dam. The service spillway, a cut channel 50 ft (15 m) wide, about 1,800 ft (549 m) long, and 8 ft (2 m) deep, is cut into the emergency spillway at the extreme right end. There is a controlled drop-inlet structure, 4.0 by 5.0 ft (1.2 by 1.5 m), with a side opening of 1.5 by 3.0 ft (0.5 by 0.9 m). Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	2,109.0	—
Design flood.....	2,104.1	90,020
Crest of spillway.....	2,091.0	56,800
Crest of spillway (top of conservation pool).....	2,083.0	42,500
Lowest gated opening (invert).....	2,020.0	880

COOPERATION.--Record of diversions into Lake Colorado City furnished by Texas Electric Service Co.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 27,910 acre-ft (34.4 hm<sup>3</sup>) June 19, 1966, elevation, 2,071.98 ft (631.540 m); minimum, 1,600 acre-ft (1.97 hm<sup>3</sup>) Oct. 1, 1959, elevation, 2,025.90 ft (617.494 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 17,510 acre-ft (21.6 hm<sup>3</sup>) Aug. 30, 31, elevation, 2,061.18 ft (628.248 m); minimum, 13,690 acre-ft (16.9 hm<sup>3</sup>) Aug. 27, elevation, 2,056.19 ft (626.727 m).

Capacity table (elevation, in feet, and total contents, in acre-feet)

2,056.0	13,560
2,059.0	15,780
2,062.0	18,180

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14380	14760	14790	14810	14930	14960	14960	15300	15330	15090	14420	17500
2	14370	14760	14790	14800	14940	14960	14960	15290	15370	15070	14420	17490
3	14360	14760	14810	14810	14940	14960	14960	15280	15370	15050	14360	17480
4	14560	14760	14810	14820	14950	14960	14940	15280	15360	15020	14280	17470
5	14670	14760	14810	14810	14950	14950	14930	15300	15340	15000	14220	17460
6	14670	14760	14810	14810	14960	14940	14930	15300	15330	14990	14150	17450
7	14670	14750	14810	14810	14960	14940	14920	15300	15300	14960	14090	17440
8	14660	14740	14810	14840	14960	14940	14910	15300	15290	15000	14030	17430
9	14660	14750	14810	14830	14970	14940	14910	15300	15270	14990	13970	17430
10	14660	14750	14820	14820	14980	14940	14900	15300	15240	14980	13910	17410
11	14650	14750	14820	14830	14980	14930	14900	15300	15230	14960	13870	17390
12	14640	14770	14820	14840	15010	14930	14900	15290	15230	14930	13860	17430
13	14640	14770	14820	14850	15010	14920	14900	15280	15230	14900	13850	17410
14	14640	14770	14820	14850	15010	14920	15030	15270	15200	14880	13840	17400
15	14640	14770	14820	14850	15010	14920	15050	15270	15190	14870	13830	17380
16	14620	14770	14830	14850	15000	14910	15120	15260	15160	14850	13810	17360
17	14610	14780	14830	14850	15010	14910	15140	15250	15120	14840	13800	17340
18	14610	14790	14840	14850	15010	14910	15230	15240	15100	14820	13780	17340
19	14590	14810	14860	14860	15010	14900	15290	15230	15080	14790	13770	17310
20	14580	14820	14830	14870	15010	14890	15300	15270	15050	14780	13770	17300
21	14570	14810	14830	14870	15010	14880	15310	15340	15130	14760	13780	17280
22	14560	14800	14830	14890	15010	14870	15300	15340	15170	14760	13780	17260
23	14570	14810	14830	14900	15010	14870	15310	15340	15200	14740	13770	17220
24	14570	14820	14830	14900	14990	14860	15300	15330	15200	14730	13760	17180
25	14570	14830	14840	14910	14990	14860	15300	15320	15180	14700	13740	17120
26	14560	14840	14840	14920	14980	14970	15300	15310	15180	14670	13720	17060
27	14620	14820	14840	14930	14970	14990	15300	15300	15160	14640	13710	17010
28	14700	14790	14840	14920	14960	14980	15300	15300	15150	14590	13730	16940
29	14740	14790	14840	14910	---	14980	15300	15290	15130	14560	17480	16880
30	14750	14790	14830	14920	---	14980	15300	15270	15120	14510	17510	16820
31	14760	---	14820	14930	---	14960	---	15250	---	14450	17510	---
(†)	2057.67	2057.72	2057.75	2057.90	2057.95	2057.95	2058.38	2058.35	2058.15	2057.25	2061.18	2060.32
(*)	+380	+30	+30	+110	+30	0	+340	-50	-130	-670	+3060	-690
(††)	0	0	0	0	0	0	0	0	0	169	572	329
MAX	14760	14840	14860	14930	15010	14990	15310	15340	15370	15090	17510	17500
MIN	14360	14740	14790	14800	14930	14860	14900	15230	15050	14450	13710	16820
CAL YR 1976.....	* +2750			†† 28		MAX 14860		MIN 11780				
WTR YR 1977.....	* +2440			†† 1070		MAX 17510		MIN 13710				

† Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

†† Diversions, in acre-feet, into Lake Colorado City.

COLORADO RIVER BASIN

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08123600 CHAMPION CREEK RESERVOIR NEAR COLORADO CITY, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)
NOV 18...	1000	983	8.2	11.0	360	220	78	39	64
DATE	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SIO2) (MG/L)	DIS- SOLVED (SUM OF CONSTI- TUENTS) (MG/L)
NOV 18...	1.5	9.2	169	0	270	73	.5	3.1	620



## COLORADO RIVER BASIN

08123650 BEALS CREEK ABOVE BIG SPRING, TX

LOCATION.--Lat 32°15'01", long 101°29'26", Howard County, Hydrologic Unit 12080007, on left bank at end of Channing Street in Big Spring, just downstream from Onemile Lake, 2.9 mi (4.7 km) upstream from Little Sandy Creek, 7.5 mi (12.1 km) downstream from confluence of Sulphur Springs Creek and Mustang Draw, and 71.1 mi (114.4 km) upstream from mouth.

DRAINAGE AREA.--9,409 mi<sup>2</sup> (24,369 km<sup>2</sup>), of which 8,915 mi<sup>2</sup> (23,090 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1959 to current year.

REVISED RECORDS.--WSP 1732: 1959(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 2,400.02 ft (731.526 m) above mean sea level.

REMARKS.--Water-discharge records good. Runoff from contributing drainage area is largely regulated by several natural salt lakes. Records of diversions from Threemile and Fourmile Lakes (natural lakes upstream from gage on Beals Creek) into Natural Salt Lake (natural lake on Sulphur Springs) 7.0 mi (11.3 km) upstream from gage were furnished by the Colorado River Municipal Water District.

AVERAGE DISCHARGE.--18 years (water years 1960-77), 1.19 ft<sup>3</sup>/s (0.0337 m<sup>3</sup>/s), 862 acre-ft/yr (1.06 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 255 ft<sup>3</sup>/s (7.22 m<sup>3</sup>/s) Sept. 6, 1962, gage height, 5.95 ft (1.814 m); no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 10, 1957, was highest known since 1932, from comparison of floods at a point 4 mi (6 km) downstream, from information by City Engineering Department. Flood of June 12, 1938, reached a stage of about 7.6 ft (2.32 m) at present site and datum, from information by Texas and Pacific Railway Co.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 47 ft<sup>3</sup>/s (1.33 m<sup>3</sup>/s) Apr. 14, gage height, 2.66 ft (0.811 m); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.13	.09	.22	.01	.09	.64	.00	.96	.00	.00
2	.00	.00	.13	.13	.22	.05	.06	.58	.00	.77	.00	.00
3	.00	.00	.14	.15	.25	.03	.09	.50	.00	.59	.00	.00
4	.00	.00	.15	.16	.22	.01	.05	.47	.00	.36	.00	.00
5	.00	.00	.15	.09	.20	.01	.02	.42	.00	.05	.00	.00
6	.00	.00	.17	.14	.20	.01	.01	.44	.00	.04	.00	.00
7	.00	.00	.17	.12	.18	.01	.01	.36	.00	.03	.00	.00
8	.00	.02	.15	.11	.20	.01	.00	.33	.00	.03	.00	.00
9	.00	.04	.15	.20	.19	.00	.00	.33	.00	.05	.00	.00
10	.00	.04	.12	.17	.21	.02	.00	.24	.00	.04	.00	.00
11	.00	.04	.09	.17	.39	.02	.00	.23	.00	.02	.00	.00
12	.00	.02	.09	.21	.36	.00	.00	.19	.00	.01	.00	.00
13	.00	.07	.09	.30	.34	.00	.00	.15	.00	.00	.00	.00
14	.00	.17	.11	.31	.29	.00	13	.13	.00	.00	.00	.00
15	.00	.20	.13	.31	.29	.00	31	.10	.00	.00	.00	.00
16	.00	.20	.13	.27	.27	.00	14	.06	.00	.00	.00	.00
17	.00	.20	.13	.30	.26	.01	9.7	.04	.00	.00	.00	.00
18	.00	.17	.14	.27	.22	.00	5.6	.03	.00	.00	.00	.00
19	.00	.06	.15	.27	.17	.00	3.7	.02	.00	.00	.00	.00
20	.00	.06	.13	.26	.19	.00	3.1	.02	.00	.00	.00	.00
21	.00	.04	.11	.25	.16	.00	2.2	.03	.00	.00	.00	.00
22	.00	.04	.12	.30	.25	.00	1.8	.01	.00	.01	.00	.00
23	.00	.04	.11	.36	.38	.00	1.4	.01	.00	.03	.00	.00
24	.00	.04	.12	.36	.05	.00	1.2	.00	.00	.03	.00	.00
25	.00	.05	.13	.36	.04	.00	1.0	.00	.93	.03	.00	.00
26	.00	.18	.13	.38	.04	.00	.91	.00	3.0	.04	.00	.00
27	.00	.10	.15	.37	.04	.20	.77	.00	2.5	.03	.00	.00
28	.00	.11	.16	.23	.03	.24	.67	.00	1.9	.02	.00	.00
29	.00	.11	.15	.20	---	.18	.61	.00	1.5	.01	.00	.00
30	.00	.11	.15	.20	---	.09	.70	.00	1.2	.02	.00	.00
31	.00	---	.12	.22	---	.07	---	.00	---	.01	.00	---
TOTAL	.00	2.11	4.10	7.26	5.86	.97	91.69	5.33	11.03	3.18	.00	.00
MEAN	.000	.070	.13	.23	.21	.031	3.06	.17	.37	.10	.000	.000
MAX	.00	.20	.17	.38	.39	.24	31	.64	3.0	.96	.00	.00
MIN	.00	.00	.09	.09	.03	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	4.2	8.1	14	12	1.9	182	11	22	6.3	.00	.00
(†)	0	32	0	30	28	47	46	38	9.0	0	0	0

CAL YR 1976 TOTAL 247.84 MEAN .68 MAX 87 MIN .00 AC-FT 492 † 847  
WTR YR 1977 TOTAL 131.53 MEAN .36 MAX 31 MIN .00 AC-FT 261 † 230

† Diversions, in acre-feet, from creek for brine disposal by Colorado River Municipal Water District.

COLORADO RIVER BASIN

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08123650 BEALS CREEK ABOVE BIG SPRING, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: April 1973 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1973 to current year.

WATER TEMPERATURES: April 1973 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 74,000 micromhos May 9, 1974; minimum daily, 2,800 micromhos May 23, 1975.

WATER TEMPERATURES: Maximum daily, 36.0°C July 9, 30, 1977; minimum daily, 0.0°C Dec. 31, 1976, Jan. 9, 29, 1977.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 50,400 micromhos Apr. 7; minimum daily, 8,670 micromhos Apr. 16.

WATER TEMPERATURES: Maximum daily, 36.0°C July 9, 30; minimum daily, 0.0°C Dec. 31, Jan. 9, 29.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)
DATE	TIME								
OCT 29...	0900	.07	39800	7.5	7.0	10000	9900	720	2000
DEC 29...	1425	.19	42100	7.3	7.0	11000	11000	780	2200
MAR 02...	1200	.03	45000	7.4	16.0	12000	11000	860	2300
APR 01...	1210	.07	47500	7.6	20.0	12000	12000	870	2400
MAY 04...	1520	.38	34900	7.4	25.0	8400	8400	580	1700
JUN 26...	1030	3.3	11400	7.6	25.0	1300	1200	210	180
JUL 01...	1300	.90	32100	7.5	32.0	8100	8000	610	1600
AUG 01...	1725	.01	43900	6.9	34.0	11000	11000	790	2200
DATE	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)
OCT 29...	7400	32	200	188	0	8300	12000	.5	30700
DEC 29...	8500	35	250	224	0	8900	15000	.2	35700
MAR 02...	8700	35	190	200	0	9400	14000	.7	35500
APR 01...	8700	34	210	250	0	9500	15000	.3	36800
MAY 04...	6500	31	140	110	0	8500	10000	.6	27500
JUN 26...	2000	24	50	100	0	2000	2600	5.1	7090
JUL 01...	4600	22	140	97	0	5800	8300	.3	21100
AUG 01...	8300	34	220	110	0	8900	14000	--	--

## COLORADO RIVER BASIN

08123650 BEALS CREEK ABOVE BIG SPRING, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	0	*****	*****	0	*****	0	*****	0	****
NOV. 1976.....	2.11	40600	32200	183	12900	74	8460	48	****
DEC. 1976.....	4.1	41500	33000	365	13200	146	8670	96	****
JAN. 1977.....	7.26	41800	33200	651	13300	260	8730	171	****
FEB. 1977.....	5.86	42200	33600	532	13400	213	8820	140	****
MAR. 1977.....	0.97	45700	36700	96	14600	38	9620	25	****
APR. 1977.....	91.69	17000	11800	2930	4880	1210	3100	767	****
MAY 1977.....	5.33	35000	27200	391	11000	158	7190	103	****
JUNE 1977.....	11.03	19800	14000	417	5830	174	3710	110	****
JULY 1977.....	3.18	37600	29500	253	11900	102	7770	67	****
AUG. 1977.....	0	*****	*****	0	*****	0	*****	0	****
SEPT 1977.....	0	*****	*****	0	*****	0	*****	0	****
TOTAL .....	131.53	**	**	5820	**	2370	**	1530	**
WTD.AVG. ....	0.36	22300	16000	**	6700	**	4300	**	****

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		---	41100	42600	41900	45000	47600	34200	---	31900		
2		---	41400	42700	42000	45200	48400	34500	---	38400		
3		---	41200	42500	41800	45900	48200	34700	---	41500		
4		---	41300	42500	42000	46200	48900	34700	---	40900		
5		---	41300	42700	42000	46200	49300	34800	---	40500		
6		---	41500	42600	42100	46200	50000	34900	---	39800		
7		---	40600	42700	42000	46500	50400	34800	---	39300		
8		41200	41100	42800	42000	46900	---	34900	---	38700		
9		41500	41300	42400	42100	---	---	35100	---	38400		
10		41600	41200	41300	42000	47600	---	35600	---	38300		
11		41600	41500	41700	41400	47600	---	35600	---	38400		
12		41800	41600	42800	41700	---	---	35700	---	39100		
13		40400	41600	38500	41800	---	---	35900	---	---		
14		41000	41300	42300	41800	---	30000	36100	---	---		
15		40000	41300	41900	42000	---	10600	36800	---	---		
16		40400	41400	42100	42100	---	8670	37100	---	---		
17		40500	41500	42300	42100	48200	11000	37100	---	---		
18		40400	41600	42100	42200	---	15000	37300	---	---		
19		40600	41400	42100	42300	---	24400	37500	---	---		
20		40400	41500	41700	42700	---	26400	37900	---	---		
21		40400	41600	42100	42600	---	25500	37500	---	---		
22		40600	41700	41800	43800	---	27000	38300	---	39000		
23		40800	41800	40900	42900	---	27800	38800	---	40900		
24		40700	41800	41200	44300	---	28300	---	---	42300		
25		40800	41900	41400	44300	---	35100	---	35200	42400		
26		40600	41800	41500	44500	---	32700	---	11400	42600		
27		40800	42000	41600	44500	44500	34500	---	16000	41100		
28		41200	42200	41700	44800	44300	34300	---	20300	41900		
29		41400	42100	41700	---	46900	34500	---	22100	38100		
30		39400	42200	41800	---	47200	33900	---	33200	41000		
31		---	42100	41900	---	47300	---	---	---	41500		
MEAN		40800	41500	41900	42600	46400	32600	36100	23000	39800		

COLORADO RIVER BASIN

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08123650 BEALS CREEK ABOVE BIG SPRING, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		---	4.0	1.0	0.5	12.0	20.0	21.0	---	32.0		
2		---	7.0	1.0	5.0	16.0	23.0	28.0	---	32.0		
3		---	12.0	10.0	8.0	12.0	13.0	28.0	---	32.0		
4		---	3.0	10.0	8.0	14.0	18.0	28.0	---	---		
5		---	6.0	4.0	13.0	4.0	20.0	26.0	---	---		
6		---	5.0	6.0	5.0	2.0	21.0	27.0	---	---		
7		---	5.0	7.0	7.0	15.0	22.0	21.0	---	---		
8		14.0	8.0	6.0	9.0	15.0	---	22.0	---	26.0		
9		16.0	3.0	0.0	11.0	---	---	29.0	---	36.0		
10		18.0	6.0	4.0	9.0	---	---	26.0	---	25.0		
11		12.0	3.0	7.0	13.0	---	---	27.0	---	31.0		
12		5.0	2.0	3.0	8.0	---	---	22.0	---	29.0		
13		4.0	4.0	9.0	18.0	---	---	26.0	---	---		
14		3.0	4.0	6.0	15.0	---	---	26.0	---	---		
15		5.0	11.0	4.0	13.0	---	9.0	27.0	---	---		
16		4.0	12.0	1.0	13.0	---	6.0	29.0	---	---		
17		7.0	11.0	4.0	17.0	---	5.0	26.0	---	---		
18		12.0	6.0	5.0	16.0	---	22.0	27.0	---	---		
19		15.0	6.0	7.0	9.0	---	19.0	26.0	---	---		
20		11.0	9.0	9.0	7.0	---	19.0	26.0	---	---		
21		9.0	6.0	8.0	8.0	---	17.0	27.0	---	---		
22		9.0	13.0	5.0	16.0	---	15.0	19.0	---	27.0		
23		11.0	9.0	5.0	8.0	---	18.0	28.0	---	24.0		
24		12.0	3.0	7.0	13.0	---	26.0	---	---	25.0		
25		11.0	5.0	10.0	13.0	---	27.0	---	---	31.0		
26		14.0	4.0	9.0	7.0	---	23.0	---	25.0	32.0		
27		8.0	3.0	10.0	4.0	---	25.5	---	29.0	31.0		
28		1.0	4.0	9.0	11.0	18.0	25.0	---	29.0	34.0		
29		3.0	2.0	0.0	---	---	24.0	---	29.0	32.0		
30		5.0	5.0	3.0	---	20.0	19.0	---	32.0	36.0		
31		---	0.0	3.0	---	15.0	---	---	---	26.0		
MEAN		9.0	6.0	5.5	10.0	13.0	19.0	25.5	29.0	30.0		

## COLORADO RIVER BASIN

08123800 BEALS CREEK NEAR WESTBROOK, TX  
(National stream-quality accounting network)

LOCATION.--Lat 32°11'57", long 101°00'49", Mitchell County, Hydrologic Unit 12080007, on left bank at downstream side of bridge on State Highway 163, 2.1 mi (3.4 km) downstream from Hackberry Creek, 10.8 mi (17.4 km) south of Westbrook, 15.7 mi (25.3 km) southwest of Colorado City, and 19.9 mi (32.0 km) upstream from mouth.

DRAINAGE AREA.--9,903 mi<sup>2</sup> (25,648 km<sup>2</sup>), of which 8,930 mi<sup>2</sup> (23,130 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1958 to current year.

REVISED RECORDS.--WDR TX-72: 1971.

GAGE.--Water-stage recorder. Datum of gage is 2,048.74 ft (624.456 m) above mean sea level.

REMARKS.--Water-discharge records good. Low flow is affected by diversion upstream from station, see station 08123650.

AVERAGE DISCHARGE.--19 years, 23.8 ft<sup>3</sup>/s (0.674 m<sup>3</sup>/s), 0.33 in/yr (8 mm/yr), 17,240 acre-ft/yr (21.3 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,780 ft<sup>3</sup>/s (249 m<sup>3</sup>/s) May 19, 1961, gage height, 21.65 ft (6.599 m); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1908, about 24.5 ft (7.47 m) in 1922, from information by local resident.

EXTREMES FOR CURRENT YEAR.-- Maximum discharge, 588 ft<sup>3</sup>/s (16.7 m<sup>3</sup>/s) June 26, gage height, 7.01 ft (2.137 m), no peak above base of 900 ft<sup>3</sup>/s (25.5 m<sup>3</sup>/s); minimum, 0.34 ft<sup>3</sup>/s (0.010 m<sup>3</sup>/s) June 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.3	7.8	4.1	5.0	6.4	5.2	4.7	8.9	52	6.8	5.2	6.4
2	6.8	5.3	4.6	4.7	6.5	5.0	4.7	11	64	5.3	3.2	4.3
3	6.1	4.8	4.7	5.0	6.5	5.2	4.7	6.4	23	4.6	2.3	3.0
4	13	4.5	4.6	4.9	6.3	5.0	4.4	5.4	7.2	3.8	2.3	2.3
5	92	4.1	4.7	5.8	6.0	4.8	4.5	5.1	4.6	3.7	2.1	1.9
6	40	4.3	5.0	5.3	6.1	4.7	4.1	6.7	3.7	3.3	1.8	2.0
7	22	3.8	4.9	5.1	6.1	5.3	4.0	5.7	3.4	3.1	1.4	2.0
8	30	3.7	4.7	5.1	6.2	4.9	4.0	7.3	3.2	6.3	1.2	2.1
9	12	3.7	4.9	5.8	6.4	4.6	4.2	49	2.9	29	1.3	2.4
10	7.8	3.5	4.8	5.8	6.2	4.9	4.4	6.7	2.9	20	1.1	2.2
11	5.7	3.8	4.4	5.7	7.2	4.6	3.8	6.0	2.8	7.8	1.2	5.5
12	5.1	3.8	4.6	6.2	7.1	4.7	3.9	6.5	4.2	4.5	1.4	2.3
13	4.5	5.1	5.0	8.6	10	4.6	4.0	5.5	3.5	2.6	6.0	1.5
14	4.3	5.2	4.9	8.9	7.3	4.7	28	4.7	3.7	2.1	12	1.6
15	4.4	6.2	4.8	8.7	6.0	4.6	235	4.9	3.7	1.8	5.9	1.3
16	4.3	11	5.1	6.2	5.5	4.3	199	4.5	2.7	1.5	3.0	1.5
17	5.9	7.6	5.1	6.2	5.2	4.8	131	4.2	2.1	1.3	1.9	1.5
18	5.0	5.7	4.9	5.8	5.5	4.7	111	3.6	1.9	2.1	1.6	1.4
19	4.0	5.0	5.0	5.3	5.5	4.8	53	3.9	.88	1.9	1.3	1.1
20	4.2	5.0	5.1	5.6	5.5	4.3	205	4.0	.43	1.5	4.2	.93
21	4.1	4.6	4.9	5.6	5.5	4.0	54	58	1.6	22	7.4	1.3
22	4.2	4.7	4.8	6.0	5.3	4.0	14	49	10	196	3.5	1.1
23	4.4	4.6	5.0	6.4	5.3	3.9	9.3	12	28	173	2.3	1.2
24	4.6	4.4	5.2	7.1	5.1	4.0	8.1	7.0	59	115	2.1	1.1
25	4.7	4.8	5.1	5.6	4.6	3.9	7.4	4.8	178	17	2.1	1.1
26	4.6	4.7	5.3	7.3	4.7	8.2	6.9	4.5	394	8.1	1.8	1.1
27	6.0	4.3	5.2	6.7	5.1	34	6.6	4.3	200	4.9	1.3	1.1
28	16	4.1	5.0	6.8	5.2	32	6.5	4.0	34	3.7	24	1.1
29	287	4.2	5.0	5.9	---	16	6.0	3.7	13	5.8	20	1.0
30	98	4.1	4.9	6.1	---	7.1	6.3	3.4	8.8	4.9	51	1.1
31	22	---	5.0	5.9	---	5.1	---	3.0	---	3.3	20	---
TOTAL	741.0	148.4	151.3	189.1	168.3	217.9	1142.5	313.7	1119.21	666.7	195.9	58.43
MEAN	23.9	4.95	4.88	6.10	6.01	7.03	38.1	10.1	37.3	21.5	6.32	1.95
MAX	287	11	5.3	8.9	10	34	235	58	394	196	51	6.4
MIN	4.0	3.5	4.1	4.7	4.6	3.9	3.8	3.0	.43	1.3	1.1	.93
CFSM	.002	.000	.000	.001	.001	.001	.004	.001	.004	.002	.001	.000
IN.	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	1470	294	300	375	334	432	2270	622	2220	1320	389	116
CAL YR 1976	TOTAL	6154.31	MEAN 16.8	MAX 756	MIN .09	CFSM .002	IN .02	AC-FT 12210				
WTR YR 1977	TOTAL	5112.44	MEAN 14.0	MAX 394	MIN .43	CFSM .001	IN .02	AC-FT 10140				



COLORADO RIVER BASIN

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08123800 BEALS CREEK NEAR WESTBROOK, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD---Chemical analyses: November 1958 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1958 to current year.

WATER TEMPERATURES: November 1958 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 22,800 micromhos June 2, 1969; minimum daily, 219 micromhos Sept. 13, 1964.

WATER TEMPERATURES: Maximum daily, 37.0°C June 28, 1960, and July 3, 1976; minimum daily, 0.0°C Jan. 7, 1971, and Jan. 9, 1973.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 14,400 micromhos May 2; minimum daily, 907 micromhos July 23.

WATER TEMPERATURES: Maximum daily, 34.0°C May 29; minimum daily, 2.0°C Jan. 9, 17.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	RIO-CHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)
OCT 04...	1630	8.5	4180	9.0	24.0	70	8.7	106	7.2	22000	3000	3300
NOV 02...	0800	6.0	4460	8.0	10.5	45	8.3	78	2.3	9200	160	1900
DEC 06...	1430	5.5	11400	8.3	7.0	25	15.3	135	8.7	4	0	1100
JAN 04...	0845	4.5	10600	8.8	6.0	6	11.7	101	6.1	140	80	200
FEB 07...	1430	12	10900	8.8	9.5	10	10.7	101	12	70	30	700
MAR 14...	1530	8.5	11000	9.8	21.5	25	>19.3	>232	11	1100	92	580
APR 04...	1500	7.0	9580	9.7	19.0	20	>19.3	>222	13	680	12	800
MAY 02...	1640	9.0	14400	8.8	30.0	30	7.3	101	7.2	260	220	130
JUN 06...	1500	3.8	2800	8.8	30.5	30	13.2	178	7.0	5200	380	2000
JUL 11...	1520	6.4	9160	9.3	32.5	20	>19.2	>274	22	380	140	720
AUG 08...	1510	1.5	5200	8.8	32.5	30	10.3	145	5.4	140	84	130
SEP 30...	1700	85	4380	7.9	29.0	900	6.0	79	7.0	20000	4000	11000
SEP 09...	0910	2.4	3620	7.4	24.0	--	--	--	--	--	--	--

DATE	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 04...	920	790	170	120	580	8.3	16	118	22	600	1000	.6
NOV 02...	980	840	160	140	600	8.4	15	162	0	600	1100	.5
DEC 06...	2800	2500	410	420	1800	15	42	312	0	1900	3100	1.2
JAN 04...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 07...	2500	2300	360	380	1800	16	38	200	4	1800	3000	.7
MAR 14...	2500	2400	350	390	1900	17	42	42	20	1900	3000	.7
APR 04...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 02...	3200	3100	420	530	2200	17	30	176	22	2400	3800	.7
JUN 06...	790	640	150	100	500	7.8	16	150	13	530	920	.6
JUL 11...	2000	1800	280	310	1400	14	33	140	61	1400	2400	1.1
AUG 08...	1200	970	200	160	720	9.2	20	190	20	740	1200	.9
SEP 30...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 09...	810	640	160	99	460	7.0	21	210	0	530	800	.8

08123800 BEALS CREEK NEAR WESTBROOK, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS- SOLVED SILICA (SIO <sub>2</sub> ) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUS- PENDE SEDI- MENT (MG/L)	SUS- PENDE SEDI- MENT DIS- CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT 04...	1.5	2660	2570	.81	.19	.07	1.7	.61	7.4	212	4.9	68
NOV 02...	7.5	2890	2700	1.3	.06	.51	.99	.89	--	39	.63	99
DEC 06...	3.5	8050	7830	3.1	.29	1.5	2.6	3.4	--	27	.40	92
JAN 04...	--	--	--	1.4	.08	.02	1.6	1.3	--	4	.05	72
FEB 07...	19	7660	7500	.68	.08	1.2	3.8	2.4	12	13	.42	86
MAR 14...	7.3	7640	7630	.00	.12	.15	3.3	.61	--	20	.46	94
APR 04...	--	--	--	.00	.02	.16	4.0	.67	--	81	1.5	83
MAY 02...	.4	10200	9490	.00	.02	.15	1.4	.29	--	69	1.7	99
JUN 06...	9.3	2420	2310	.57	.22	.07	1.0	.90	14	51	.52	99
JUL 11...	.4	6360	5950	.00	.01	.07	2.9	.39	--	41	.71	85
AUG 08...	4.4	3490	3160	.01	.00	--	--	.24	11	35	.14	96
SEP 30...	--	--	--	1.0	.17	--	--	.66	--	1440	330	100
SEP 09...	6.7	--	2180	--	--	--	--	--	--	--	--	--

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)
OCT 04...	1630	5	4	--	200	0	2	20	10
FEB 07...	1430	3	3	--	200	0	4	10	2
JUN 06...	1500	10	10	--	200	<10	3	0	0
AUG 08...	1510	14	10	700	800	10	0	16	8

DATE	TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)
OCT 04...	0	--	7	2	1300	30	4	0	80
FEB 07...	1	1	4	3	400	20	2	0	1700
JUN 06...	<50	0	<10	2	470	20	<100	0	160
AUG 08...	<50	1	<10	2	200	10	<100	0	300

DATE	DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
OCT 04...	20	.0	.0	0	0	--	0	50	20
FEB 07...	1500	.0	.0	2	2	--	0	10	10
JUN 06...	90	.0	.0	1	1	--	0	0	0
AUG 08...	20	.0	.0	0	0	10	0	20	8

08123800 BEALS CREEK NEAR WESTBROOK, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO AUGUST 1977

DATE TIME	OCT 4.76 1630	NOV 2.76 0800	DEC 6.76 1430	JAN 4.77 0845	FEB 7.77 1430					
TOTAL CELLS/ML	6900	2100	390000	6800	2500					
DIVERSITY: DIVISION	1.5	0.9	0.1	1.1	1.0					
..CLASS	1.5	0.9	0.1	1.2	1.0					
...ORDER	1.5	1.6	0.1	1.4	1.1					
...FAMILY	1.5	1.8	0.1	1.4	1.1					
....GENUS	1.5	1.9	0.1	1.5	1.1					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE	--	-	--	-	--	-	--	-	--	-
...CHLOROCOCCALES										
....MICRACTINIACEAE										
....MICRACTINIUM	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE										
....ANKISTRODESMUS	--	-	* 0		--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	--	-	--	-
...OOCYSTIS	--	-	--	-	--	-	--	-	--	-
....TETRAEDRON	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE										
....ACTINASTRUM	--	-	--	-	--	-	--	-	--	-
....CRUCIGENIA	--	-	--	-	--	-	--	-	--	-
...SCENEDESMUS	* 0		--	-	--	-	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CARTERIA	--	-	--	-	--	-	--	-	--	-
....CHLAMYDOMONAS	360	5	23	1	2200	1	220	3	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCEACEAE										
....CYCLOTELLA	--	-	1000# 48		380000# 99		4800# 71		890# 36	
....MELOSIRA	--	-	69	3	--	-	--	-	--	-
...PENNIALES										
...CYMBELLACEAE										
....AMPHORA	--	-	--	-	--	-	* 0		--	-
...DIATOMACEAE										
....DIATOMA	--	-	--	-	--	-	* 0		--	-
...NAVICULACEAE										
....NAVICULA	* 0		92	4	--	-	* 0		47	2
...NITZSCHIA										
....NITZSCHIA	3600# 51		500# 24		--	-	270	4	--	-
...SURIPELLACEAE										
....SURTRELLA	--	-	* 0		--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCALES										
....CHROCOCCACEAE										
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-
...HORMOGONALES										
...NOSTOCACEAE										
....ANABAENOPSIS	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE										
....LYNGBYA	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIA	2700# 38		390# 18		--	-	430	6	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
...CRYPTOCHRYSIDACEAE										
...CHROOMONAS	--	-	--	-	--	-	54	1	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
...EUGLENACEAE										
....EUGLENA	360	5	23	1	* 0		860	13	1600# 63	
....PHACUS	--	-	* 0		--	-	110	2	--	-
....TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...PERIDINIALES										
...GLENODINIACEAE										
....GLENODINIUM	--	-	--	-	--	-	--	-	--	-
...PERIDINIACEAE										
....PERIDINIUM	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM: EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM. MAY NOT HAVE BEEN COUNTED: LESS THAN 1/2%

08123800 BEALS CREEK NEAR WESTBROOK, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO AUGUST 1977

DATE TIME	MAY 2,77 1640	JUN 6,77 1500	JUL 11,77 1520	AUG 8,77 1510	AUG 30,77 1700
TOTAL CELLS/ML	7900	63000	43000	100000	14000
DIVERSITY: DIVISION	0.8	1.4	1.6	0.7	1.2
..CLASS	0.8	1.4	1.6	0.7	1.2
...ORDER	0.8	2.1	0.0	0.7	1.6
...FAMILY	0.9	2.2	0.0	1.1	1.8
....GENUS	1.0	2.2	0.0	1.2	2.0

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE	--	-	--	-	9600#	22	--	-	--	-
...CHLOROCOCCALES										
....MICRACTINIACEAE										
.....MICRACTINIUM	--	-	2000	3	3300	8	--	-	--	-
...OOCYSTACEAE										
....ANKISTRODESMUS	--	-	--	-	--	-	2700	3	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	4500	4	--	-
....OOCYSTIS	--	-	--	-	--	-	900	1	--	-
....TETRAEDRON	--	-	--	-	--	-	*	0	--	-
...SCENEDESMACEAE										
....ACTINASTRUM	--	-	--	-	--	-	1800	2	--	-
....CPUCIGENIA	--	-	--	-	--	-	--	-	540	4
...SCENEDESMUS	--	-	2000	3	--	-	3100	3	--	-
...VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CARTERIA	310	4	--	-	--	-	--	-	--	-
....CHLAMYDOMONAS	--	-	9200	15	*	0	*	0	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCAEAE										
....CYCLOTELLA	430	5	7100	11	18000#	42	900	1	--	-
....MELOSIRA	370	5	--	-	--	-	--	-	--	-
...PENNAI ES										
...CYMBELLACEAE										
....AMPHORA	--	-	--	-	--	-	--	-	--	-
...DIATOMACEAE										
....DIATOMA	--	-	--	-	--	-	--	-	--	-
...NAVICULACEAE										
....NAVICULA	*	0	--	-	620	1	--	-	--	-
...NITZSCHIAEAE										
....NITZSCHIA	41	1	33000#	52	1900	4	--	-	--	-
...SURIPELLACEAE										
....SURIPELLA	*	0	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCOCCALES										
....CHROCOCCOCCAEAE										
.....ANACYSTIS	--	-	2500	4	--	-	--	-	1800	13
...HORMOGONALES										
....NOSTOCACEAE										
.....ANARAENOPSIS	--	-	--	-	--	-	4000	4	1400	10
...OSCILLATORIAEAE										
....LYNGBYA	--	-	5100	8	--	-	--	-	--	-
....OSCILLATORIA	6600#	84	--	-	9200#	21	81000#	81	2700#	19
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
....CRYPTOCHRYSIDACEAE										
.....CHROOMONAS	--	-	--	-	--	-	--	-	--	-
...EUGLENOPHYCEAE										
....EUGLENALES										
.....EUGLENACEAE										
....EUGLENA	*	0	2000	3	*	0	--	-	140	1
....PHACUS	--	-	--	-	--	-	--	-	270	2
....TRACHELOMONAS	--	-	--	-	--	-	*	0	7200#	51
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...PERIDINIALES										
....GLENODINIACEAE										
.....GLENODINIUM	--	-	--	-	*	0	--	-	--	-
...PERIDINIACEAE										
....PERIDINIUM	41	1	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

08123800 BEALS CREEK NEAR WESTBROOK, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA+MG) (MG/L)
OCT. 1976.....	740	4530	2850	5710	1080	2170	650	1300	980
NOV. 1976.....	148.4	8820	5930	2370	2310	925	1400	562	2030
DEC. 1976.....	151.3	11200	7680	3140	3000	1220	1830	747	****
JAN. 1977.....	189.1	10800	7370	3760	2880	1470	1750	896	****
FEB. 1977.....	168.3	11400	7810	3550	3060	1390	1870	848	****
MAR. 1977.....	217.9	10200	6930	4080	2700	1590	1650	969	****
APR. 1977.....	1142.5	5100	3240	9970	1240	3830	750	2300	1190
MAY 1977.....	313.7	7540	4960	4200	1960	1660	1180	1000	1740
JUNE 1977.....	1119.21	2380	1430	4310	540	1640	310	931	550
JULY 1977.....	666.7	2840	1710	3070	650	1170	370	669	640
AUG. 1977.....	195.9	4460	2810	1490	1080	572	640	339	960
SEPT 1977.....	58.43	5260	3380	533	1290	204	780	123	1220
TOTAL .....	5112.43	**	**	46200	**	17800	**	10700	**
WTD. AVG. ....	14	5180	3300	**	1300	**	780	**	1200

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3730	4600	11100	11000	10800	11200	13500	14100	1130	2590	2590	2460
2	7090	4500	11000	11000	11800	11200	13900	14400	1070	3280	2320	2740
3	6700	4350	11200	10700	13200	11500	11000	13900	3500	3750	2670	2840
4	5320	4260	11400	10600	11700	11800	9760	12900	3190	4040	3250	2980
5	3400	4430	11300	10900	11200	11700	8740	12900	3500	4670	3570	3110
6	1740	4500	11500	10700	11000	11700	8310	12600	3730	5530	3710	3230
7	2050	4870	11600	11100	11100	11500	8310	12700	3900	6420	4320	3300
8	2080	5650	11800	10900	10900	11600	8350	12200	4070	7560	5200	3370
9	2590	6470	11600	10700	10800	11100	9100	10500	4440	7000	5770	3640
10	2330	7850	11200	10600	11000	11300	10700	3830	4730	4590	6610	4330
11	3490	9190	11800	10300	11100	11100	10900	8680	5470	4870	7190	6140
12	4230	10400	11400	10500	11200	11300	10900	5500	6500	7160	8000	6540
13	3350	10300	10700	10300	10500	11200	10800	6310	7400	5080	8500	6920
14	3240	10400	10800	10100	11100	11100	9100	9550	8550	3670	10100	7200
15	4230	9280	10900	10300	11000	11000	5960	10900	9370	4300	8790	7480
16	6670	8300	11400	10300	10900	11100	4410	10900	9040	4910	8190	7770
17	8350	10400	11000	10100	10900	11000	5470	10400	8970	5530	8030	8150
18	9180	10200	11200	10600	11000	10900	6310	11500	9370	5430	7970	8500
19	9440	10100	11100	11000	11100	10700	3250	12400	9950	5400	7910	8710
20	10500	10700	11200	11400	12000	11000	1750	13600	10100	5460	7670	8860
21	9810	11000	11000	13500	11700	11100	3090	3290	9810	4110	6120	8900
22	9620	10800	11100	11400	11500	11000	3540	4360	9500	3860	5780	8940
23	10000	12900	10800	11200	14200	11200	5550	3450	8970	907	5330	8060
24	10200	12700	10600	11100	12500	11000	6200	4330	6440	1550	5050	7200
25	10200	11300	10900	10700	11900	10900	6800	4200	2560	2040	5530	5800
26	10000	10400	11000	10500	11300	10500	9530	4050	1300	2000	5730	5490
27	9670	11000	11100	10400	11200	9200	11700	4240	1570	2040	6000	6170
28	7370	11400	11200	10600	11100	8740	13300	4710	1880	2170	2290	8120
29	5610	11600	11100	10500	---	5470	14200	5380	2280	2240	1820	8830
30	1970	11400	11200	10500	---	12900	13300	6180	2410	2460	4000	9270
31	4190	---	11000	11100	---	12000	---	6770	---	2480	2250	---
MEAN	6080	8840	11200	10800	11400	10900	8590	8730	5490	4100	5560	6170



## COLORADO RIVER BASIN

08123800 BEALS CREEK NEAR WESTBROOK, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25.0	15.0	8.0	3.0	4.0	13.0	12.0	27.0	21.0	28.0	27.0	26.0
2	21.0	14.0	5.0	8.0	8.0	13.0	21.0	26.0	29.0	32.0	27.0	30.0
3	23.0	14.0	6.0	5.0	8.0	13.0	21.0	24.0	27.0	30.0	28.0	25.0
4	22.0	16.0	6.0	5.0	7.0	9.0	15.0	26.0	26.0	25.0	27.0	---
5	18.0	14.0	7.0	5.0	6.0	9.0	15.0	---	29.0	27.0	27.0	26.0
6	17.0	18.0	8.0	4.0	11.0	14.0	16.0	28.0	31.0	26.0	28.0	25.0
7	15.0	14.0	4.0	5.0	9.0	10.0	17.0	24.0	---	26.0	28.0	25.0
8	12.0	13.0	5.0	8.0	8.0	16.0	19.0	---	25.0	28.0	---	25.0
9	15.0	14.0	7.0	2.0	9.0	17.0	18.0	23.0	30.0	28.0	27.0	26.0
10	19.0	15.0	10.0	3.0	10.0	18.0	27.0	27.0	25.0	27.0	32.0	26.0
11	17.0	14.0	6.0	4.0	12.0	13.0	17.0	26.0	31.0	---	27.0	30.0
12	17.0	8.0	7.0	5.0	10.0	11.0	17.0	22.0	25.0	32.0	31.0	25.0
13	18.0	5.0	6.0	6.0	---	---	18.0	21.0	---	26.0	30.0	27.0
14	21.0	7.0	8.0	---	10.0	20.0	18.0	22.0	---	25.0	31.0	27.0
15	21.0	6.0	8.0	5.0	13.0	19.0	15.0	29.0	32.0	---	26.0	24.0
16	16.0	7.0	8.0	5.0	11.0	16.0	15.0	25.0	26.0	---	27.0	23.0
17	14.0	7.0	8.0	2.0	10.0	20.0	19.0	24.0	26.0	30.0	28.0	24.0
18	16.0	9.0	8.0	3.0	12.0	18.0	21.0	---	26.0	27.0	26.0	---
19	14.0	12.0	13.0	---	11.0	20.0	20.0	27.0	31.0	28.0	28.0	24.0
20	15.0	11.0	7.0	7.0	14.0	17.0	21.0	24.0	25.0	28.0	27.0	24.0
21	13.0	11.0	6.0	6.0	12.0	18.0	22.0	20.0	25.0	29.0	30.0	30.0
22	17.0	12.0	5.0	10.0	14.0	18.0	18.0	26.0	25.0	24.0	31.0	26.0
23	18.0	13.0	4.0	---	11.0	---	24.0	23.0	24.0	26.0	32.0	29.0
24	18.0	10.0	5.0	6.0	15.0	20.0	---	23.0	28.0	31.0	32.0	24.0
25	15.0	13.0	7.0	10.0	---	10.0	20.0	23.0	28.0	27.0	31.0	28.0
26	18.0	12.0	8.0	9.0	10.0	7.0	25.0	26.0	26.0	28.0	30.0	22.0
27	14.0	9.0	6.0	8.0	12.0	17.0	26.0	24.0	30.0	28.0	32.0	23.0
28	11.0	6.0	7.0	8.0	12.0	14.0	23.0	26.0	31.0	29.0	28.0	28.0
29	9.0	3.0	6.0	5.0	---	20.0	22.0	34.0	31.0	26.0	28.0	26.0
30	8.0	4.0	9.0	5.0	---	20.0	23.0	32.0	29.0	28.0	28.0	24.0
31	13.0	---	3.0	3.0	---	14.0	---	27.0	---	27.0	28.0	---
MEAN	16.5	11.0	7.0	5.5	10.5	15.5	19.5	25.5	27.5	27.5	28.5	26.0

## COLORADO RIVER BASIN

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## 08123850 COLORADO RIVER ABOVE SILVER, TX

LOCATION.--Lat 32°03'37", long 100°45'56", Coke County, Hydrologic Unit 12080008, on right bank 25 ft (7.6 m) downstream from a Pan American Oil Co. bridge, 4.7 mi (7.6 km) west of Silver, and at mile 756.6 (1,217.3 km).

DRAINAGE AREA.--15,407 mi<sup>2</sup> (39,904 km<sup>2</sup>), of which 11,600 mi<sup>2</sup> (30,000 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,907.66 ft (581.455 m) above mean sea level. Prior to Oct. 4, 1972, water-stage recorder at site 0.5 mi (0.8 km) downstream at same datum.

REMARKS.--Water-discharge records good. Low flow is affected by upstream diversions, see stations 08121000 and 08123650. Some regulation by Lake J. B. Thomas, Lake Colorado City, and Champion Creek Reservoir (see stations 08118000, 08123000, and 08123600).

AVERAGE DISCHARGE.--10 years, 65.0 ft<sup>3</sup>/s (1.841 m<sup>3</sup>/s), 47,090 acre-ft/yr (58.1 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,900 ft<sup>3</sup>/s (365 m<sup>3</sup>/s) May 29, 1971, gage height, 17.68 ft (5.389 m), at former site; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,760 ft<sup>3</sup>/s (78.2 m<sup>3</sup>/s) Aug. 30, gage height, 9.10 ft (2.774 m); minimum, 0.33 ft<sup>3</sup>/s (0.009 m<sup>3</sup>/s) Aug. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	123	6.1	8.2	14	11	20	30	8.5	37	6.5	161
2	14	72	6.1	8.5	14	10	11	22	198	27	3.8	98
3	11	48	5.9	9.3	12	8.7	8.5	23	103	21	2.8	57
4	18	36	6.2	7.9	12	8.2	5.4	19	42	13	3.0	34
5	63	31	7.3	7.1	12	8.4	5.0	26	20	7.1	2.3	25
6	614	26	6.3	7.5	12	7.2	5.8	48	10	3.8	1.8	18
7	1150	16	6.3	9.2	11	7.4	5.5	24	7.1	3.0	1.5	18
8	205	12	6.9	8.5	12	8.4	5.1	19	6.5	3.0	1.1	17
9	196	10	9.9	10	12	8.4	5.9	43	4.8	5.9	.98	15
10	169	9.3	15	11	12	9.6	6.2	51	3.8	6.5	.91	15
11	92	8.4	14	11	12	5.8	5.5	163	2.6	18	.74	23
12	61	7.9	15	12	11	6.6	5.2	131	2.6	14	.64	35
13	46	11	15	12	11	8.7	4.4	76	2.3	7.1	.54	18
14	36	13	15	19	15	7.8	14	49	2.3	4.7	.46	13
15	24	13	16	23	25	7.1	137	46	1.3	2.6	.39	10
16	17	13	16	25	24	7.9	258	28	.64	2.0	.99	8.0
17	15	14	16	24	21	8.6	393	22	.64	1.5	2.0	6.8
18	14	23	18	22	20	7.2	289	21	.54	1.2	2.0	5.1
19	12	24	17	22	18	6.4	233	19	.74	1.1	1.7	4.6
20	11	23	11	22	18	7.6	336	16	1.3	.86	50	4.5
21	11	21	9.7	22	21	5.9	297	19	2.0	.74	23	3.6
22	11	21	8.6	23	21	6.8	280	140	2.1	47	13	3.3
23	11	19	8.8	23	18	7.0	283	120	4.8	128	16	3.4
24	9.9	19	8.9	23	12	6.8	146	51	135	165	8.6	2.6
25	9.4	19	7.5	25	8.6	7.9	87	29	333	118	3.2	2.2
26	11	13	8.2	28	8.6	10	57	22	357	47	2.2	2.0
27	13	8.0	7.9	18	9.3	16	52	18	354	28	1.8	2.0
28	25	7.4	7.2	13	9.3	42	50	14	179	31	20	2.1
29	131	6.7	11	13	---	36	42	15	79	22	798	1.6
30	352	6.5	9.4	14	---	40	37	25	50	14	2450	1.5
31	230	---	8.2	14	---	29	---	10	---	12	818	---
TOTAL	3603.3	674.2	324.4	495.2	405.8	368.4	3084.5	1339	1914.56	793.10	4237.95	610.3
MEAN	116	22.5	10.5	16.0	14.5	11.9	103	43.2	63.8	25.6	137	20.3
MAX	1150	123	18	28	25	42	393	163	357	165	2450	161
MIN	9.4	6.5	5.9	7.1	8.6	5.8	4.4	10	.54	.74	.39	1.5
AC-FT	7150	1340	643	982	805	731	6120	2660	3800	1570	8410	1210
CAL YR 1976	TOTAL	17221.21	MEAN	47.1	MAX	1610	MIN	.13	AC-FT	34160		
WTR YR 1977	TOTAL	17850.71	MEAN	48.9	MAX	2450	MIN	.39	AC-FT	35410		

## COLORADO RIVER BASIN

08123850 COLORADO RIVER ABOVE SILVER, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: December 1967 to current year. Pesticide analyses: October 1970 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1967 to current year.

WATER TEMPERATURES: December 1967 to current year.

INSTRUMENTATION.--Specific conductance is recorded continuously at this station.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 13,600 micromhos Mar. 18, May 19, 1969; minimum daily, 235 micromhos Aug. 10, 1974.

WATER TEMPERATURES: Maximum daily, 29.0°C on several days during summer months of 1968 and 1973; minimum daily, 0.0°C on many days during winter months.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 13,300 micromhos Apr. 6; minimum daily, 595 micromhos Oct. 7.

WATER TEMPERATURES: Maximum daily, 28.0°C Aug. 23; minimum daily, 0.0°C Jan. 1.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT										
08...	1030	189	893	7.8	17.0	190	96	54	14	110
DEC										
27...	1210	10	8780	7.2	12.5	1900	1700	370	240	1400
FEB										
28...	1335	9.4	9040	7.6	10.5	1900	1800	350	260	1500
MAR										
24...	1500	7.5	10300	7.2	19.0	2400	2300	430	310	1600
MAY										
27...	1620	28	3560	7.6	28.0	680	530	160	68	520
JUN										
20...	1140	1.3	5800	7.2	27.0	1300	1200	290	130	800
JUL										
15...	1030	3.0	4180	7.3	26.5	1100	1000	260	120	570
AUG										
25...	1230	3.3	2580	7.2	33.0	640	570	150	64	320
SEP										
12...	1210	80	4480	7.4	25.0	870	750	210	85	710

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT									
08...	3.5	6.0	118	0	100	150	.3	6.3	499
DEC									
27...	14	20	207	0	1500	2300	--	2.5	5930
FEB									
28...	15	22	161	0	1700	2400	--	.6	6310
MAR									
24...	14	25	110	0	2000	2500	--	2.8	6920
MAY									
27...	8.7	9.8	180	0	520	760	.6	4.7	2130
JUN									
20...	9.8	32	110	0	1100	1300	--	2.7	3710
JUL									
15...	7.3	16	160	0	740	1000	.7	8.2	2790
AUG									
25...	5.5	11	80	0	460	530	.5	6.1	1580
SEP									
12...	10	11	150	0	740	1100	.6	7.3	2940

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	TOTAL PCB (UG/L)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)
OCT									
04...	1445	25	23.5	.0	.00	.00	.0	.00	.00
FEB									
08...	0800	12	--	.0	.00	.00	.0	.00	.00
JUN									
06...	1700	18	31.5	.0	.00	.00	.0	.00	.00
AUG									
08...	1800	1.5	31.5	.0	.00	.00	.0	.00	.00

COLORADO RIVER BASIN

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08123850 COLORADO RIVER ABOVE SILVER, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)
OCT 04...	.00	.02	.00	.00	.00	.00	.00	.00	.00
FEB 08...	.00	.06	.00	.00	.00	.00	.00	.01	.00
JUN 06...	.00	.02	.00	.00	.00	.00	.00	.00	.00
AUG 08...	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 04...	.00	.00	.00	0	.00	.00	.01	.00
FEB 08...	.00	.00	.00	0	.00	.00	.00	.00
JUN 06...	.00	.00	.00	0	.00	.03	.02	.00
AUG 08...	.00	.00	.00	0	.00	.02	.03	.00

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	TEMPER- ATURE (DEG C)	SUS- PENDE SEDI- MENT (MG/L)	SUS- PENDE SEDI- MENT (T/DAY)	SUS. SED. FALL DIAM. % FINER THAN .002 MM	SUS. SED. FALL DIAM. % FINER THAN .004 MM
MAR 24...	1330	7.5	21.0	29	.59	--	--
MAR 28...	--	57	13.5	121	19	--	--
AUG 29...	1315	764	27.0	4590	9470	--	--
AUG 30...	0500	2640	25.0	3470	24700	--	--
AUG 31...	1700	364	29.0	84	83	63	72

DATE	SUS. SED. FALL DIAM. % FINER THAN .008 MM	SUS. SED. FALL DIAM. % FINER THAN .016 MM	SUS. SED. FALL DIAM. % FINER THAN .031 MM	SUS. SED. FALL DIAM. % FINER THAN .062 MM	SUS. SED. FALL DIAM. % FINER THAN .125 MM	SUS. SED. FALL DIAM. % FINER THAN .250 MM	SUS. SED. FALL DIAM. % FINER THAN .500 MM
MAR 24...	--	--	--	--	--	--	--
MAR 28...	--	--	--	--	--	--	--
AUG 29...	--	--	--	--	--	--	--
AUG 30...	--	--	--	--	--	--	--
AUG 31...	79	89	94	96	97	98	100

## COLORADO RIVER BASIN

08123850 COLORADO RIVER ABOVE SILVER, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	3603.3	2050	1200	11700	440	4280	260	2520	460
NOV. 1976.....	674.2	4950	3110	5670	1200	2180	750	1360	1110
DEC. 1976.....	324.4	8390	5660	4960	2090	1830	1570	1380	1880
JAN. 1977.....	495.2	8320	5610	7510	2080	2770	1560	2080	1860
FEB. 1977.....	405.8	8920	6070	6650	2240	2450	1690	1860	2000
MAR. 1977.....	368.4	9290	6360	6320	2330	2320	1780	1770	2080
APR. 1977.....	3084.5	3510	2140	17800	820	6810	490	4110	790
MAY 1977.....	1339	4430	2750	9950	1050	3800	670	2420	990
JUNE 1977.....	1914.56	2310	1340	6940	490	2530	300	1530	520
JULY 1977.....	793.1	2490	1450	3110	540	1160	310	660	560
AUG. 1977.....	4237.95	883	510	5790	140	1640	130	1490	200
SEPT 1977.....	610.3	3440	2060	3390	790	1300	440	720	770
TOTAL .....	17850.68	**	**	89800	**	33100	**	21900	**
WTD.AVG. ....	48.91	3000	1900	**	690	**	450	**	670

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3700	3660	7690	9230	9070	9320	6870	3540	4130	2240	2970	2220
2	4540	4000	7810	9070	9230	9280	6330	3880	2760	2320	3070	2730
3	5520	3540	8120	8920	9070	9360	5800	4180	1860	2540	3270	3190
4	5340	3650	8390	8670	9150	9450	6520	4400	3040	2660	3360	3520
5	2200	3770	8540	8720	9070	9570	9530	5290	3980	2800	3550	3880
6	2490	3830	8680	8780	9020	9630	13300	8810	5560	2940	3740	4150
7	595	4010	9230	8270	8990	9720	11800	3860	5840	3090	3930	4350
8	877	4190	9020	8780	8870	9810	10200	5500	6110	3260	4130	4550
9	1750	4320	8750	8700	8760	9950	9220	6040	5460	3330	4340	4620
10	2120	4560	8900	8610	8880	10100	8490	9010	4820	3420	4550	4770
11	2470	4720	9100	8560	8760	10600	7920	3070	4470	3550	4720	4700
12	2450	4850	7500	8500	8880	11100	7430	2530	4340	3650	4850	4580
13	2750	4650	7290	8330	9070	10800	7240	2830	4300	3760	4910	4640
14	3080	4550	7030	8210	8990	10600	6970	2080	4470	3890	5000	4790
15	3260	4790	6800	8330	10000	10300	8370	2650	4880	4200	5250	4850
16	3450	4940	7910	7850	8960	10200	5340	2940	5290	4470	5490	4530
17	3590	5080	9710	7600	7920	10000	4010	3700	5410	4700	5100	4200
18	3800	5210	8430	7260	7300	10300	3130	4400	5520	4920	5080	4150
19	3920	5970	8550	7070	6820	10400	4070	4490	5660	5450	5000	4270
20	4000	7090	8680	10500	7050	10200	3340	4470	5790	5610	3920	4440
21	4080	7500	8460	8990	11000	10300	2710	4320	5900	5840	2790	4580
22	4300	7950	8430	8460	9900	10100	1590	5490	5970	2830	2350	4530
23	4540	7920	8400	8300	9540	10300	2000	5200	5600	2390	2200	4610
24	4480	7780	8380	8140	9200	10200	1390	7010	4160	1600	2380	4790
25	4410	7500	8430	8080	9120	9950	1830	5970	2240	2080	2740	4890
26	4650	7390	8600	7920	9040	9000	2610	4060	2150	3500	3240	4930
27	4850	7270	8790	7960	9000	8900	2780	3580	1430	3720	3590	4960
28	4320	7300	8910	8140	9070	8300	3120	3420	1520	3370	3480	5370
29	4750	7340	8980	8400	---	8580	3400	3560	1920	2430	1060	5500
30	3080	7390	9230	8410	---	8110	3480	3730	2580	2530	595	5610
31	3200	---	9100	8430	---	8580	---	4100	---	2800	1060	---
MEAN	3500	5560	8450	8430	8920	9770	5690	4460	4240	3420	3600	4430



## COLORADO RIVER BASIN

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08123850 COLORADO RIVER ABOVE SILVER, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.0	13.0	5.0	0.0	4.0	7.0	18.0	21.0	23.0	26.0	24.0	25.0
2	21.0	17.0	5.0	---	6.0	9.0	23.0	23.0	26.0	25.0	25.0	25.0
3	---	17.0	6.0	3.0	6.0	10.0	16.0	22.0	26.0	24.0	25.0	26.0
4	20.0	13.0	5.0	5.0	6.0	10.0	10.0	23.0	25.0	25.0	26.0	26.0
5	19.0	12.0	---	4.0	10.0	9.0	12.0	22.0	25.0	25.0	24.0	26.0
6	17.0	13.0	6.0	3.0	---	7.0	13.0	22.0	25.0	26.0	25.0	25.0
7	15.0	---	4.0	4.0	7.0	8.0	14.0	22.0	24.0	25.0	25.0	25.0
8	12.0	12.0	5.0	7.0	7.0	10.0	20.0	23.0	22.0	27.0	25.0	25.0
9	13.0	13.0	6.0	---	7.0	10.0	18.0	22.0	23.0	27.0	24.0	25.0
10	---	14.0	8.0	---	8.0	12.0	18.0	21.0	24.0	26.0	25.0	25.0
11	16.0	---	5.0	---	5.0	12.0	16.0	20.0	25.0	26.0	25.0	25.0
12	16.0	9.0	---	3.0	10.0	12.0	16.0	19.0	23.0	25.0	26.0	23.0
13	17.0	4.0	6.0	4.0	8.0	10.0	17.0	20.0	24.0	24.0	25.0	24.0
14	17.0	---	7.0	4.0	7.0	12.0	17.0	21.0	26.0	24.0	25.0	24.0
15	20.0	5.0	7.0	4.0	9.0	11.0	16.0	21.0	25.0	27.0	26.0	22.0
16	16.0	5.0	5.0	---	8.0	10.0	15.0	22.0	26.0	27.0	26.0	23.0
17	---	5.0	5.0	3.0	10.0	12.0	15.0	22.0	24.0	25.0	25.0	23.0
18	14.0	7.0	7.0	2.0	5.0	15.0	16.0	21.0	25.0	25.0	25.0	24.0
19	14.0	11.0	---	6.0	10.0	16.0	18.0	22.0	24.0	24.0	26.0	23.0
20	11.0	11.0	5.0	4.0	10.0	15.0	18.0	22.0	23.0	25.0	25.0	22.0
21	12.0	---	3.0	4.0	10.0	10.0	16.0	20.0	23.0	25.0	25.0	22.0
22	12.0	10.0	4.0	7.0	12.0	9.0	20.0	21.0	23.0	24.0	26.0	24.0
23	17.0	11.0	3.0	---	11.0	9.0	20.0	22.0	24.0	26.0	28.0	24.0
24	---	11.0	5.0	5.0	9.0	12.0	18.0	23.0	26.0	26.0	26.0	24.0
25	14.0	12.0	5.0	4.0	5.0	15.0	18.0	21.0	26.0	26.0	25.0	24.0
26	12.0	11.0	---	7.0	10.0	17.0	19.0	22.0	25.0	27.0	25.0	22.0
27	12.0	6.0	9.0	7.0	7.0	---	19.0	20.0	26.0	26.0	26.0	25.0
28	10.0	---	8.0	6.0	5.0	11.0	19.0	25.0	26.0	25.0	24.0	24.0
29	11.0	1.0	5.0	4.0	---	13.0	21.0	25.0	25.0	25.0	25.0	24.0
30	10.0	2.0	7.0	---	---	14.0	20.0	22.0	25.0	26.0	24.0	24.0
31	---	---	1.0	3.0	---	13.0	---	25.0	---	25.0	25.0	---
MEAN	15.0	10.0	5.5	4.5	8.0	11.5	17.0	22.0	24.5	25.5	25.0	24.0

## 08123950 E. V. SPENCE RESERVOIR NEAR ROBERT LEE, TX

LOCATION.--Lat 31°52'46", long 100°31'01", Coke County, Hydrologic Unit 12080008, in outlet works of Robert Lee Dam on the Colorado River, 2.2 mi (3.5 km) west of Robert Lee, and at mile 715 (1,150 km).

DRAINAGE AREA.--15,740 mi<sup>2</sup> (40,770 km<sup>2</sup>), approximately, of which 11,600 mi<sup>2</sup> (30,040 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Prior to June 24, 1969, nonrecording gage at same site and datum.

REMARKS.--The reservoir is formed by a rolled earthfill dam 21,500 ft (6,550 m) long. Closure was made Dec. 30, 1968, and dam was completed in June 1969. The dam is the property of the Colorado River Municipal Water District, which has a permit to divert 50,000 acre-ft (61.6 hm<sup>3</sup>) annually for municipal, mining, and industrial uses. Inflow to reservoir is partially regulated by Lake J. B. Thomas, Lake Colorado City, and Champion Creek Reservoir (stations 08118000, 08123000, and 08123600). There are two spillways. The service spillway is a morning-glory type that is partially controlled by 12 lift gates, 14.48 by 22.0 ft (4.41 by 6.7 m), and discharges through a 28.0-foot-diameter (8.5 m) concrete conduit. The emergency spillway is a 3,200-foot-wide (975 m) cut through natural ground near the right end of dam. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	1,928.0	-
Crest of spillway.....	1,908.0	653,400
Top of gates.....	1,900.0	519,300
Top of conservation pool.....	1,898.0	488,800
Crest of spillway.....	1,878.0	262,900
Lowest gated outlet (invert).....	1,815.85	4,000

COOPERATION.--The Colorado River Municipal Water District furnished the capacity table (dated March 1972). Records of diversions furnished by the city of San Angelo and by the Colorado River Municipal Water District.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 181,900 acre-ft (224 hm<sup>3</sup>) Sept. 17, 1975, elevation, 1,867.93 ft (569.345 m); minimum since first appreciable storage in June 1969 not recorded, about 330 acre-ft (0.407 hm<sup>3</sup>) May 29, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 169,900 acre-ft (209 hm<sup>3</sup>) Nov. 2, elevation, 1,866.21 ft (568.821 m); minimum, 153,100 acre-ft (189 hm<sup>3</sup>) Aug. 27, elevation, 1,863.73 ft (568.065 m).

Capacity table (elevation, in feet, and total contents, in acre-feet)

1,863.0	148,400
1,865.0	161,400
1,867.0	175,400

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	165200	169800	167600	165400	164100	162700	161100	165800	163800	164300	159300	159100
2	165100	169800	167600	165300	164100	162500	161000	165800	163900	163900	158800	159100
3	164900	169800	167500	165300	164100	162500	160800	165700	163800	163600	158300	158900
4	164900	169700	167400	165300	164000	162400	160800	165600	163600	163400	158100	158900
5	164800	169600	167400	165300	163900	162200	160600	165500	163500	163400	157800	158800
6	164800	169500	167300	165300	163900	162100	160500	165500	163300	163200	157400	158800
7	167700	169500	167200	165000	163900	162100	160400	165400	163100	162900	156900	158700
8	168100	169500	167100	165000	163900	161900	160200	165400	162800	162500	156800	158500
9	168500	169400	167100	164900	163900	161900	160100	165500	162500	162200	156500	158300
10	168800	169300	167100	164800	163900	161800	160000	165400	162000	161900	156400	158200
11	168800	169100	167000	164800	163900	161800	159800	165300	162000	161600	156200	158000
12	168600	169000	167000	164800	163900	161600	159700	165600	161800	161300	155800	158300
13	168500	169000	166900	164800	163900	161500	159600	165400	161800	161100	155600	158000
14	168500	168900	166900	164800	163900	161300	160200	165400	161500	161000	155600	157800
15	168400	168900	166800	164800	163900	161200	160300	165300	161400	160800	155400	157500
16	168100	168800	166800	164700	163800	161100	161700	165100	161000	160500	155200	157200
17	167900	168800	166700	164600	163800	160900	162700	165000	160600	160200	154900	157000
18	167800	168600	166700	164600	163700	160800	163500	164900	160400	160100	154400	156800
19	167600	168800	166700	164400	163600	160700	163900	164800	160000	160100	154200	156500
20	167400	168700	166600	164400	163600	160600	164500	164700	159600	160000	154200	156400
21	167300	168500	166500	164500	163400	160400	164800	164600	159200	160000	154300	156200
22	167100	168400	166300	164500	163300	160200	165100	164500	159600	160000	154300	156000
23	167100	168400	166200	164600	163200	160100	165600	164400	159700	160000	154200	155900
24	167000	168400	166200	164600	163200	160000	165700	164300	159800	160100	153900	155900
25	166800	168300	166200	164600	163000	160000	165700	164100	162500	160100	153600	155800
26	166600	168200	166200	164600	162900	161700	165800	164100	163900	160000	153300	155700
27	167400	168100	166000	164500	162800	161600	165900	164000	164300	159900	153100	155600
28	168100	168000	166000	164300	162700	161600	165800	163900	164600	159800	153200	155400
29	168700	167800	165900	164200	---	161600	165800	163800	164500	159700	153200	155000
30	169100	167700	165700	164200	---	161500	165800	163700	164400	159600	156700	154800
31	169500	---	165600	164100	---	161300	---	163600	---	159500	159100	---
(†)	1866.16	1865.90	1865.60	1865.39	1865.19	1864.99	1865.63	1865.31	1865.43	1864.70	1864.65	1863.98
(*)	+4300	-1800	-2100	-1500	-1400	-1400	+4500	-2200	+800	-4900	-400	-4300
(††)	1610	1490	1310	1650	1590	2010	1990	2450	2220	2500	2230	2280
MAX	169500	169800	167600	165400	164100	162700	165900	165800	164600	164300	159300	159100
MIN	164800	167700	165600	164100	162700	160000	159600	163600	159200	159500	153100	154800
CAL YR 1976	MAX	172500	MIN	157800	+	-7000	††	22850				
WTR YR 1977	MAX	169800	MIN	153100	+	-10400	††	23330				

† Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

†† Diversions, in acre-feet, for municipal, industrial, and mining uses.

COLORADO RIVER BASIN

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08123950 E. V. SPENCE RESERVOIR NEAR ROBERT LEE, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)
NOV 15...	0830	2650	8.0	10.0	530	410	110	61	340
FEB 07...	0730	2730	7.9	6.0	540	420	120	59	360
MAR 21...	0750	2780	7.9	12.0	550	420	120	60	370
SEP 06...	0815	3050	7.5	24.5	590	480	120	71	470
DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF TUENTS) (MG/L)
NOV 15...	6.5	15	144	0	360	570	.4	4.2	1530
FEB 07...	6.7	27	152	0	360	600	.3	3.7	1610
MAR 21...	6.9	14	154	0	390	600	.3	3.8	1630
SEP 06...	8.4	13	140	0	450	690	.5	4.6	1890



## 08125500 OAK CREEK RESERVOIR NEAR BLACKWELL, TX

LOCATION.--Lat 32°03'25", long 100°17'37", Coke County, Hydrologic Unit 12080008, on left bank at municipal pump station, 1.9 mi (3.1 km) upstream from dam on Oak Creek, 2.5 mi (4.0 km) southeast of Blackwell, 14 mi (23 km) north of Bronte, and 20 mi (32 km) upstream from mouth.

DRAINAGE AREA.--244 mi<sup>2</sup> (632 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1953 to current year. Prior to October 1969, monthend contents only.

GAGE.--Nonrecording gage. Datum of gage is at mean sea level.

REMARKS.--The reservoir is formed by a rolled earthfill dam 3,800 ft (1,160 m) long. The dam was completed in May 1952, and deliberate impoundment began May 12, 1953. The emergency spillway is an uncontrolled 800-foot-wide (240 m) cut through natural ground, 1,200 ft (366 m) from right end of dam. The service spillway is an uncontrolled cut channel through natural ground 300 ft (91 m) wide, located 2,000 ft (610 m) from right end of dam. The reservoir and dam are the property of the city of Sweetwater. The dam was built to impound water for municipal and industrial uses by the cities of Sweetwater, Blackwell, and Bronte. Since April 1962, West Texas Utilities Co. has operated a steam generating powerplant located on Oak Creek Reservoir. There is a gated outlet at the service spillway that can release water downstream to Oak Creek through a 24-inch (610-millimeter) concrete pipe. Capacity curve is based on a 1950 survey. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	2,014.0	-
Crest of spillway.....	2,005.0	52,490
Crest of spillway (top of conservation pool).....	2,000.0	39,360
Lowest gated outlet (invert).....	1,951.0	100

COOPERATION.--Capacity curve, record of lake elevations, and diversions furnished by city of Sweetwater.

EXTREMES (at 0800) FOR PERIOD OF RECORD.--Maximum contents observed, 49,100 acre-ft (60.5 hm<sup>3</sup>) Oct. 13, 1957, elevation, 2,003.80 ft (610.758 m); minimum observed, 7,060 acre-ft (8.70 hm<sup>3</sup>) Aug. 1, 1953, elevation, 1,976.2 ft (602.35 m).

EXTREMES (at 0800) FOR CURRENT YEAR.--Maximum contents, 26,310 acre-ft (32.4 hm<sup>3</sup>) May 10-12, June 22, 23, 25, 26, elevation, 1,993.6 ft (607.65 m); minimum, 22,020 acre-ft (27.2 hm<sup>3</sup>) Sept. 27-30, elevation, 1,991.0 ft (606.86 m).

Capacity table (elevation, in feet, and total contents, in acre-feet)

1,991.0	22,020
1,992.5	24,430
1,994.0	27,010

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 0800

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25610	25440	25440	25260	25090	24600	24600	26140	25960	25960	24260	23130
2	25610	25440	25440	25260	25090	24600	24600	26140	26310	25960	24260	23130
3	25440	25440	25440	25260	24930	24600	24600	26140	26310	25960	24100	23130
4	25440	25440	25440	25260	24930	24600	24600	26140	26310	25790	24100	23130
5	25610	25440	25440	25260	24930	24600	24600	26140	26140	25610	24100	22970
6	25440	25440	25440	25090	24930	24600	24600	26140	26140	25610	24100	22970
7	25440	25440	25440	25090	24930	24430	24600	26140	25960	25610	23930	22970
8	25440	25440	25440	25090	24930	24430	24430	26140	25960	25610	23930	22970
9	25440	25440	25440	25090	24930	24430	24430	26140	25960	25440	23770	22970
10	25440	25440	25440	25090	24930	24430	24430	26310	25960	25440	23770	22810
11	25440	25440	25440	25090	24930	24430	24430	26310	25960	25440	23770	22810
12	25260	25440	25440	25090	24930	24430	24430	26310	25960	25260	23600	22810
13	25260	25440	25440	25090	24930	24260	24430	26140	25790	25260	23600	22650
14	25260	25440	25440	25090	24930	24260	24430	26140	25610	25090	23600	22650
15	25260	25440	25440	25090	24930	24260	24930	26140	25610	24930	23440	22650
16	25260	25440	25440	25090	24930	24260	24930	26140	25610	24760	23440	22650
17	25260	25440	25440	25090	24930	24260	25260	26140	25610	24600	23280	22650
18	25260	25440	25440	25090	24930	24260	25440	26140	25440	24600	23280	22650
19	25090	25440	25440	25090	24930	24260	25440	26140	25440	24600	23280	22490
20	25090	25440	25440	25090	24930	24260	25610	26140	25440	24430	23280	22490
21	24930	25440	25440	25090	24930	24100	25790	26140	25440	24260	23130	22490
22	24930	25440	25440	25090	24930	24100	25790	25960	26310	24760	23130	22340
23	24930	25440	25440	25090	24930	24100	25790	25960	26310	24760	23280	22340
24	24930	25440	25440	25090	24760	24100	25960	25960	26140	24600	23280	22340
25	24930	25440	25440	25090	24760	23930	25960	25960	26310	24600	23130	22340
26	24760	25440	25260	25090	24760	23930	25960	25960	26310	24600	23130	22180
27	24760	25440	25260	25090	24600	24600	25960	25960	26140	24430	23280	22020
28	24930	25440	25260	25090	24600	24600	25960	25960	26140	24430	23280	22020
29	25090	25440	25260	25090	---	24600	25960	25960	26140	24430	23280	22020
30	25260	25440	25260	25090	---	24600	25960	25960	25960	24260	23280	22020
31	25260	---	25260	25090	---	24600	---	25960	---	24260	23280	---
(†)	1993.0	1993.1	1993.0	1992.9	1992.6	1992.6	1993.4	1993.4	1993.4	1992.4	1991.8	1991.0
(+)	-350	+180	-180	-170	-490	0	+1360	0	0	-1700	-980	-1260
(††)	571	230	213	327	342	337	343	437	384	395	438	423
MAX	25610	25440	25440	25260	25090	24600	25960	26310	26310	25960	24260	23130
MIN	24760	25440	25260	25090	24600	23930	24430	25960	25440	24260	23130	22020
CAL YR 1976	MAX	33620	MIN	24760	*	-8570	††	5490				
WTR YR 1977	MAX	26310	MIN	22020	*	-3590	††	4440				

† Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

†† Diversions, in acre-feet, for municipal and industrial uses.



## COLORADO RIVER BASIN

08125500 OAK CREEK RESERVOIR NEAR BLACKWELL, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHQS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)
MAY 02...	1030	1200	7.7	28.0	420	270	92	45	78
DATE	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
MAY 02...	1.7	7.1	180	0	260	120	.4	6.0	697

## COLORADO RIVER BASIN

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08126500 COLORADO RIVER AT BALLINGER, TX

LOCATION.--Lat 31°43'58", long 99°57'13", Runnels County, Hydrologic Unit 12090101, on left bank at downstream side of bridge on U.S. Highway 67 in Ballinger, 1.3 mi (2.1 km) upstream from Elm Creek, and at mile 660.2 (1,062.3 km).

DRAINAGE AREA.--16,840 mi<sup>2</sup> (43,620 km<sup>2</sup>), approximately, of which 11,600 mi<sup>2</sup> (30,040 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1907 to current year. Monthly discharge only for some periods published in WSP 1312. Gage-height records collected in this vicinity from 1903-29 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1118: Drainage area. WSP 1512: 1916-17, 1919-20, 1921(M), 1922-25, 1928(M), 1930(M). WSP 1712: 1935, 1954-55(M).

GAGE.--Water-stage recorder. Datum of gage is 1,593.74 ft (485.772 m) above mean sea level. Prior to Nov. 29, 1930, nonrecording gages at several sites near present site at various datums. Nov. 29, 1930, to May 1, 1975, water-stage recorder at site 0.8 mi (1.3 km) downstream at same datum.

REMARKS.--Water-discharge records good. Diversions above station for irrigation, municipal supplies, and oilfield operation. Flow is affected by E. V. Spence and Oak Creek Reservoirs (see stations 08123950 and 08125500) and at times by discharge from the flood-detention pools of 25 floodwater-retarding structures with a combined detention capacity of 26,640 acre-ft (32.8 hm<sup>3</sup>). These structures control runoff from 133 mi<sup>2</sup> (344 km<sup>2</sup>) in the Kickapoo and Valley Creeks drainage basins.

AVERAGE DISCHARGE.--61 years (water years 1908-68) prior to completion of Robert Lee Dam, 336 ft<sup>3</sup>/s (9.516 m<sup>3</sup>/s), 243,400 acre-ft/yr (300 hm<sup>3</sup>/yr); 9 years (water years 1969-77) partially regulated, 48.3 ft<sup>3</sup>/s (1.368 m<sup>3</sup>/s), 34,990 acre-ft/yr (43.1 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 75,400 ft<sup>3</sup>/s (2,140 m<sup>3</sup>/s) Sept. 18, 1936, gage height, 28.6 ft (8.72 m); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1882, about 36 ft (11.0 m) sometime in 1884, at former site and datum, from information by local residents. Flood of Aug. 6, 1906, reached a stage of about 32.0 ft (9.75 m), at former site and datum, from floodmarks (backwater from Elm Creek).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,020 ft<sup>3</sup>/s (57.2 m<sup>3</sup>/s) Oct. 29, gage height, 4.52 ft (1.378 m); no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	143	23	21	25	16	32	49	207	16	.82	2.9
2	10	87	24	21	23	15	28	45	286	13	.82	1.9
3	8.5	63	23	22	23	15	26	42	64	9.1	.82	2.1
4	8.1	49	23	23	24	16	22	37	36	7.2	.30	2.1
5	13	39	24	24	24	18	21	35	26	6.1	.08	1.2
6	19	33	25	24	23	17	20	37	20	5.6	.00	1.2
7	19	31	26	23	24	14	20	34	15	5.6	.00	2.6
8	30	29	24	22	27	14	18	33	12	5.2	.00	2.9
9	21	27	24	23	26	13	17	38	11	4.5	.00	2.9
10	21	26	23	20	24	14	17	44	9.0	4.1	.00	2.1
11	17	26	25	21	25	15	17	38	9.9	3.1	.00	2.4
12	14	27	24	24	25	15	15	41	7.4	2.3	.00	2.9
13	13	26	24	28	24	15	15	39	6.2	6.2	.00	2.6
14	12	28	24	30	24	14	22	35	4.3	5.9	.00	2.4
15	13	28	25	29	23	14	410	32	3.5	4.5	.00	2.1
16	35	28	25	31	20	14	354	31	1.8	3.6	.00	1.2
17	23	28	25	25	19	13	1080	28	2.4	3.1	.00	.82
18	20	28	25	26	20	11	354	26	1.8	2.6	.00	1.2
19	16	28	25	23	20	12	147	24	2.9	2.8	.00	1.4
20	15	28	27	23	19	11	140	24	3.4	2.5	.00	.30
21	12	28	24	24	18	9.8	479	23	3.0	2.0	.00	.00
22	11	27	23	26	17	9.6	226	22	3.3	3.6	.00	.00
23	11	25	23	28	14	9.0	108	22	3.6	20	.00	.00
24	11	25	23	29	15	8.6	77	20	17	26	.00	.00
25	11	25	23	29	15	8.6	58	18	55	10	.00	.00
26	12	25	24	27	16	13	49	14	128	5.4	8.8	.00
27	22	27	23	26	15	172	44	13	173	4.6	7.4	.00
28	47	24	23	25	14	168	37	12	66	3.2	3.7	.00
29	1150	23	23	24	---	85	37	14	31	2.4	2.9	.00
30	1120	22	22	24	---	60	55	74	21	.82	3.4	.00
31	308	---	26	25	---	45	---	68	---	.82	3.7	---
TOTAL	3056.6	1053	745	770	586	874.6	3945	1012	1230.5	191.84	32.74	39.22
MEAN	98.6	35.1	24.0	24.8	20.9	28.2	132	32.6	41.0	6.19	1.06	1.31
MAX	1150	143	27	31	27	172	1080	74	286	26	8.8	2.9
MIN	8.1	22	22	20	14	8.6	15	12	1.8	.82	.00	.00
AC-FT	6060	2090	1480	1530	1160	1730	7820	2010	2440	381	65	78
DAL YR 1976	TOTAL	11835.46	MEAN	32.3	MAX	1200	MIN	.03	AC-FT	23480		
TR YR 1977	TOTAL	13536.50	MEAN	37.1	MAX	1150	MIN	.00	AC-FT	26850		

## COLORADO RIVER BASIN

08126500 COLORADO RIVER AT BALLINGER, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1961 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1961 to current year.

WATER TEMPERATURES: October 1961 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 13,500 micromhos May 3, 1963; minimum daily, 249 micromhos Aug. 14, 1963.

WATER TEMPERATURES: Maximum daily, 39.0°C July 3, 1977; minimum daily, 0.0°C Jan. 9-11, 1973.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,360 micromhos Aug. 28; minimum daily, 487 micromhos June 2.

WATER TEMPERATURES: Maximum daily, 39.0°C July 3; minimum daily, 2.0°C Jan. 10.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 31...	1030	300	996	8.2	12.0	260	140	50	33	100
NOV 30...	0815	20	1720	8.3	4.0	500	350	100	60	170
DEC 31...	1240	20	2140	8.3	5.0	660	520	140	76	200
FEB 28...	1730	16	2490	8.0	13.0	860	670	200	88	230
MAR 31...	1630	500	2050	8.1	17.0	550	370	120	60	180
MAY 16...	1456	31	1550	7.9	24.5	480	280	100	56	140
JUN 30...	0845	23	1160	7.8	--	290	150	78	22	98
JUL 31...	1440	1.1	2170	7.9	35.0	510	340	130	44	240
SEP 19...	1430	1.3	3620	7.4	29.0	1300	1200	280	150	320

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 31...	2.7	4.4	152	0	120	170	.4	8.6	561
NOV 30...	3.3	4.8	176	0	320	280	.5	11	1030
DEC 31...	3.4	4.9	174	0	460	340	.5	8.7	1320
FEB 28...	3.4	5.0	240	0	620	380	.7	5.7	1650
MAR 31...	3.4	4.4	220	0	360	280	.6	6.3	1120
MAY 16...	2.8	4.1	250	0	250	220	.7	11	905
JUN 30...	2.5	5.2	160	0	160	150	.5	8.8	601
JUL 31...	4.6	7.1	200	0	420	370	.6	17	1330
SEP 19...	3.8	7.7	140	0	1000	640	.7	22	2490

## 08126500 COLORADO RIVER AT BALLINGER, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA+MG) (MG/L)
OCT. 1976.....	3056.6	1200	740	6130	180	1500	180	1520	370
NOV. 1976.....	1053	1510	940	2660	230	661	260	737	470
DEC. 1976.....	745	2040	1280	2580	320	647	430	865	650
JAN. 1977.....	770	2270	1460	3040	360	748	540	1130	760
FEB. 1977.....	586	2370	1540	2440	380	595	590	928	810
MAR. 1977.....	874.6	2610	1740	4100	410	977	690	1640	930
APR. 1977.....	3945	1470	920	9750	220	2390	260	2740	460
MAY 1977.....	1012	1630	1020	2800	250	691	300	830	510
JUNE 1977.....	1230.5	1640	1050	3480	250	840	360	1180	510
JULY 1977.....	191.84	1900	1200	624	300	155	390	204	590
AUG. 1977.....	32.74	4070	2920	259	660	58	1370	121	1660
SEPT 1977.....	39.22	3600	2540	269	580	61	1150	122	1430
TOTAL .....	13536.48	**	**	38100	**	9320	**	12000	**
WTD.AVG. ....	37.09	1650	1000	**	250	**	330	**	510

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1720	1140	1850	2240	2360	2390	1820	1310	2120	1230	2100	3780
2	1580	1250	1900	2130	2390	2580	1830	1320	487	1270	2120	3720
3	1540	1360	1800	2250	2380	2560	1840	1350	1000	1420	2060	3580
4	1580	1390	1830	2230	2280	2580	1860	1360	1560	1480	2080	3560
5	1420	1410	1870	2260	2330	2560	1920	1380	1510	1540	2010	3510
6	1310	1480	1910	2290	2740	2500	1940	1380	1520	1670	---	3470
7	1290	1530	1850	2130	2340	2560	1990	1390	1550	1710	---	3490
8	1460	1550	1910	1860	2160	2420	2010	1380	1530	1820	---	3470
9	1230	1570	1910	2230	2190	2950	2030	1350	1640	1810	---	3440
10	1420	1590	1980	2280	2230	2530	2060	1450	1680	1950	---	3490
11	1660	1610	1950	2000	2270	2550	1990	1510	1750	2010	---	3580
12	1680	1640	1980	2250	2250	2540	1950	1470	1780	2050	---	3570
13	1790	1560	2020	2350	2330	2530	2000	1420	1850	2130	---	3630
14	1810	1590	2070	2260	2340	2590	2070	1450	1910	2430	---	3660
15	1970	1600	2060	2250	2390	2510	2200	1550	1970	2540	---	3690
16	2030	1590	2090	2240	2270	2630	1950	1430	2010	2650	---	3700
17	1560	1600	2070	2280	2410	2650	1110	1520	2060	2740	---	3700
18	1500	1610	2040	2170	2440	2640	1120	1620	2200	2840	---	3760
19	1810	1620	2070	2370	2320	2630	1620	1590	2250	2860	---	3730
20	1820	1640	2090	2700	2370	2640	1800	1660	2240	2920	---	3750
21	1840	1570	2060	2420	2350	2600	1500	1730	2250	2960	---	---
22	1810	1620	2130	2320	2310	2550	1060	1750	2230	2970	---	---
23	1830	1660	2200	2310	2460	2560	1210	1770	2290	1920	---	---
24	1920	1710	2210	2310	2520	2670	1280	2070	1500	1890	---	---
25	2010	1670	2200	2280	2540	2550	1290	1810	3090	2020	---	---
26	2000	1700	2210	2310	2650	2400	1320	1860	2030	2080	4310	---
27	1920	1720	2220	2260	2600	2590	1350	1870	2540	2100	4320	---
28	1810	2430	2200	2310	2550	3440	1340	1840	1700	2110	4360	---
29	1180	1730	2160	2350	---	2040	1380	1830	1350	2120	4220	---
30	1060	1780	2200	2310	---	1950	1340	1950	1160	2140	4190	---
31	1000	---	2220	2290	---	1810	---	2930	---	2160	3990	---
MEAN	1630	1600	2040	2270	2380	2540	1670	1620	1830	2110	3250	3610

COLORADO RIVER BASIN  
08126500 COLORADO RIVER AT BALLINGER, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27.0	12.0	5.0	3.0	6.5	10.0	14.0	27.0	27.0	32.0	29.0	28.0
2	24.0	---	6.0	4.0	9.0	16.0	16.0	24.0	27.0	30.0	31.5	26.5
3	26.0	14.0	7.0	4.0	9.0	14.0	20.0	26.0	26.0	39.0	31.0	30.5
4	22.0	14.0	---	6.0	8.0	15.0	---	24.0	30.0	---	33.0	27.0
5	20.0	14.0	8.0	6.0	10.0	14.0	17.0	24.0	21.0	30.0	32.0	30.0
6	---	17.0	9.0	---	11.0	14.0	15.0	26.0	26.0	30.0	---	28.0
7	15.0	17.0	6.0	6.0	10.0	15.0	17.0	27.5	25.0	28.0	---	---
8	15.0	13.0	8.0	7.0	9.0	16.0	17.0	26.0	25.0	30.0	---	32.0
9	19.0	16.0	8.0	2.5	---	16.0	21.0	28.0	25.0	33.0	---	29.0
10	20.0	14.0	9.0	2.0	10.0	17.0	20.0	25.0	26.5	31.0	---	29.5
11	19.0	15.0	8.0	3.0	13.0	---	19.0	22.0	31.0	28.0	---	29.0
12	18.0	10.0	8.0	5.0	15.0	---	17.0	22.0	29.0	28.0	---	29.0
13	21.0	6.0	7.0	8.0	14.0	17.0	17.0	22.5	---	27.0	---	29.0
14	18.5	7.0	8.5	6.0	11.0	14.0	18.0	24.0	27.0	30.0	---	28.0
15	21.0	8.0	8.5	7.0	12.0	17.0	17.0	26.0	27.0	30.0	---	24.0
16	18.0	6.5	7.0	5.0	11.0	19.0	16.0	24.0	28.0	31.0	---	28.0
17	18.0	8.0	7.0	4.0	14.0	18.0	15.0	23.0	30.0	31.0	---	24.0
18	16.0	8.0	10.0	5.0	12.0	15.0	16.0	23.0	30.0	30.0	---	28.5
19	18.0	9.0	12.0	4.0	15.0	19.0	20.0	24.0	28.0	31.0	---	26.0
20	17.0	14.0	9.0	7.0	18.0	16.0	---	23.0	29.0	30.0	---	25.0
21	14.5	12.0	7.0	6.0	15.0	16.0	20.0	21.0	28.0	30.0	---	---
22	14.0	10.0	8.0	10.0	14.0	13.0	18.0	26.0	27.0	33.0	---	---
23	18.0	9.0	5.0	9.0	14.0	15.0	23.0	24.0	26.0	29.0	---	---
24	19.0	11.0	---	10.0	15.0	14.0	23.0	24.0	25.0	33.5	---	---
25	16.0	13.5	10.0	9.0	15.0	17.0	20.0	24.0	29.0	32.0	---	---
26	---	13.0	9.0	9.0	13.0	18.0	20.0	27.0	30.0	32.0	---	---
27	14.0	10.0	8.0	10.0	11.0	17.0	21.0	28.0	27.0	29.5	30.0	---
28	11.0	7.0	---	10.0	13.0	15.0	22.0	29.0	---	---	29.0	---
29	10.0	4.5	9.0	6.0	---	16.0	21.5	27.0	32.0	33.0	29.0	---
30	11.0	4.0	9.0	---	---	19.0	23.0	30.0	---	32.0	28.0	---
31	12.0	---	5.0	5.0	---	17.0	---	27.0	---	35.0	27.0	---
MEAN	17.5	11.0	8.0	6.0	12.0	16.0	18.5	25.0	27.5	31.0	30.0	28.0



## COLORADO RIVER BASIN

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## 08127000 ELM CREEK AT BALLINGER, TX

LOCATION.--Lat 31°44'57", long 99°56'51", Runnels County, Hydrologic Unit 12090101, on right bank 1,000 ft (305 m) upstream from storage dam at Ballinger and 1.9 mi (3.1 km) upstream from mouth.

DRAINAGE AREA.--471 mi<sup>2</sup> (1,220 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1932 to current year.

REVISED RECORDS.--WSP 1442: 1935, 1946, 1954.

GAGE.--Water-stage recorder and masonry dam control. Datum of gage is 1,617.72 ft (493.081 m) above mean sea level.

REMARKS.--Water-discharge records good except those below 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s), which are fair. Stage-discharge relation during period of low flow affected by wind action and occasional accumulation of drift on dam. During the current year, records furnished by the city of Winters show they diverted 829 acre-ft (1.02 hm<sup>3</sup>) from Lake Winters, capacity, 3,060 acre-ft (3.77 hm<sup>3</sup>).

AVERAGE DISCHARGE.--45 years (water years 1933-77), 47.1 ft<sup>3</sup>/s (1.334 m<sup>3</sup>/s), 1.36 in/yr (35 mm/yr), 34,120 acre-ft/yr (42.1 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,000 ft<sup>3</sup>/s (1,420 m<sup>3</sup>/s) Oct. 13, 1957, gage height, 14.20 ft (4.328 m), from flood-mark; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1906 reached a stage of 14.5 ft (4.42 m), affected by backwater from Colorado River; highest stage not affected by backwater from Colorado River since at least 1904 was that of Oct. 13, 1957, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,330 ft<sup>3</sup>/s (66.0 m<sup>3</sup>/s) Oct. 30, gage height, 5.43 ft (1.655 m), no other peak above base of 2,100 ft<sup>3</sup>/s (59.5 m<sup>3</sup>/s); no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	12	163	22	12	14	13	23	67	11	8.9	.98	.01		
2	11	89	20	13	14	13	20	52	9.7	7.1	.63	.00		
3	9.9	68	20	14	13	13	19	40	9.0	5.8	.43	.00		
4	11	56	18	13	13	13	14	32	7.9	4.3	.26	.00		
5	11	51	13	14	14	13	16	27	7.4	4.0	.16	.00		
6	10	44	9.7	16	14	12	15	27	7.3	3.0	.10	.00		
7	17	40	9.7	16	14	12	14	25	6.8	2.4	.06	.00		
8	18	38	12	16	17	12	14	24	6.1	1.6	.03	.00		
9	23	34	12	14	15	12	14	22	5.8	1.1	.12	.00		
10	22	33	12	14	14	13	14	37	6.3	.73	.10	.00		
11	18	32	12	14	14	12	13	78	5.5	.42	.08	.00		
12	14	32	12	17	14	12	14	45	4.3	.27	.06	.00		
13	13	42	12	19	14	12	14	32	3.9	.22	.04	.00		
14	12	44	12	20	13	12	18	26	3.3	.22	.03	.00		
15	13	48	13	18	13	12	183	21	2.9	.15	.02	.00		
16	11	52	14	17	12	12	149	20	2.5	.10	.01	.00		
17	11	54	14	14	12	11	567	17	1.9	.04	.01	.00		
18	9.8	54	14	14	12	11	296	17	1.4	.02	.00	.00		
19	10	54	14	14	12	10	143	17	1.1	.01	.00	.00		
20	9.7	52	11	14	12	11	229	17	.89	.01	.00	.00		
21	9.4	46	12	14	12	10	270	16	.77	.03	.01	.00		
22	8.5	40	14	15	13	11	203	16	.80	.64	.02	.00		
23	8.9	38	14	15	7.9	11	107	16	1.3	.84	.04	.00		
24	9.4	36	14	17	13	12	75	16	103	53	.11	.00		
25	8.7	38	13	15	14	11	62	13	84	30	.15	.00		
26	9.2	32	14	14	12	15	47	12	68	20	.13	.00		
27	17	25	13	13	13	213	41	9.8	40	14	.09	.00		
28	27	28	13	14	14	131	35	9.5	23	11	.06	.00		
29	463	26	14	14	---	49	33	10	16	9.1	.04	.00		
30	1700	24	13	14	---	33	63	12	11	5.6	.03	.00		
31	455	---	12	14	---	26	---	9.3	---	1.4	.02	---		
TOTAL	2982.5	1413	422.4	462	368.9	763	2725	782.6	452.86	332.52	3.82	.01		
MEAN	96.2	47.1	13.6	14.9	13.2	24.6	90.8	25.2	15.1	10.7	.12	.000		
MAX	1700	163	22	20	17	213	567	78	103	84	.98	.01		
MIN	8.5	24	9.7	12	7.9	10	13	9.3	.77	.01	.00	.00		
CFSM	.20	.10	.03	.03	.03	.05	.19	.05	.03	.02	.000	.000		
IN.	.24	.11	.03	.04	.03	.06	.22	.06	.04	.03	.00	.00		
AC-FT	5920	2800	838	916	732	1510	5410	1550	898	660	7.6	.02		
CAL YR 1976	TOTAL	11964.57	MEAN	32.7	MAX	2140	MIN	.04	CFSM	.07	IN	.94	AC-FT	23730
WTR YR 1977	TOTAL	10708.61	MEAN	29.3	MAX	1700	MIN	.00	CFSM	.06	IN	.85	AC-FT	21240

## COLORADO RIVER BASIN

08127000 ELM CREEK AT BALLINGER, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1967 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to current year.

WATER TEMPERATURES: October 1967 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,220 micromhos Sept. 12, 17, 1970; minimum daily, 306 micromhos Sept. 19, 1974.

WATER TEMPERATURES: Maximum daily, 34.5°C Aug. 14, 1973; minimum daily, 0.0°C Jan. 8, 1968, Jan. 10, 13, 1973.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 3,100 micromhos Mar. 22, 26; minimum daily, 529 micromhos Oct. 31.

WATER TEMPERATURES: Maximum daily, 34.0°C July 31; minimum daily, 0.5°C Jan. 9, 10.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DTS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)
OCT										
31...	1040	400	539	8.1	11.0	180	59	48	15	32
NOV										
30...	0800	24	2330	8.4	3.5	580	470	87	88	260
JAN										
13...	1340	19	2730	8.1	4.5	800	550	140	110	300
FEB										
28...	0800	14	2840	8.0	9.0	750	550	120	110	320
MAR										
31...	1620	22	1500	8.0	15.0	390	250	81	45	150
MAY										
16...	1340	21	2010	7.9	24.5	520	270	98	66	220
JUN										
28...	1140	25	839	7.7	29.0	260	110	58	28	60
JUL										
31...	1430	1.4	796	7.8	34.0	250	100	50	31	61
SEP										
04...	1030	.01	1100	8.0	28.0	370	160	77	43	85

DATE	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DTS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT									
31...	1.0	5.2	150	0	37	66	.2	10	287
NOV									
30...	4.7	5.0	128	4	280	510	.7	12	1310
JAN									
13...	4.6	3.8	310	0	330	550	.9	7.8	1600
FEB									
28...	5.1	4.0	250	0	360	610	1.0	7.5	1660
MAR									
31...	3.3	5.5	170	0	180	280	.6	11	837
MAY									
16...	4.2	5.2	300	0	200	370	.9	11	1120
JUN									
28...	1.6	6.6	180	0	85	120	.4	8.7	455
JUL									
31...	1.7	6.5	180	0	80	110	.4	6.6	434
SEP									
04...	1.9	6.9	250	0	120	170	.6	15	641

## COLORADO RIVER BASIN

77

08127000 ELM CREEK AT BALLINGER, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	2982.5	757	450	3600	130	1040	67	541	230
NOV. 1976.....	1413	1660	980	3740	330	1270	200	762	490
DEC. 1976.....	422.4	2580	1520	1730	540	617	370	420	740
JAN. 1977.....	462	2660	1570	1960	560	700	390	485	770
FEB. 1977.....	368.9	2750	1620	1610	580	577	410	406	790
MAR. 1977.....	763	2420	1420	2930	510	1040	340	700	700
APR. 1977.....	2725	1280	750	5530	250	1810	130	956	380
MAY 1977.....	782.6	2110	1240	2630	440	920	270	567	610
JUNE 1977.....	452.86	1680	990	1220	340	414	200	246	490
JULY 1977.....	332.52	1180	690	624	230	203	120	105	350
AUG. 1977.....	3.82	895	530	5.2	160	1.6	73	0.8	270
SEPT 1977.....	0	1060	620	0.02	200	0	97	3390	310
TOTAL .....	10708.58	**	**	25600	**	8590	**	5190	**
WTD.AVG. ....	29.34	1500	880	**	300	**	180	**	440

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	743	739	2550	2620	2610	2860	1470	1990	2380	875	804	1060
2	764	780	2390	2680	2720	2900	1490	2220	2390	856	810	---
3	831	817	2510	2660	2740	2870	1650	2330	2450	877	816	---
4	974	902	2460	2650	2660	2900	1620	2250	2470	915	819	---
5	904	1040	2420	2640	2720	2830	1750	2190	2520	947	844	---
6	960	1190	2510	2630	2620	2920	1710	2150	2490	943	845	---
7	1010	1340	2590	2620	2690	2940	1810	2120	2540	947	847	---
8	1080	1420	2490	2580	2720	2960	1850	2100	2560	986	884	---
9	1380	1590	2640	2530	2700	2460	1930	2120	2510	977	871	---
10	1530	1640	2540	2710	2720	2960	1960	2160	2610	964	895	---
11	1670	1720	2590	2640	2680	2990	2000	2260	2700	990	874	---
12	1800	1830	2630	2720	2750	3010	2060	2320	2670	1000	920	---
13	1860	1910	2670	2730	2770	3030	2090	2220	2660	1020	957	---
14	1900	2020	2570	2710	2750	3020	2130	1980	2680	1060	935	---
15	1910	2130	2610	2690	2780	3010	1750	1860	2670	1100	902	---
16	1930	2150	2670	2740	2760	3020	1050	1830	2700	1180	906	---
17	1940	2130	2610	2760	2810	3030	1090	1790	2730	1090	945	---
18	1840	2170	2640	2700	2760	2880	1060	1760	2740	1100	---	---
19	1900	2210	2570	2730	2640	3040	1030	1770	2740	1170	---	---
20	1920	2310	2650	2280	2790	3060	1150	1810	2790	1180	---	---
21	1960	2300	2660	2450	2800	3080	1260	1820	2860	1140	1020	---
22	1950	2360	2670	2690	2820	3100	1450	1970	2790	1340	961	---
23	2000	2320	2540	2650	2780	3080	1170	1960	2800	1720	1100	---
24	2010	2330	2600	2700	2800	3070	1190	1800	2050	923	1350	---
25	2020	2320	2660	2710	2850	3090	1230	2100	1640	881	1590	---
26	2030	2330	2570	2700	2860	3100	1340	2200	913	846	1000	---
27	2010	2370	2550	2750	2880	2400	1420	2240	878	814	1010	---
28	2030	1710	2560	2710	2870	1970	1460	2310	839	810	1040	---
29	1010	2450	2580	2700	---	1450	1590	2340	827	808	1060	---
30	571	2520	2690	2720	---	1430	1750	2310	895	787	1040	---
31	529	---	2640	2710	---	1450	---	2320	---	793	1020	---
MEAN	1520	1830	2580	2660	2750	2770	1550	2080	2280	1000	967	---

COLORADO RIVER BASIN  
08127000 ELM CREEK AT BALLINGER, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25.5	10.0	4.0	2.0	6.0	9.5	14.5	25.0	28.0	31.0	30.0	28.0
2	23.5	---	4.5	4.5	8.5	16.0	17.0	20.0	27.0	31.0	32.0	---
3	25.5	12.0	5.0	3.0	8.0	12.0	19.5	24.5	28.0	29.0	31.0	---
4	21.0	11.5	---	4.0	5.0	15.5	---	24.0	30.0	---	33.0	---
5	21.0	10.5	7.0	4.5	9.0	14.0	20.0	24.0	32.0	29.0	31.0	---
6	---	16.5	6.5	---	10.0	15.5	15.5	25.0	26.0	30.0	31.0	---
7	16.0	14.5	4.0	4.0	8.5	18.0	15.5	26.5	26.0	27.0	31.0	---
8	16.5	12.0	5.0	3.5	8.0	16.0	16.0	27.0	25.0	29.0	30.0	---
9	21.0	15.5	5.5	0.5	---	14.5	20.5	29.0	25.0	33.0	29.0	---
10	23.5	12.0	6.5	0.5	9.5	15.5	20.0	25.5	26.0	31.0	31.0	---
11	21.0	13.0	5.0	1.0	13.0	---	17.0	23.0	30.0	27.0	31.0	---
12	16.0	7.0	7.0	4.0	12.0	---	15.5	22.0	28.0	26.5	---	---
13	19.0	7.0	5.5	4.5	13.5	15.5	16.0	22.0	---	26.0	32.0	---
14	16.5	6.5	6.5	4.5	10.0	13.5	17.0	24.5	26.0	30.0	30.0	---
15	22.0	7.0	6.0	5.5	12.0	14.5	16.5	25.5	26.0	30.0	31.0	---
16	16.5	5.5	5.5	4.5	13.0	15.5	15.5	23.5	28.0	33.0	27.0	---
17	18.5	6.5	4.5	2.0	14.5	18.0	16.5	23.0	31.0	32.0	32.0	---
18	15.5	6.0	8.5	1.5	10.0	14.0	17.0	23.0	30.0	30.0	---	---
19	15.5	10.5	10.5	2.0	14.0	19.0	18.5	23.5	26.0	31.0	---	---
20	18.0	11.0	7.0	1.5	18.5	15.5	---	23.0	29.0	31.0	---	---
21	13.0	10.0	6.0	3.0	14.5	15.5	19.0	21.0	28.0	30.0	29.0	---
22	14.0	9.0	6.5	5.0	13.0	13.0	16.5	25.0	26.0	33.0	28.0	---
23	14.5	8.5	4.5	7.0	13.0	14.5	21.0	23.5	26.0	27.0	---	---
24	18.5	10.0	---	8.5	16.0	13.5	21.5	23.0	26.0	32.0	31.0	---
25	15.0	12.0	8.0	6.5	16.0	15.5	19.5	23.0	29.0	31.5	27.0	---
26	---	13.0	10.5	7.0	12.0	18.0	20.0	27.0	30.0	33.0	28.0	---
27	14.0	8.5	7.0	9.5	11.0	16.5	20.0	27.0	27.5	29.0	30.0	---
28	12.0	4.5	---	7.0	9.0	15.5	20.5	29.0	---	---	29.0	---
29	11.0	3.5	8.5	7.0	---	15.0	21.0	27.0	30.0	33.0	28.0	---
30	10.0	3.5	9.0	---	---	19.0	26.5	29.5	29.0	32.0	26.0	---
31	11.0	---	6.5	5.5	---	15.0	---	27.0	---	34.0	26.0	---
MEAN	17.5	9.5	6.5	4.5	11.5	15.5	18.5	24.5	28.0	30.5	30.0	---

## COLORADO RIVER BASIN

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## 08127500 SOUTH CONCHO IRRIGATION CO.'S CANAL AT CHRISTOVAL, TX

LOCATION.--Lat 31°11'17", long 100°29'59", Tom Green County, Hydrologic Unit 12090102, on right bank at Christoval, 85 ft (26 m) downstream from point of diversion, and 100 ft (30 m) downstream from bridge on U.S. Highway 277.

PERIOD OF RECORD.--November 1939 to current year.

REVISED RECORDS.--WSP 1312: 1940-46.

GAGE.--Water-stage recorder. Datum of gage is 2,017.02 ft (614.788 m) above mean sea level.

REMARKS.--Records good. The following table lists only irrigation water diverted from right bank of South Concho River 600 ft (180 m) upstream from station at Christoval (station 08128000). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--37 years (water years 1941-77), 6.76 ft<sup>3</sup>/s (0.191 m<sup>3</sup>/s), 4,900 acre-ft/yr (6.04 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily diversion for irrigation (excluding floodflow), 21 ft<sup>3</sup>/s (0.59 m<sup>3</sup>/s) June 27, 28, 1941, Sept. 18, 21, 1942; no flow Apr. 26 to July 9, 1957, Mar. 18 to Apr. 10, 1958, Oct. 19 to Nov. 2, 1966.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	3.7	2.8	3.2	2.2	4.9	4.6	5.0	6.4	4.3	3.4	10
2	4.8	3.5	2.8	3.2	2.2	4.8	4.4	5.5	6.3	4.2	3.3	5.0
3	4.8	3.3	2.8	3.1	2.2	4.8	4.4	5.6	6.3	4.1	3.3	6.6
4	5.4	3.2	2.8	3.1	2.2	4.7	4.4	5.8	6.3	4.0	3.3	14
5	5.5	3.1	2.8	3.0	2.2	4.6	4.4	6.2	6.3	3.9	6.0	14
6	5.4	3.2	2.8	3.0	2.2	4.6	5.0	6.1	6.3	3.9	15	14
7	5.6	6.1	2.6	3.5	2.1	4.5	5.1	6.0	6.3	3.9	15	14
8	5.5	6.1	2.6	5.3	2.1	4.5	5.5	6.1	6.3	3.9	15	14
9	5.5	6.1	2.5	2.7	2.1	4.5	6.6	6.0	6.3	3.8	15	14
10	5.3	5.4	2.5	2.6	2.0	4.5	5.0	6.0	6.3	3.8	15	14
11	5.4	1.3	2.4	2.4	1.9	4.5	4.1	6.0	6.3	3.8	15	14
12	5.3	1.5	2.4	2.3	2.9	4.3	5.6	6.0	6.3	3.7	15	14
13	5.4	2.5	2.5	2.3	3.1	4.2	8.3	6.1	6.4	3.7	15	14
14	5.4	2.8	2.5	2.3	3.2	3.9	8.2	6.0	5.9	3.7	15	13
15	5.6	2.8	2.3	2.4	3.2	3.8	8.0	6.0	5.2	3.7	15	14
16	5.7	2.8	2.1	2.3	3.3	3.5	7.0	6.0	7.6	4.3	15	14
17	5.7	2.8	2.1	2.3	3.3	3.2	6.0	6.0	7.6	3.8	14	14
18	6.0	2.8	2.1	2.3	4.0	3.0	5.6	6.0	7.5	3.7	14	14
19	6.1	2.8	2.0	2.4	4.6	3.1	5.2	6.0	7.5	3.7	14	14
20	6.1	2.8	1.9	2.3	3.9	3.2	4.9	6.0	6.7	3.6	12	14
21	6.1	2.8	1.9	2.5	3.8	3.1	4.8	5.8	4.8	3.6	6.0	14
22	6.1	2.8	2.0	2.5	3.7	3.1	4.7	5.5	4.9	3.5	5.9	14
23	6.3	2.8	2.2	2.4	3.8	3.7	4.7	5.2	4.9	5.0	5.7	14
24	4.9	2.8	2.2	2.4	5.8	7.0	4.7	5.1	4.8	6.1	5.7	14
25	3.4	2.8	2.1	2.4	6.4	6.6	4.8	5.3	4.7	7.2	5.6	14
26	3.4	2.8	2.3	2.3	5.2	5.1	4.8	5.3	4.6	6.6	5.4	14
27	3.6	2.8	5.0	2.3	5.0	5.1	4.7	5.2	4.5	3.6	5.3	11
28	3.8	2.8	4.8	2.3	5.0	4.8	4.5	5.2	4.5	3.4	5.2	6.2
29	8.0	2.8	4.0	2.3	---	4.8	4.4	5.2	4.4	3.4	5.4	6.3
30	7.2	2.8	3.7	2.3	---	4.8	4.5	5.8	4.4	3.5	7.1	4.5
31	4.0	---	3.3	2.3	---	4.7	---	6.5	---	3.3	9.0	---
TOTAL	166.1	96.6	82.8	82.0	93.6	135.9	158.9	178.5	176.6	126.7	304.6	370.6
MEAN	5.36	3.22	2.67	2.65	3.34	4.38	5.30	5.76	5.89	4.09	9.83	12.4
MAX	8.0	6.1	5.0	5.3	6.4	7.0	8.3	6.5	7.6	7.2	15	14
MIN	3.4	1.3	1.9	2.3	1.9	3.0	4.1	5.0	4.4	3.3	3.3	4.5
AC-FT	329	192	164	163	186	270	315	354	350	251	604	735
CAL YR 1976	TOTAL	2016.6	MEAN 5.51	MAX 9.6	MIN 1.3	AC-FT 4000						
WTR YR 1977	TOTAL	1972.9	MEAN 5.41	MAX 15	MIN 1.3	AC-FT 3910						



## COLORADO RIVER BASIN

## 08128000 SOUTH CONCHO RIVER AT CHRISTOVAL, TX

LOCATION.--Lat 31°11'15", long 100°30'06", Tom Green County, Hydrologic Unit 12090102, near center of stream on downstream side of center pier of Panhandle and Santa Fe Railway Co. bridge at Christoval, 9.5 mi (15.3 km) upstream from Twin Buttes Dam, and 85.0 mi (136.8 km), revised, upstream from mouth.

DRAINAGE AREA.--409 mi<sup>2</sup> (1,059 km<sup>2</sup>), of which 65 mi<sup>2</sup> (168 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--February 1930 to current year.

REVISED RECORDS.--WSP 1118: 1943(M). WSP 1922: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 2,010.22 ft (612.715 m) above mean sea level. Prior to July 17, 1930, nonrecording gage at same site and datum.

REMARKS.--Records good. Low flow is materially affected by diversion to South Concho Irrigation Co.'s canal (station 08127500) 600 ft (180 m) upstream from station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--47 years, 33.8 ft<sup>3</sup>/s (0.957 m<sup>3</sup>/s), 24,490 acre-ft/yr (30.2 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 100,000 ft<sup>3</sup>/s (2,830 m<sup>3</sup>/s) July 23, 1938, gage height, 21.95 ft (6.690 m), from flood-mark, from rating curve extended above 15,100 ft<sup>3</sup>/s (428 m<sup>3</sup>/s) on basis of slope-area measurement of 80,100 ft<sup>3</sup>/s (2,270 m<sup>3</sup>/s); no flow Feb. 28, Mar. 1, 1955.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1882, about 23 ft (7.0 m) Aug. 6, 1906, discharge 115,000 ft<sup>3</sup>/s (3,260 m<sup>3</sup>/s), from rating curve as noted above, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 160 ft<sup>3</sup>/s (4.53 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 29	1445	454	12.9	May 11	0800	1,160	4.39
Apr. 15	0930	*7,620	216				1.338
			9.31				

Minimum discharge, 33 ft<sup>3</sup>/s (0.93 m<sup>3</sup>/s) Sept. 4, 5, 16, 20-27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	75	80	63	54	44	43	98	71	59	52	39
2	60	77	79	63	54	45	44	95	71	56	52	45
3	59	79	79	63	54	45	43	96	71	56	51	44
4	63	81	79	63	54	44	43	96	71	56	50	34
5	62	82	79	61	54	45	43	96	66	56	48	35
6	59	84	78	61	54	44	43	96	66	56	39	38
7	61	80	76	61	55	44	43	93	66	56	40	37
8	60	81	76	57	55	43	41	91	65	56	39	37
9	59	82	75	61	54	44	39	90	65	56	39	37
10	59	83	76	61	54	44	41	94	64	54	39	38
11	59	90	74	61	54	44	41	467	63	54	39	38
12	58	91	73	61	52	44	39	152	65	54	39	36
13	58	90	74	61	52	44	36	95	63	54	40	37
14	58	90	73	61	50	44	36	90	64	54	39	35
15	59	90	72	61	50	45	1920	90	65	52	39	36
16	58	89	71	60	50	44	452	90	62	54	39	35
17	56	87	71	61	49	45	254	87	61	54	39	35
18	56	87	71	60	48	45	91	87	59	53	39	37
19	57	87	71	59	46	45	88	87	56	52	39	36
20	56	87	70	59	47	45	91	87	59	54	41	35
21	56	87	68	59	47	45	93	87	59	55	47	35
22	56	86	68	60	47	44	93	82	59	55	47	34
23	56	86	68	59	47	43	94	82	61	52	47	35
24	55	87	68	56	45	39	94	79	61	50	47	33
25	54	87	67	56	43	39	95	79	59	47	47	34
26	54	85	66	56	45	44	98	79	59	47	46	34
27	57	82	62	56	45	44	98	79	59	52	46	36
28	59	82	62	55	45	43	97	79	56	50	47	41
29	197	81	63	54	---	43	98	76	56	52	47	42
30	120	81	63	56	---	42	101	73	56	52	44	44
31	78	---	63	56	---	42	---	71	---	52	41	---
TOTAL	2018	2536	2215	1841	1404	1355	4432	3143	1878	1660	1348	1112
MEAN	65.1	84.5	71.5	59.4	50.1	43.7	148	101	62.6	53.5	43.5	37.1
MAX	197	91	80	63	55	45	1920	467	71	59	52	45
MIN	54	75	62	54	43	39	36	71	56	47	39	33
AC-FT	4000	5030	4390	3650	2780	2690	8790	6230	3730	3290	2670	2210
CAL YR 1976	TOTAL	17285	MEAN 47.2	MAX 397	MIN 26	AC-FT 34280						
WTR YR 1977	TOTAL	24942	MEAN 68.3	MAX 1920	MIN 33	AC-FT 49470						

COLORADO RIVER BASIN

81

08128400 MIDDLE CONCHO RIVER ABOVE TANKERSLEY, TX

LOCATION.--Lat 31°25'38", long 100°42'39", Irion County, Hydrologic Unit 12090103, on left bank 0.3 mi (0.5 km) upstream from East Rocky Creek, 0.5 mi (0.8 km) southwest of Tullios Ranch headquarters, 6.7 mi (10.8 km) northwest of Tankersley, and 20.9 mi (33.6 km) upstream from mouth.

DRAINAGE AREA.--2,436 mi<sup>2</sup> (6,309 km<sup>2</sup>), of which 1,055 mi<sup>2</sup> (2,732 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--March 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,986.47 ft (605.476 m) above mean sea level.

REMARKS.--Records good. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--16 years, 18.0 ft<sup>3</sup>/s (0.510 m<sup>3</sup>/s), 13,040 acre-ft/yr (16.1 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,500 ft<sup>3</sup>/s (439 m<sup>3</sup>/s) Sept. 21, 1974, gage height, 24.98 ft (7.614 m); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1900, 29.5 ft (8.99 m) Sept. 26, 1936. A flood in 1900 reached the same stage, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 507 ft<sup>3</sup>/s (14.4 m<sup>3</sup>/s) June 26, gage height, 9.34 ft (2.847 m), no peak above base of 1,700 ft<sup>3</sup>/s (48.1 m<sup>3</sup>/s); no flow Sept. 25-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	16	13	16	17	15	15	16	10	7.8	1.8	.73
2	4.6	14	13	16	17	14	15	15	10	7.4	1.7	.83
3	4.6	13	13	17	17	14	14	15	9.6	6.8	1.4	.77
4	4.4	12	14	17	16	14	13	14	8.8	6.0	1.1	.74
5	6.7	11	13	17	16	15	13	13	7.9	5.5	.84	.63
6	6.3	11	14	17	16	14	13	14	7.3	4.9	.66	1.4
7	6.7	11	14	17	16	14	13	15	6.9	4.5	.58	1.2
8	7.0	11	14	17	16	14	13	14	6.6	4.2	.49	1.3
9	6.6	11	15	17	16	15	13	15	6.3	4.0	.34	1.6
10	6.5	11	15	17	16	15	13	14	5.3	4.0	.24	1.3
11	5.5	11	15	16	16	14	13	45	4.9	3.7	.21	1.3
12	5.2	11	15	17	16	15	13	33	4.9	3.4	.22	1.7
13	4.8	12	15	18	15	15	14	31	5.7	3.2	.48	1.5
14	4.6	12	15	19	15	15	22	25	5.6	2.7	.47	1.2
15	4.9	12	16	18	15	15	32	22	5.5	2.2	.88	1.3
16	4.9	12	15	18	15	14	27	20	5.1	1.9	1.5	1.2
17	5.3	12	15	18	15	15	27	20	4.8	1.8	1.5	1.1
18	5.8	12	16	18	15	15	21	20	4.2	1.6	1.4	.96
19	5.9	13	16	17	15	14	18	18	3.6	1.5	1.4	1.0
20	5.6	13	16	17	13	14	17	18	3.2	1.5	1.2	1.0
21	5.6	13	16	17	13	14	16	18	3.1	2.7	1.3	.94
22	5.5	13	15	17	14	14	15	16	3.6	5.1	1.3	.78
23	5.6	13	16	18	14	14	15	16	6.0	3.6	1.4	.66
24	5.9	13	16	18	13	14	15	15	8.4	2.7	1.5	.31
25	6.6	14	16	18	14	14	15	15	8.2	2.3	1.4	.00
26	6.6	14	16	18	14	17	14	14	123	2.0	1.1	.00
27	7.6	14	16	17	14	25	13	15	23	1.8	.90	.00
28	12	14	16	16	15	23	13	14	13	1.5	.79	.00
29	80	13	16	16	---	20	14	13	9.8	1.8	.77	.00
30	39	13	16	16	---	17	16	12	8.3	2.2	.72	.00
31	21	---	16	17	---	16	---	11	---	2.1	.59	---
TOTAL	306.2	375	467	532	424	478	485	556	332.6	106.4	30.18	25.45
MEAN	9.88	12.5	15.1	17.2	15.1	15.4	16.2	17.9	11.1	3.43	.97	.85
MAX	80	16	16	19	17	25	32	45	123	7.8	1.8	1.7
MIN	4.4	11	13	16	13	14	13	11	3.1	1.5	.21	.00
AC-FT	607	744	926	1060	841	948	962	1100	660	211	60	50
CAL YR 1976	TOTAL	5827.09	MEAN	15.9	MAX	856	MIN	.04	AC-FT	11560		
WTR YR 1977	TOTAL	4117.83	MEAN	11.3	MAX	123	MIN	.00	AC-FT	8170		

## COLORADO RIVER BASIN

08129300 SPRING CREEK ABOVE TANKERSLEY, TX

LOCATION.--Lat 31°19'48", long 100°38'24", Tom Green County, Hydrologic Unit 12090102, on right bank at downstream side of bridge on Farm Road 2335, 1.4 mi (2.3 km) south of Tankersley, and 2.5 mi (4.0 km) upstream from Dove Creek.

DRAINAGE AREA.--424 mi<sup>2</sup> (1,098 km<sup>2</sup>), of which 28 mi<sup>2</sup> (73 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--October 1960 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,964.72 ft (598.847 m) above mean sea level. Prior to Nov. 10, 1960, nonrecording gage at same site and datum.

REMARKS.--Records good. Many small diversions above station for irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years, 15.3 ft<sup>3</sup>/s (0.433 m<sup>3</sup>/s), 11,080 acre-ft/yr (13.7 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,400 ft<sup>3</sup>/s (861 m<sup>3</sup>/s) Aug. 12, 1971, gage height, 16.57 ft (5.051 m); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Outstanding floods since at least 1853 occurred in 1882 and 1884. Flood of Oct. 3, 1959, reached a stage of 18.4 ft (5.61 m), from floodmarks. At former gage near Tankersley 8 mi (13 km) downstream, the flood of Oct. 3, 1959, had a discharge of 82,100 ft<sup>3</sup>/s (2,330 m<sup>3</sup>/s) and was found to be about 3 ft (0.9 m) lower than the 1882 flood, the greatest at that location since at least 1853.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft<sup>3</sup>/s (11.3 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 15	1630	8,230 233	10.30 3.139	May 11	0530	*8,770 248	10.52 3.206

Minimum discharge, 3.5 ft<sup>3</sup>/s (0.10 m<sup>3</sup>/s) Feb. 24, Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	23	22	20	19	17	17	14	29	19	5.4	9.1
2	14	23	21	21	19	17	16	14	28	20	8.3	9.9
3	15	21	21	21	19	15	15	13	28	18	11	12
4	18	21	21	18	17	15	13	13	24	16	13	13
5	20	21	22	17	18	15	18	15	24	18	13	12
6	16	22	22	20	20	14	19	17	24	16	13	13
7	16	20	22	19	20	13	17	16	17	16	15	13
8	15	22	22	20	21	11	14	16	15	12	11	13
9	15	21	22	19	20	11	12	16	11	11	10	9.2
10	15	22	21	20	20	11	11	17	13	13	8.3	7.8
11	15	22	21	21	21	11	12	2860	19	10	8.3	12
12	15	21	21	22	19	10	12	115	21	8.7	11	10
13	15	24	22	22	19	10	12	49	18	9.9	13	8.6
14	15	25	23	21	19	9.6	19	33	10	10	13	6.6
15	16	25	22	21	20	8.1	2550	50	11	8.6	15	11
16	15	25	21	20	20	9.0	165	42	13	9.4	15	8.0
17	15	24	20	20	20	10	42	39	10	9.8	13	6.7
18	16	24	22	19	20	11	29	38	15	10	13	7.7
19	15	23	22	19	17	11	19	36	14	11	11	5.7
20	14	23	20	19	16	11	17	36	12	12	6.6	8.5
21	14	21	20	18	17	12	13	34	12	14	6.5	8.3
22	15	22	20	21	17	9.8	12	32	13	16	13	8.6
23	16	22	21	22	13	9.1	12	32	20	14	13	11
24	18	20	21	20	14	10	12	28	27	15	10	11
25	18	23	19	19	19	11	12	34	24	14	8.1	9.1
26	16	23	20	17	18	18	12	28	23	12	5.6	8.3
27	18	20	20	16	18	21	12	26	23	12	7.6	7.9
28	31	20	17	15	18	17	12	28	20	11	8.9	6.1
29	51	21	18	18	---	15	12	30	19	12	7.9	4.2
30	33	21	18	19	---	16	19	29	15	10	11	3.9
31	26	---	18	19	---	16	---	29	---	5.5	11	---
TOTAL	565	665	642	603	518	394.6	3157	3779	552	393.9	329.5	275.2
MEAN	18.2	22.2	20.7	19.5	18.5	12.7	105	122	18.4	12.7	10.6	9.17
MAX	51	25	23	22	21	21	2550	2860	29	20	15	13
MIN	14	20	17	15	13	8.1	11	13	10	5.5	5.4	3.9
AC-FT	1120	1320	1270	1200	1030	783	6260	7500	1090	781	654	546
CAL YR 1976	TOTAL	5735.58	MEAN	15.7	MAX	64	MIN	.74	AC-FT	11380		
WTR YR 1977	TOTAL	11874.20	MEAN	32.5	MAX	2860	MIN	3.9	AC-FT	23550		

## COLORADO RIVER BASIN

83

08130500 DOVE CREEK AT KNICKERBOCKER, TX

LOCATION.--Lat 31°16'24", long 100°37'45", Tom Green County, Hydrologic Unit 12090102, on right bank at right end of bridge on Farm Road 2335, 0.4 mi (0.6 km) west of Knickerbocker, and 5.4 mi (8.7 km) upstream from mouth.

DRAINAGE AREA.--229 mi<sup>2</sup> (593 km<sup>2</sup>), of which 31 mi<sup>2</sup> (80.3 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--October 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,001.45 ft (610.042 m) above mean sea level. Prior to Nov. 10, 1960, nonrecording gage at present site and datum.

REMARKS.--Records good. Flow is partly regulated by storage and diversion from two small channel dams upstream and by small diversions upstream for irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years, 17.7 ft<sup>3</sup>/s (0.501 m<sup>3</sup>/s), 12,820 acre-ft/yr (15.8 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,500 ft<sup>3</sup>/s (496 m<sup>3</sup>/s) Aug. 12, 1971, gage height, 20.66 ft (6.297 m); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1882, 30.4 ft (9.27 m) in 1906 and Oct. 3, 1959; floods in 1882 and 1884 reached about the same stage, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 15	1200	5,040 143	12.95 3.947	May 11	0500	*12,200 346	17.74 5.407

Minimum discharge, 20 ft<sup>3</sup>/s (0.57 m<sup>3</sup>/s) Apr. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	39	37	36	33	29	24	34	45	38	33	33
2	35	39	37	36	33	28	24	34	45	39	33	30
3	35	39	37	36	33	28	22	34	46	38	31	27
4	37	39	37	36	32	28	22	34	49	36	30	28
5	37	39	37	36	32	28	22	34	47	36	30	27
6	36	39	36	36	32	28	21	34	47	37	30	27
7	36	39	36	36	31	28	22	34	46	36	30	27
8	36	39	36	36	32	27	23	34	46	37	32	28
9	36	39	36	36	32	27	22	34	45	37	32	27
10	35	39	37	35	31	27	22	34	45	38	31	28
11	36	39	36	36	31	26	22	3670	45	38	31	28
12	36	39	36	36	31	26	22	110	44	37	31	29
13	35	40	36	36	31	26	23	57	44	38	31	29
14	36	40	37	36	30	26	29	52	44	38	31	28
15	36	40	36	35	30	26	1260	54	43	36	32	29
16	36	40	36	35	30	25	105	53	42	36	30	28
17	36	39	36	35	30	26	44	52	41	37	29	26
18	36	39	36	34	30	26	40	52	39	37	29	27
19	36	39	36	34	30	25	39	50	39	36	29	31
20	37	39	36	34	30	25	39	51	40	37	30	29
21	36	38	36	34	30	24	37	54	38	37	29	30
22	36	38	36	34	30	25	36	49	39	38	29	29
23	36	38	36	35	30	25	36	49	40	37	30	30
24	36	38	36	34	30	25	36	48	41	36	30	30
25	36	38	36	34	29	24	36	48	39	34	29	32
26	36	38	36	33	29	26	36	48	38	34	31	35
27	39	37	36	33	30	27	36	48	37	35	29	34
28	41	37	36	32	29	26	35	47	37	36	31	33
29	58	37	36	32	---	25	34	47	36	36	33	32
30	42	37	36	33	---	24	36	46	35	35	33	31
31	40	---	36	34	---	24	---	46	---	34	33	---
TOTAL	1154	1160	1123	1078	861	810	2205	5071	1262	1134	952	882
MEAN	37.2	38.7	36.2	34.8	30.8	26.1	73.5	164	42.1	36.6	30.7	29.4
MAX	58	40	37	36	33	29	1260	3670	49	39	33	35
MIN	35	37	36	32	29	24	21	34	35	34	29	26
AC-FT	2290	2300	2230	2140	1710	1610	4370	10060	2500	2250	1890	1750

CAL YR 1976	TOTAL	11859	MEAN	32.4	MAX	310	MIN	14	AC-FT	23520
WTR YR 1977	TOTAL	17692	MEAN	48.5	MAX	3670	MIN	21	AC-FT	35090

## 08131200 TWIN BUTTES RESERVOIR NEAR SAN ANGELO, TX

LOCATION.--Lat 31°22'59", long 100°32'11", Tom Green County, Hydrologic Unit 12090102, in outlet control tower at Twin Buttes Dam on Middle Concho River, Spring Creek, and South Concho River, 3.8 mi (6.1 km) upstream from Lake Nasworthy Dam, 8.1 mi (13.0 km) southwest of San Angelo, and 75.0 mi (120.7 km) upstream from mouth.

DRAINAGE AREA.--3,724 mi<sup>2</sup> (9,645 km<sup>2</sup>), of which 1,178 mi<sup>2</sup> (3,051 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder on Middle Concho-Spring Creek pool and nonrecording gage on South Concho pool. Datum of gages is at mean sea level.

REMARKS.--The reservoir is formed by a rolled earthfill dam 8.1 miles (13.0 km) long, including a 200-foot-wide (61 m) uncontrolled off-channel concrete gravity spillway with ogee weir section. Outlet works consist of three 15.5-foot (4.7-meter) concrete conduits, each is controlled by a 12.0- by 15.0-foot (3.7- by 4.6-meter) fixed-wheel gate and a 12.0- by 15.0-foot (3.7- by 4.6-meter) radial gate, located in Middle Concho-Spring Creek pool. Low-flow releases are made through 2.0- by 2.0-foot (0.6- by 0.6-meter) gates located in the center of three fixed-wheel gates. The South Concho and Middle Concho-Spring Creek pools are connected by a 3.22-mile (5.18-kilometer) equalizing channel. At an elevation of 1,925 ft (586.7 m) the two pools join to form one lake. Deliberate impoundment of water began on Dec. 1, 1962; dam was completed Feb. 13, 1963. Capacity curve is based on a survey made in 1958. Reservoir was built for flood control, irrigation, and municipal uses. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	1,991.0	
Crest of spillway.....	1,969.1	640,600
Top of conservation storage.....	1,940.2	186,200
Bottom of equalizing channel.....	1,925.0	84,760
Dead storage in South Concho pool.....	1,925.0	4,600
Lowest gated outlet (invert at Middle Concho-Spring Creek pool).....	1,885.0	3,750

COOPERATION.--Record of elevations furnished by city of San Angelo. Capacity curve furnished by the U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 205,200 acre-ft (253 hm<sup>3</sup>) May 12, 1975, elevation, 1,942.20 ft (591.983 m); minimum since first appreciable storage, 2,120 acre-ft (2.61 hm<sup>3</sup>) Apr. 15, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 202,600 acre-ft (250 hm<sup>3</sup>) May 13, elevation, 1,941.94 ft (591.903 m); minimum, 144,400 acre-ft (178 hm<sup>3</sup>) Sept. 30, elevation, 1,935.10 ft (589.818 m).

Capacity table (elevation, in feet, and total contents, in acre-feet)

1,935.0	143,700	1,940.0	184,400
1,938.0	167,100	1,942.0	203,200

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	170800	176000	182200	184200	185700	185700	183100	188000	187300	177200	163300	151900
2	170800	176300	182200	184300	185700	185500	183000	187800	187200	176800	163100	151600
3	170800	176400	182400	184500	185500	185500	182700	187500	187000	176200	162900	151400
4	171200	176800	182500	184400	185500	185300	182200	187300	186600	175600	162400	151100
5	171100	177000	182700	184300	185700	185200	182100	187200	186200	175300	162000	150800
6	171200	177100	182700	184300	185700	185200	181900	187100	185800	174900	161600	150600
7	171400	177200	182900	184500	185700	185100	181600	187100	185500	174400	161300	150400
8	171500	177600	183000	184400	186000	185200	181500	187100	185100	173900	160900	150200
9	171500	177800	183100	184300	186000	185200	181500	187100	184600	173500	160500	149900
10	171500	178000	183100	184400	186000	185400	181400	187500	184200	172900	160000	149600
11	171500	178000	183100	184400	186200	185100	181300	201100	183800	172300	159400	149400
12	171500	178400	183200	184400	186200	185100	181200	202100	183500	171700	159000	149100
13	171500	178600	183400	184500	186200	185100	181300	201000	183100	171100	158600	148600
14	171500	179000	183600	184600	186200	185100	181800	196000	182800	170500	158300	148400
15	171500	179200	183700	184700	186100	184900	194300	191600	182400	170000	157900	148100
16	171600	179300	183700	184600	186200	184900	198000	191600	182000	169500	157600	147600
17	171500	179600	183700	184700	186200	184900	199600	191800	181500	168900	157100	147300
18	171500	179900	183900	184700	186200	184600	200000	191900	181000	168400	156800	147000
19	171400	180200	184000	184800	186100	184400	200300	192100	180600	167800	156400	146800
20	171400	180500	184000	184800	186100	184300	200300	191800	180100	167300	155900	146500
21	171500	180600	184000	184900	186100	183900	200100	190300	179700	166800	155500	146200
22	171600	180900	184100	185200	186000	183700	198700	187400	179600	166400	155300	145900
23	171600	181200	184100	185200	185700	183500	193800	187300	179600	166200	154700	145600
24	171600	181400	184500	185300	185700	183300	193900	187400	179400	165900	154500	145500
25	171600	181900	184300	185500	185500	183100	189100	187400	179200	165600	154100	145300
26	171700	181900	184400	185500	185600	183200	189100	187400	179200	165300	153600	145200
27	172300	181800	184500	185600	185500	183700	188100	187500	178900	165000	153200	145000
28	173300	182000	184400	185400	185500	183700	188000	187500	178500	164600	153000	144800
29	174900	182100	184500	185400	---	183600	187800	187500	178100	164500	152600	144700
30	175500	182200	184200	185500	---	183400	188000	187500	177600	164200	152400	144400
31	175700	---	184200	185600	---	183200	---	187400	---	163800	152200	---
(+)	1939.02	1939.75	1939.98	1940.13	1940.12	1939.87	1940.40	1940.33	1939.23	1937.60	1936.13	1935.10
(*)	+4900	+6500	+2000	+1400	-100	-2300	+4800	-600	-9800	-13800	-11600	-7800
MAX	175700	182200	184500	185600	186200	185700	200300	202100	187300	177200	163300	151900
MIN	170800	176000	182200	184200	185500	183100	181200	187100	177600	163800	152200	144400
CAL YR 1976	MAX	186800	MIN	163800	*	+1400						
WTR YR 1977	MAX	202100	MIN	144400	*	-26400						

+ Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.



COLORADO RIVER BASIN

85

08131200 TWIN BUTTES RESERVOIR NEAR SAN ANGELO, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICRO- MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG)	DISSOLVED SODIUM (NA) (MG/L)
FEB 25...	0800	688	8.1	10.0	230	60	53	23	54
AUG 08...	1450	636	7.6	--	200	60	42	23	50
DATE	SODIUM ADSORPTION RATIO	DISSOLVED PO-TAS- SIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
FEB 25...	1.6	6.0	204	0	50	83	.4	9.9	380
AUG 08...	1.5	5.3	170	0	45	80	.4	13	343

## COLORADO RIVER BASIN

08131400 PECAN CREEK NEAR SAN ANGELO, TX

LOCATION.--Lat 31°18'32", long 100°26'44", Tom Green County, Hydrologic Unit 12090102, on left bank 200 ft (61 m) upstream from U.S. Highway 277, 3.6 mi (5.8 km) upstream from mouth, and 10.5 mi (16.9 km) south of San Angelo.

DRAINAGE AREA.--83.2 mi<sup>2</sup> (215.5 km<sup>2</sup>).

PERIOD OF RECORD.--June 1961 to current year.

REVISED RECORDS.--WDR TX-75-3: 1971, 1972(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,930.72 ft (588.483 m) above mean sea level. Prior to Apr. 30, 1968, at site 1.2 mi (1.9 km) downstream at datum 20.21 ft (6.160 m) lower.

REMARKS.--Records good. No known diversions above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--16 years, 1.75 ft<sup>3</sup>/s (0.0496 m<sup>3</sup>/s), 0.29 in/yr (7 mm/yr), 1,270 acre-ft/yr (1.57 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,780 ft<sup>3</sup>/s (192 m<sup>3</sup>/s) Sept. 24, 1964, gage height, 11.15 ft (3.399 m), site and datum then in use, from rating curve extended above 2,100 ft<sup>3</sup>/s (59.5 m<sup>3</sup>/s) on basis of slope-area measurement of 30,500 ft<sup>3</sup>/s (864 m<sup>3</sup>/s); no flow most of time each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1908, 14.36 ft (4.377 m), former site and datum, Sept. 15, 1936, discharge 30,500 ft<sup>3</sup>/s (864 m<sup>3</sup>/s), by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 29	1200	204	5.78	1.23	0.375	Apr. 15	0800	*3,110	88.1	3.10	0.945

Minimum discharge, no flow Sept. 26-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.88	3.5	4.6	3.5	2.8	1.4	2.4	14	8.1	2.0	.74	.03
2	.88	2.7	4.6	3.5	3.5	1.6	2.0	11	8.1	2.0	.63	.02
3	1.0	2.7	5.1	3.5	3.5	1.7	2.1	11	8.1	2.0	.63	.01
4	1.2	2.7	4.6	3.5	3.0	2.0	2.0	13	7.5	2.0	.63	.01
5	1.6	2.7	4.6	3.5	2.7	1.8	2.0	13	4.6	2.0	.57	.01
6	1.2	2.7	4.5	3.5	2.6	2.0	2.0	13	4.6	2.0	.49	.02
7	1.3	2.7	4.4	3.5	2.7	2.0	2.0	11	4.6	2.0	.44	.04
8	1.5	2.7	4.6	3.5	2.7	2.0	2.0	9.2	4.6	2.0	.51	.03
9	1.5	2.0	5.5	3.5	2.7	2.0	1.7	9.5	4.0	2.0	.35	.06
10	1.2	2.0	4.6	3.5	2.7	2.0	1.5	9.8	3.5	2.0	.32	.04
11	1.2	2.3	4.6	3.5	2.7	2.1	1.4	23	3.5	2.0	.31	.03
12	1.1	2.0	4.6	3.5	2.7	2.0	1.6	13	3.2	1.7	.31	.02
13	1.2	2.0	4.6	3.5	2.7	2.0	1.7	10	2.7	1.5	.70	.02
14	1.2	2.0	4.6	3.5	2.7	2.0	2.5	9.7	2.7	1.5	.46	.02
15	1.2	1.8	4.6	3.5	2.1	2.0	460	9.7	2.7	1.5	.31	.01
16	1.5	2.0	4.5	3.5	2.0	1.7	174	8.7	2.7	1.5	.26	.01
17	1.5	1.6	3.5	3.5	2.4	2.2	75	8.1	2.7	1.2	.24	.01
18	1.5	1.5	4.1	3.5	2.7	2.7	16	8.1	2.7	1.2	.20	.01
19	1.5	1.5	4.6	3.5	2.7	2.7	14	8.1	3.3	1.2	.20	.09
20	1.5	2.8	5.4	3.5	2.7	2.3	14	8.6	3.3	1.2	.18	.07
21	1.5	4.2	3.5	3.5	2.7	2.0	12	13	3.0	1.3	.19	.06
22	1.6	3.3	3.5	3.6	2.6	2.0	11	10	3.4	1.5	.19	.04
23	1.5	2.7	3.5	4.6	2.5	1.8	11	8.9	3.9	.96	.18	.02
24	1.5	2.8	3.5	3.5	1.8	1.9	11	8.1	3.9	.88	.16	.01
25	1.5	3.9	3.5	3.5	1.5	2.0	11	8.1	3.8	.88	.11	.01
26	1.2	4.6	3.5	3.5	1.5	2.6	11	8.1	4.5	.88	.11	.00
27	1.5	5.8	3.5	2.7	1.6	3.5	11	8.1	2.7	.88	.07	.00
28	2.8	6.2	3.5	3.2	1.5	3.2	11	8.1	2.2	.87	.05	.00
29	66	4.6	3.5	3.5	---	2.5	11	8.1	2.3	1.1	.05	.00
30	14	4.6	3.5	3.5	---	2.7	15	8.1	2.7	1.4	.05	.00
31	4.5	---	3.5	3.0	---	2.3	---	8.1	---	1.4	.05	---
TOTAL	123.26	88.6	130.7	108.1	70.0	66.7	894.9	318.2	119.6	46.55	9.69	.70
MEAN	3.98	2.95	4.22	3.49	2.50	2.15	29.8	10.3	3.99	1.50	.31	.023
MAX	66	6.2	5.5	4.6	3.5	3.5	460	23	8.1	2.0	.74	.09
MIN	.88	1.5	3.5	2.7	1.5	1.4	1.4	8.1	2.2	.87	.05	.00
CFSM	.05	.04	.05	.04	.03	.03	.36	.12	.05	.02	.004	.000
IN.	.06	.04	.06	.05	.03	.03	.40	.14	.05	.02	.00	.00
AC-FT	244	176	259	214	139	132	1780	631	237	92	19	1.4
CAL YR 1976	TOTAL	635.77	MEAN 1.74	MAX 66	MIN .00	CFSM .02	IN .28	AC-FT 1260				
WTR YR 1977	TOTAL	1977.00	MEAN 5.42	MAX 460	MIN .00	CFSM .07	IN .88	AC-FT 3920				

COLORADO RIVER BASIN

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08131600 TOM GREEN COUNTY WATER CONTROL AND IMPROVEMENT DISTRICT NO. 1 CANAL NEAR SAN ANGELO, TX

LOCATION.--Lat 31°24'58", long 100°23'23", Tom Green County, Hydrologic 12090105, on left bank 1,900 ft (579 m) downstream from U.S. Highway 87, 4.3 mi (6.9 km) south of San Angelo, and 7.0 mi (11.3 km) downstream from Lake Nasworthy.

PERIOD OF RECORD.--March 1963 to current year.

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 1,855.33 ft (565.505 m) above mean sea level (Bureau of Reclamation reference mark).

REMARKS.--Records good. Discharge represents water released from Twin Buttes Reservoir (station 08131200) through Lake Nasworthy (station 08132000), principally for irrigation. Local flood runoff is excluded. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--8 years (water years 1964-71), no flow; 6 years (water years 1972-77), 17.4 ft<sup>3</sup>/s (0.493 m<sup>3</sup>/s), 12,610 acre-ft/yr (15.5 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 116 ft<sup>3</sup>/s (3.29 m<sup>3</sup>/s) July 13, 1977; no flow for long periods.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	21	14	3.1	83	.00	45	69	3.2	8.1
2	.00	.00	.00	21	13	.04	79	.00	40	61	18	7.1
3	.00	.00	.00	21	14	5.9	79	.00	62	56	26	5.4
4	8.7	.00	.00	21	13	5.9	73	.00	74	53	26	5.3
5	5.8	.00	.00	21	13	5.4	57	.00	83	68	26	5.2
6	5.5	.00	.00	21	13	5.6	53	.00	84	83	23	5.3
7	5.7	.00	.00	21	13	5.7	46	.00	84	92	20	5.2
8	.78	.00	.00	20	14	11	28	.00	84	97	20	5.3
9	.00	.00	1.0	20	13	24	23	.00	84	98	21	5.2
10	.00	.00	12	20	13	25	23	.00	83	98	26	5.4
11	.00	.00	12	20	15	25	23	.00	83	107	26	5.2
12	.00	.00	12	18	14	24	23	.00	82	112	26	5.2
13	.00	.00	16	14	14	24	23	.00	81	116	27	4.9
14	.00	.00	21	14	13	25	22	.00	78	115	28	5.0
15	.00	.00	21	14	14	36	11	.00	76	115	34	5.1
16	.00	.00	21	14	14	45	4.5	.00	75	114	34	5.4
17	.00	.00	21	14	14	46	4.8	.00	75	113	35	5.4
18	.05	.00	21	14	14	60	.60	.00	76	113	46	5.3
19	5.1	.00	21	14	14	66	.26	.00	74	112	47	5.3
20	5.8	.00	21	14	14	72	.22	.00	71	111	51	5.2
21	5.3	.00	20	14	14	72	.07	.00	63	110	52	5.3
22	5.4	.00	20	14	14	77	.02	.00	64	77	49	5.3
23	5.3	.00	22	14	11	81	.01	2.1	80	34	42	5.3
24	5.3	.00	20	14	9.5	90	.00	12	82	26	36	5.2
25	5.3	.00	20	14	12	93	.00	3.6	82	26	21	4.9
26	5.3	.00	21	14	11	93	.00	3.5	74	26	14	5.1
27	5.7	.00	21	14	11	9.0	.00	3.5	74	26	14	5.3
28	2.4	.00	22	14	10	11	.00	3.3	75	26	15	5.3
29	1.1	.00	20	14	---	71	.00	4.6	75	20	13	5.2
30	.04	.00	20	14	---	83	.00	23	74	11	8.1	4.7
31	.00	---	21	14	---	83	---	36	---	3.0	8.1	---
TOTAL	78.57	.00	427.00	511	365.5	1277.64	656.48	91.60	2237	2288.0	835.4	161.1
MEAN	2.53	.000	13.8	16.5	13.1	41.2	21.9	2.95	74.6	73.8	26.9	5.37
MAX	8.7	.00	22	21	15	93	83	36	84	116	52	8.1
MIN	.00	.00	.00	14	9.5	.04	.00	.00	40	3.0	3.2	4.7
AC-FT	156	.00	847	1010	725	2530	1300	182	4440	4540	1660	320
CAL YR 1976	TOTAL	6994.64	MEAN	19.1	MAX	91	MIN	.00	AC-FT	13870		
WTR YR 1977	TOTAL	8929.29	MEAN	24.5	MAX	116	MIN	.00	AC-FT	17710		

## 08132000 LAKE NASWORTHY NEAR SAN ANGELO, TX

LOCATION.--Lat 31°23'19", long 100°28'41", Tom Green County, Hydrologic Unit 12090102, on left bank 250 ft (76 m) upstream from Nasworthy Dam on South Concho River, 3.8 mi (6.1 km) downstream from Twin Buttes Dam, 6.0 mi (9.7 km) southwest of San Angelo, and 68.9 mi (110.9 km) upstream from mouth.

DRAINAGE AREA.--3,833 mi<sup>2</sup> (9,927 km<sup>2</sup>), of which 3,724 mi<sup>2</sup> (9,645 km<sup>2</sup>) is above Twin Buttes Reservoir and 1,178 mi<sup>2</sup> (3,051 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1930 to current year. Prior to October 1969, monthend contents only.

GAGE.--Water-stage recorder. Datum of gage is 1,840.00 ft (560.832 m) above mean sea level.

REMARKS.--The lake is formed by a 6,090-foot (1,860-meter) dam with a 5,590-foot (1,700-meter) earthen section, an earthen spillway 300 ft (91 m) long, a concrete spillway 375 ft (114 m) long with a bank of fifteen 18.0- by 25.0-foot (5.5- by 7.6-meter) tainter gates, and a collapsible floodgate. The dam was completed and storage began Mar. 28, 1930. Since July 1966, West Texas Utilities Co. has operated a steam generating powerplant on Lake Nasworthy. Since September 1962, the lake has been almost totally controlled by releases or pumpage from Twin Buttes Reservoir (station 08131200). Silting surveys in December 1938 and May 1953 by the Soil Conservation Service show that 1,191 acre-ft (1.47 hm<sup>3</sup>) of silt was deposited from March 1930 to December 1938 and an additional 1,023 acre-ft (1.26 hm<sup>3</sup>) was deposited from December 1938 to May 1953, totaling 2,214 acre-ft (2.73 hm<sup>3</sup>). Water is used for part of San Angelo municipal supply and for irrigation east of San Angelo (see station 08131600 for diversions). The capacity curve is based on a survey by the Soil Conservation Service in 1953 and has been used since 1955. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam.....	43.5	-
Crest of spillway (300 ft).....	39.1	27,810
Top of gates.....	33.2	13,990
Top of collapsible floodgate.....	32.2	12,390
Lowest outlet to canal (invert).....	27.5	6,370
Crest of spillway (tainter gates sill).....	15.3	435
Lowest gated outlet (invert).....	-4.0	0

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 26,900 acre-ft (33.2 hm<sup>3</sup>) Sept. 15, 1936, gage height, 38.36 ft (11.692 m); minimum, 209 acre-ft (0.258 hm<sup>3</sup>) Aug. 22, 1964, gage height, 13.21 ft (4.026 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 11,930 acre-ft (14.7 hm<sup>3</sup>) Apr. 17, gage height, 31.91 ft (9.726 m); minimum, 10,120 acre-ft (12.5 hm<sup>3</sup>) Aug. 8, gage height, 30.75 ft (9.373 m).

Capacity table (gage height, in feet, and total contents, in acre-feet)

30.0	9,170
32.0	12,070

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10390	11160	10320	10330	10710	10770	10470	10400	10300	10330	10410	10500
2	10390	11130	10320	10370	10690	10770	10490	10400	10270	10340	10390	10470
3	10370	11080	10320	10400	10690	10760	10490	10370	10250	10360	10340	10470
4	10440	11050	10320	10410	10710	10730	10490	10360	10270	10390	10290	10460
5	10430	11060	10330	10430	10730	10690	10530	10390	10320	10400	10220	10440
6	10430	11010	10330	10440	10730	10710	10530	10320	10360	10370	10180	10440
7	10500	10980	10330	10490	10760	10660	10600	10320	10390	10330	10130	10440
8	10500	11060	10330	10490	10810	10600	10650	10320	10430	10320	10120	10440
9	10500	11000	10330	10520	10820	10530	10600	10320	10390	10370	10150	10430
10	10500	10970	10320	10520	10850	10500	10550	10400	10360	10390	10220	10430
11	10500	10920	10330	10530	10870	10430	10520	10470	10360	10370	10340	10400
12	10490	10900	10330	10570	10890	10440	10490	10460	10360	10340	10410	10390
13	10490	10950	10360	10600	10900	10460	10470	10740	10360	10330	10470	10340
14	10490	10950	10360	10580	10890	10470	10570	10470	10360	10330	10500	10340
15	10500	10950	10370	10550	10920	10460	11620	10610	10390	10340	10550	10320
16	10470	10930	10370	10570	10900	10490	11910	10580	10390	10360	10570	10300
17	10470	10930	10390	10570	10900	10530	11370	10530	10390	10360	10580	10300
18	10460	10930	10390	10550	10900	10530	10760	10500	10390	10360	10580	10320
19	10440	10930	10370	10550	10890	10490	10400	10500	10370	10360	10580	10340
20	10430	10930	10370	10550	10890	10460	10390	10430	10360	10390	10570	10400
21	10400	10900	10370	10550	10890	10430	10320	10390	10340	10460	10550	10500
22	10410	10950	10360	10600	10900	10460	10320	10470	10360	10500	10580	10570
23	10400	10890	10360	10600	10850	10460	10430	10440	10340	10470	10580	10630
24	10400	10820	10360	10600	10840	10490	10600	10410	10360	10370	10580	10690
25	10400	10770	10360	10600	10820	10550	10390	10390	10330	10320	10600	10710
26	10390	10600	10340	10580	10810	10710	10370	10370	10320	10300	10580	10660
27	10570	10460	10340	10580	10770	10710	10330	10390	10320	10270	10580	10580
28	10760	10360	10330	10550	10770	10580	10330	10410	10320	10260	10660	10500
29	11140	10320	10340	10570	---	10490	10360	10390	10320	10330	10690	10460
30	11210	10320	10300	10610	---	10460	10410	10360	10300	10370	10660	10440
31	11190	---	10330	10650	---	10460	---	10330	---	10410	10580	---
(†)	31.45	30.89	30.90	31.11	31.19	30.99	30.96	30.90	30.88	30.96	31.07	30.98
(*)	+800	-870	+10	+320	+120	-310	-50	-80	-30	+110	+170	-140
MAX	11210	11160	10390	10650	10920	10770	11910	10740	10430	10500	10690	10710
MIN	10370	10320	10300	10330	10690	10430	10320	10320	10250	10260	10120	10300

CAL YR 1976 MAX 11210 MIN 10260 \* -190  
WTR YR 1977 MAX 11910 MIN 10120 \* +50

† Gage height, in feet, at end of month.  
\* Change in contents, in acre-feet.

COLORADO RIVER BASIN

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08132000 LAKE NASWORTHY NEAR SAN ANGELO, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD---Chemical analyses: October 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
FEB 25...	1005	1100	8.2	13.0	290	100	70	28	110
AUG 08...	1550	766	7.3	29.0	220	65	49	24	69
DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
FEB 25...	2.8	6.5	232	0	81	190	.4	13	613
AUG 08...	2.0	5.2	190	0	56	110	.5	16	423



## COLORADO RIVER BASIN

08133500 NORTH CONCHO RIVER AT STERLING CITY, TX

LOCATION.--Lat 31°49'48", long 100°59'36", Sterling County, Hydrologic Unit 12090104, on right bank 100 ft (30 m) upstream from bridge on State Highway 163, 0.5 mi (0.8 km) south of Sterling City, 4.0 mi (6.4 km) upstream from Sterling Creek, 5.1 mi (8.2 km) downstream from Lacy Creek, and 55.3 mi (89.0 km) upstream from mouth.

DRAINAGE AREA.--605 mi<sup>2</sup> (1,567 km<sup>2</sup>), of which 66 mi<sup>2</sup> (171 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--September 1939 to current year.

REVISED RECORDS.--WSP 1512: 1945, 1948. WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,242.36 ft (683.471 m) above mean sea level. Prior to Dec. 6, 1939, nonrecording gage at same site and datum.

REMARKS.--Records good. Small diversions above station for irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--38 years, 8.88 ft<sup>3</sup>/s (0.251 m<sup>3</sup>/s), 6,430 acre-ft/yr (7.93 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,300 ft<sup>3</sup>/s (462 m<sup>3</sup>/s) July 6, 1948, gage height, 23.70 ft (7.224 m); no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1891, that of July 6, 1948.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,120 ft<sup>3</sup>/s (60.0 m<sup>3</sup>/s) June 26, gage height, 15.06 ft (4.590 m), no other peak above base of 300 ft<sup>3</sup>/s (8.50 m<sup>3</sup>/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	1.8	.73	1.2	1.1	.91	.76	.63	.10	2.4	.04	.00
2	1.1	1.7	1.2	1.0	1.2	1.3	.79	.61	.09	1.7	.02	.00
3	1.1	1.6	1.3	1.1	1.2	1.2	.84	.56	.07	1.4	.00	.00
4	1.4	1.6	1.3	1.2	1.3	1.3	.68	.53	.07	1.1	.00	.00
5	2.4	1.6	1.6	1.4	.86	1.2	.84	.55	.05	.89	.00	.00
6	1.6	1.6	1.7	1.3	.90	1.1	.78	.64	.04	.70	.00	.00
7	1.8	1.8	2.1	1.2	1.2	1.2	.86	.53	.03	.69	.00	.00
8	1.9	1.7	.73	1.2	1.4	1.2	.82	.52	.03	.64	.00	.00
9	1.5	1.5	1.4	1.8	1.2	1.1	.74	.52	.03	.71	.00	.00
10	1.1	1.7	1.9	1.8	.98	1.1	.79	.52	.02	1.0	.00	.00
11	.99	1.6	1.8	1.2	1.8	1.2	.74	.78	.01	.76	.00	.00
12	.95	1.8	1.1	1.3	1.8	1.3	.71	.61	.00	.50	.00	.00
13	.89	1.8	1.1	1.6	1.5	.88	.92	.51	.00	.37	.00	.00
14	.88	2.2	1.2	1.6	1.2	.60	2.0	.48	.00	.29	.00	.00
15	.93	1.9	1.9	1.4	1.3	.53	2.6	.44	.01	.27	.00	.00
16	.96	1.8	1.5	1.2	1.1	1.0	1.9	.42	.00	.26	.00	.00
17	.89	1.6	1.5	1.3	1.1	.99	2.1	.36	.00	.25	.00	.00
18	.81	1.5	1.4	1.1	1.2	.86	1.9	.35	.00	.23	.00	.00
19	.67	1.3	1.5	1.3	1.6	.77	1.2	.34	.00	.22	.00	.00
20	.72	1.2	1.4	1.3	1.5	.66	1.2	.36	.00	.19	.00	.00
21	.72	1.4	1.3	1.8	1.5	.64	1.0	.34	.00	.18	.00	.00
22	.87	1.5	1.0	1.7	1.1	.54	.92	.29	.00	.54	.00	.00
23	1.2	1.7	1.0	1.7	1.8	.61	.84	.26	.00	.44	.00	.00
24	1.1	1.1	1.4	1.6	2.0	.95	.74	.23	.00	.19	.00	.00
25	.98	1.4	1.7	1.1	.67	1.1	.69	.23	.02	.14	.00	.00
26	.98	1.6	1.5	1.4	.52	3.2	.71	.22	657	.12	.00	.00
27	1.5	.94	1.2	1.8	.87	6.8	.64	.22	55	.09	.00	.00
28	3.2	.66	1.4	1.2	.75	2.6	.62	.23	20	.08	.00	.00
29	6.9	.44	1.5	1.0	---	1.1	.63	.20	7.7	.09	.00	.00
30	3.7	.49	1.5	1.0	---	.82	.62	.13	3.8	.09	.00	.00
31	2.3	---	1.3	1.1	---	.75	---	.10	---	.08	.00	---
TOTAL	47.24	44.53	43.16	41.9	34.65	39.51	30.58	12.71	744.07	16.61	.06	.00
MEAN	1.52	1.48	1.39	1.35	1.24	1.27	1.02	.41	24.8	.54	.002	.000
MAX	6.9	2.2	2.1	1.8	2.0	6.8	2.6	.78	657	2.4	.04	.00
MIN	.67	.44	.73	1.0	.52	.53	.62	.10	.00	.08	.00	.00
AC-FT	94	88	86	83	69	78	61	25	1480	33	.1	.00
CAL YR 1976	TOTAL	1117.23	MEAN	3.05	MAX	648	MIN	.00	AC-FT	2220		
WTR YR 1977	TOTAL	1055.02	MEAN	2.89	MAX	657	MIN	.00	AC-FT	2090		

COLORADO RIVER BASIN

91

08134000 NORTH CONCHO RIVER NEAR CARLSBAD, TX

LOCATION:--Lat 31°35'33", long 100°38'12", Tom Green County, Hydrologic Unit 12090104, near left bank on downstream side of bridge on county road, 0.6 mi (1.0 km) southeast of Carlsbad, 1.5 mi (2.4 km) upstream from Mule Creek, 2.5 mi (4.0 km) upstream from Grape Creek, 16.2 mi (26.1 km) upstream from O. C. Fisher Dam, and 22.9 mi (36.8 km) upstream from mouth.

DRAINAGE AREA.--1,249 mi<sup>2</sup> (3,235 km<sup>2</sup>), of which 105 mi<sup>2</sup> (272 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--March 1924 to current year.

REVISED RECORDS.--WSP 1512: 1924(M), 1925, 1926(M), 1928, 1930, 1932(M), 1935, 1937-38(M), 1941(M), 1945(M), 1947-49(M). WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,968.02 ft (599.852 m) above mean sea level. Prior to Feb. 4, 1925, and Sept. 27, 1936, to Feb. 7, 1937, nonrecording gage; Feb. 4, 1925, to Sept. 26, 1936, and Feb. 8, 1937, to Nov. 6, 1955, water-stage recorder, all at site 2.5 mi (4.0 km) upstream at datum 32.76 ft (9.985 m) higher.

REMARKS.--Records good. Diversions by pumping above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--53 years, 36.5 ft<sup>3</sup>/s (1.034 m<sup>3</sup>/s), 26,440 acre-ft/yr (32.6 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 94,600 ft<sup>3</sup>/s (2,680 m<sup>3</sup>/s) Sept. 26, 1936, gage height, 16.0 ft (4.88 m) at former site, 29.1 ft (8.87 m) at present site, from floodmarks, by slope-area measurement of peak flow at former site; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1853, that of Sept. 26, 1936. Stage not known for major flood in June 1853.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,200 ft<sup>3</sup>/s (62.3 m<sup>3</sup>/s) June 26, gage height, 9.38 ft (2.859 m), no other peak above base of 1,500 ft<sup>3</sup>/s (42.5 m<sup>3</sup>/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	1.7	2.4	2.1	3.5	3.8	4.5	5.6	1.3	11	.03	.00
2	2.1	2.1	2.4	2.4	3.5	4.1	4.1	5.6	1.2	8.0	.02	.00
3	1.7	1.9	2.1	1.7	3.8	4.1	3.8	5.2	1.0	5.6	.01	.00
4	1.7	1.7	2.4	3.5	3.8	3.8	3.5	4.8	1.0	4.5	.00	.00
5	1.7	1.5	2.4	3.8	3.8	3.8	3.2	4.8	.54	3.5	.00	.00
6	1.7	1.3	2.1	3.5	3.8	3.8	3.2	5.6	.45	2.9	.00	.00
7	2.1	1.5	1.9	3.2	3.8	4.1	3.2	4.5	.37	2.4	.00	.00
8	2.9	1.7	1.7	3.2	4.5	4.1	3.5	4.5	.24	2.1	.00	.00
9	2.6	1.7	1.7	3.2	4.5	4.1	3.5	4.5	.14	1.9	.00	.00
10	2.4	2.6	1.9	2.9	4.5	4.1	3.5	4.5	.04	1.9	.00	.00
11	1.9	3.2	2.1	2.9	4.8	4.1	3.5	7.4	.03	1.3	.00	.00
12	1.3	3.5	2.1	3.2	4.5	3.8	3.8	3.8	.04	1.0	.00	.00
13	1.0	3.2	2.6	3.5	4.5	3.5	3.8	3.5	.06	.75	.00	.00
14	.87	3.5	3.2	3.5	4.5	3.8	6.4	3.2	.06	.45	.00	.00
15	1.5	3.5	3.2	3.5	4.5	3.8	7.2	4.1	.06	.30	.00	.00
16	2.6	3.2	3.2	3.2	4.5	3.8	8.0	5.2	.04	.24	.00	.00
17	1.5	2.9	2.9	3.2	4.5	3.8	9.8	4.1	.03	.18	.00	.00
18	.87	2.9	2.9	3.5	4.1	4.1	7.6	3.2	.01	.10	.00	.00
19	.64	2.9	3.5	3.5	3.8	3.8	7.6	3.2	.00	.10	.00	.00
20	.64	3.2	3.2	3.5	3.8	3.5	7.2	3.2	.00	.10	.00	.00
21	.55	2.9	2.6	3.5	3.8	3.5	6.4	3.2	.00	.18	.00	.00
22	.45	2.6	2.6	3.8	3.5	3.5	6.0	2.6	.00	2.7	.00	.00
23	.54	2.4	2.9	4.1	3.5	3.5	5.6	2.6	.02	1.5	.00	.00
24	1.0	2.6	2.6	3.8	3.5	3.8	5.6	2.1	.05	.64	.00	.00
25	1.3	2.9	2.6	3.8	3.2	3.8	5.6	1.7	.21	.24	.00	.00
26	1.7	3.2	2.1	3.8	3.5	7.4	5.2	1.7	509	.18	.00	.00
27	4.5	4.1	2.4	3.8	3.2	9.8	5.2	1.9	388	.10	.00	.00
28	5.6	2.9	2.4	3.8	3.2	6.0	4.8	1.9	82	.10	.00	.00
29	7.6	2.4	2.1	3.8	---	6.8	5.2	1.9	37	.10	.00	.00
30	3.8	2.4	2.4	3.5	---	5.6	6.8	2.1	18	.09	.00	.00
31	2.4	---	2.4	3.5	---	4.8	---	1.5	---	.06	.00	---
TOTAL	63.56	78.1	77.0	104.2	110.4	136.3	157.3	113.7	1040.89	54.21	.06	.00
MEAN	2.05	2.60	2.48	3.36	3.94	4.40	5.24	3.67	34.7	1.75	.002	.000
MAX	7.6	4.1	3.5	4.1	4.8	9.8	9.8	7.4	509	11	.03	.00
MIN	.45	1.3	1.7	1.7	3.2	3.5	3.2	1.5	.00	.06	.00	.00
AC-FT	126	155	153	207	219	270	312	226	2060	108	.1	.00
CAL YR 1976	TOTAL	1116.59	MEAN	3.05	MAX	301	MIN	.00	AC-FT	2210		
WTR YR 1977	TOTAL	1935.72	MEAN	5.30	MAX	509	MIN	.00	AC-FT	3840		

## COLORADO RIVER BASIN

08134500 O. C. FISHER LAKE AT SAN ANGELO, TX

LOCATION.--Lat 31°29'04", long 100°28'53", Tom Green County, Hydrologic Unit 12090104, in intake structure of San Angelo Dam on North Concho River, 3.1 mi (5.0 km) northwest of San Angelo, and 6.6 mi (10.6 km) upstream from mouth.

DRAINAGE AREA.--1,488 mi<sup>2</sup> (3,854 km<sup>2</sup>), of which 105 mi<sup>2</sup> (272 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1952 to current year. Published as San Angelo Reservoir prior to October 1970, and as San Angelo Lake, October 1970 to September 1974.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Prior to May 12, 1953, nonrecording gage at same site and datum.

REMARKS.--The lake is formed by a rolled earthfill dam 40,885 ft (12,462 m) long, including spillway. Closure was completed Mar. 7, 1951, and the dam was completed May 3, 1951. Deliberate impoundment began Feb. 1, 1952. The lake is operated for flood control and recreation with part as municipal supply for the city of San Angelo. The spillway is an uncontrolled off-channel concrete gravity dam with ogee weir section 1,150 ft (351 m) wide located to the right and upstream from the right end of dam. The spillway is designed to discharge 356,000 ft<sup>3</sup>/s (10,100 m<sup>3</sup>/s) at maximum design flood level. The service control outlet works consist of six gate-controlled outlets, 7.5 by 14.5 ft (2.3 by 4.4 m), opening into two 18.0-foot-diameter (5.5 m) concrete conduits and two 2.5-foot (0.8 m) gate-controlled outlets for water-supply outlets. Since February 1973, the capacity is based on a survey made in 1962. Prior to 1973, the capacity was based on a survey made in 1944. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	1,964.0	-
Design flood.....	1,958.0	690,000
Crest of spillway.....	1,938.5	392,700
Top of conservation pool.....	1,908.0	115,700
Lowest gated outlet (invert).....	1,840.0	0

COOPERATION.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 174,100 acre-ft (215 hm<sup>3</sup>) Oct. 14, 1957, elevation, 1,916.47 ft (584.140 m); minimum since first appreciable storage, lake dry July 16, 1970, to Apr. 15, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 29,390 acre-ft (36.2 hm<sup>3</sup>) Oct. 1, elevation, 1,882.92 ft (573.914 m); minimum, 24,050 acre-ft (29.7 hm<sup>3</sup>) Sept. 30, elevation, 1,880.26 ft (573.103 m).

Capacity table (elevation, in feet, and total contents, in acre-feet)

1,880.0	23,570	1,882.0	27,480
1,881.0	25,480	1,883.0	29,560

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29360	29300	29010	28710	28630	28460	27970	28400	28170	28460	26910	25420
2	29340	29300	28960	28710	28690	28440	27950	28400	28150	28420	26850	25360
3	29300	29280	28960	28710	28690	28400	27970	28360	28090	28360	26810	25340
4	29360	29280	28960	28690	28670	28380	27840	28340	28050	28280	26730	25280
5	29300	29280	28940	28690	28670	28360	27820	28360	27970	28260	26670	25240
6	29240	29260	28960	28670	28650	28320	27800	28340	27930	28220	26600	25200
7	29300	29240	28920	28670	28670	28300	27780	28320	27890	28170	26580	25160
8	29260	29220	28920	28670	28690	28280	27760	28320	27820	28110	26440	25120
9	29240	29220	28900	28670	28670	28280	27740	28420	27740	28070	26380	25080
10	29200	29220	28900	28650	28710	28300	27680	28590	27680	28010	26340	25040
11	29150	29200	28880	28630	28710	28260	27660	28570	27640	27950	26280	24970
12	29130	29200	28860	28650	28710	28220	27660	28550	27580	27820	26220	24970
13	29110	29240	28880	28690	28740	28220	27660	28510	27540	27740	26180	24890
14	29090	29200	28880	28690	28710	28200	27870	28510	27480	27700	26150	24850
15	29070	29200	28880	28670	28710	28170	28110	28550	27440	27640	26090	24790
16	29010	29170	28880	28670	28690	28130	28360	28510	27370	27600	26030	24750
17	28960	29150	28880	28650	28690	28130	28380	28510	27310	27540	25970	24700
18	28940	29150	28880	28650	28690	28130	28400	28460	27230	27480	25910	24660
19	28920	29150	28880	28630	28670	28090	28420	28490	27190	27390	25870	24600
20	28880	29150	28860	28630	28650	28050	28510	28510	27110	27330	25810	24560
21	28840	29150	28860	28630	28670	28010	28490	28460	27070	27420	25770	24510
22	28820	29130	28860	28630	28650	27970	28460	28420	27130	27370	25730	24450
23	28800	29130	28840	28690	28610	27930	28440	28380	27130	27330	25670	24390
24	28800	29130	28840	28670	28590	27930	28440	28340	27110	27270	25610	24350
25	28740	29170	28820	28670	28590	27930	28440	28300	27130	27230	25570	24300
26	28740	29150	28800	28670	28550	28090	28400	28280	27330	27170	25490	24260
27	28900	29110	28800	28690	28490	28090	28380	28260	28380	27110	25400	24240
28	29090	29090	28780	28650	28460	28030	28360	28260	28460	27070	25610	24180
29	29340	29050	28780	28650	---	28030	28340	28260	28530	27110	25570	24120
30	29320	29030	28740	28670	---	27990	28420	28260	28510	27030	25530	24050
31	29320	---	28710	28670	---	27970	---	28200	---	26970	25470	---
(+)	1882.89	1882.75	1882.60	1882.58	1882.48	1882.24	1882.46	1882.35	1882.50	1881.75	1881.00	1880.26
(*)	-70	-290	-320	-40	-210	-490	+450	-220	+310	-1540	-1500	-1420
MAX	29360	29300	29010	28710	28740	28460	28510	28590	28530	28460	26910	25420
MIN	28740	29030	28710	28630	28460	27930	27660	28200	27070	26970	25400	24050
CAL YR 1976.....	* -6290											
WTR YR 1977.....	* -5340											
	MAX 34970				MIN 28710							
	MAX 29360				MIN 24050							

+ Elevation, in feet, at end of month.  
\* Change in contents, in acre-feet.

COLORADO RIVER BASIN

93

08134500 O. C. FISHER LAKE AT SAN ANGELO, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 19...	1220	497	7.6	17.0	170	42	43	16	26
DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 19...	.9	15	160	0	30	53	.2	6.5	269

## COLORADO RIVER BASIN

08135000 NORTH CONCHO RIVER AT SAN ANGELO, TX

LOCATION.--Lat 31°27'57", long 100°26'51", Tom Green County, Hydrologic Unit 12090104, near left bank on downstream side of pier of Sixth Street Bridge in San Angelo, 3.2 mi (5.1 km) upstream from confluence with South Concho River, and 3.4 mi (5.5 km) downstream from O. C. Fisher Dam.

DRAINAGE AREA.--1,507 mi<sup>2</sup> (3,903 km<sup>2</sup>), of which 105 mi<sup>2</sup> (272 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--October 1915 to June 1928, February 1929 to September 1931, July 1947 to current year.

REVISED RECORDS.--WSP 568: 1916, 1918-22. WSP 1512: 1916(M), 1917-18, 1919-21(M). WSP 1922: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,813.42 ft (552.730 m) above mean sea level. Prior to Sept. 1, 1920, nonrecording gage, and Sept. 1, 1920, to Feb. 11, 1929, water-stage recorder at site 1.6 mi (2.6 km) downstream at datum 11.02 ft (3.359 m) lower. Feb. 12, 1929, to Sept. 30, 1931, water-stage recorder at site 1.6 mi (2.6 km) downstream at datum 13.02 ft (3.968 m) lower.

REMARKS.--Records good. Since October 1951, flow regulated by O. C. Fisher Lake (station 08134500). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years (water years 1916-27, 1930-31, 1948-51) prior to completion of O. C. Fisher Dam, 54.5 ft<sup>3</sup>/s (1.543 m<sup>3</sup>/s), 39,490 acre-ft/yr (48.7 hm<sup>3</sup>/yr); 26 years (water years 1952-77) regulated, 9.25 ft<sup>3</sup>/s (0.262 m<sup>3</sup>/s), 6,700 acre-ft/yr (8.26 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 47,000 ft<sup>3</sup>/s (1,330 m<sup>3</sup>/s) June 13, 1930, gage height, 22.52 ft (6.864 m), site and datum then in use; no flow at time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 17, 1936, reached a stage of 34.6 ft (10.55 m), from floodmarks, discharge, 184,000 ft<sup>3</sup>/s (5,210 m<sup>3</sup>/s), by slope-area measurement. The flood in 1936 was the greatest since flood in June 1853 (stage unknown).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 147 ft<sup>3</sup>/s (4.16 m<sup>3</sup>/s) July 21, gage height, 2.25 ft (0.686 m); maximum gage height, 2.27 ft (0.692 m) Apr. 17; minimum daily discharge, 0.10 ft<sup>3</sup>/s (0.003 m<sup>3</sup>/s) Sept. 28-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	1.5	1.3	.81	1.2	.71	1.2	1.3	1.3	.75	.55	.30
2	.80	1.4	1.5	1.1	1.2	.76	1.3	1.2	1.2	.75	.50	.25
3	.69	1.5	1.4	1.2	1.1	.78	1.3	1.2	1.2	.75	.50	.25
4	2.4	1.5	1.1	1.0	.95	.69	1.1	1.2	1.1	.70	.45	.25
5	3.0	1.5	1.2	.76	.89	.68	1.0	1.5	1.1	.70	.45	.25
6	1.2	1.5	1.2	.84	.98	.70	.87	1.3	1.1	.70	.45	.25
7	5.5	1.4	1.1	.95	1.2	.65	.81	1.2	1.1	.65	.45	.25
8	3.1	1.4	1.2	.87	1.9	.59	.87	1.2	1.0	.60	.40	.25
9	1.4	1.3	1.1	1.0	1.0	.60	.94	7.3	.90	.60	.36	.25
10	1.1	1.3	1.1	.93	.93	.86	.98	3.6	.80	.60	.32	.25
11	1.1	1.2	1.1	.91	1.2	1.9	.97	23	.70	.55	.29	.25
12	.93	1.4	1.1	.95	.99	.89	.93	3.0	.70	.55	.27	.25
13	.80	2.7	1.3	1.2	.97	.82	1.0	2.0	.65	.52	.40	.25
14	.80	4.8	1.4	1.1	.97	.87	9.4	1.5	.65	.50	.36	.25
15	1.1	2.9	1.2	1.0	.96	.82	29	9.3	.65	.50	.36	.25
16	.93	1.4	1.2	1.0	.96	.69	39	3.0	.63	.50	.32	.25
17	.93	1.3	1.1	.95	1.1	.76	9.3	1.9	.63	.45	.23	.25
18	1.4	1.3	1.1	.91	1.1	.89	5.9	1.6	.66	.45	.23	.25
19	1.6	1.4	1.2	.91	1.1	.81	5.3	1.4	.66	.45	.18	.25
20	.94	1.4	1.2	.93	1.5	.75	3.0	1.3	.66	.45	.14	.25
21	.84	1.3	1.0	1.0	1.2	.78	2.7	1.2	.66	9.8	.18	.25
22	.81	1.2	1.1	1.9	1.1	.69	1.8	1.2	3.0	26	.23	.23
23	.85	1.2	1.1	1.6	.92	.69	1.5	1.2	1.8	1.6	.18	.20
24	1.0	1.3	1.3	1.4	1.0	.69	1.4	1.2	1.7	.86	.15	.20
25	.90	1.4	1.5	1.2	.82	.74	1.3	1.3	1.6	.60	.15	.20
26	.84	1.4	2.1	1.1	.80	11	1.3	1.2	3.4	.50	.15	.15
27	11	1.2	1.0	1.1	.75	9.0	1.2	1.2	1.4	.36	.15	.15
28	22	1.2	.97	.92	.70	2.1	1.2	1.2	1.0	.40	12	.10
29	45	1.2	1.0	.93	---	1.6	1.2	1.6	.90	4.2	2.7	.10
30	3.6	1.3	.97	1.7	---	1.4	1.5	6.3	.80	1.2	.70	.10
31	1.8	---	.81	1.4	---	1.2	---	1.6	---	.60	.40	---
TOTAL	119.16	46.8	36.95	33.57	29.49	46.11	129.27	88.2	33.65	57.84	24.20	6.73
MEAN	3.84	1.56	1.19	1.08	1.05	1.49	4.31	2.85	1.12	1.87	.78	.22
MAX	45	4.8	2.1	1.9	1.9	11	39	23	3.4	26	12	.30
MIN	.69	1.2	.81	.76	.70	.59	.81	1.2	.63	.36	.14	.10
AC-FT	236	93	73	67	58	91	256	175	67	115	48	13
CAL YR 1976	TOTAL	701.88	MEAN	1.92	MAX	45	MIN	.07	AC-FT	1390		
WTR YR 1977	TOTAL	651.97	MEAN	1.79	MAX	45	MIN	.10	AC-FT	1290		



## 08136000 CONCHO RIVER AT SAN ANGELO, TX

LOCATION.--Lat 31°27'16", Long 100°24'37", Tom Green County, Hydrologic Unit 12090105, on left bank 0.4 mi (0.6 km) downstream from confluence of North and South Concho Rivers, 1.8 mi (2.9 km) southeast of Tom Green County Courthouse, and 60.9 mi (98.0 km) upstream from mouth.

DRAINAGE AREA.--5,380 mi<sup>2</sup> (13,934 km<sup>2</sup>), of which 1,283 mi<sup>2</sup> (3,323 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--September 1915 to current year. Prior to October 1969, published as "near San Angelo".

REVISED RECORDS.--WSP 568: 1915-16, 1919-22. WSP 1148: 1916-22(M), 1924(M), 1925-26, 1929(M), 1930-32, 1935-37. WSP 1512: 1917-18. WSP 1712: 1936. WSP 1922: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,776.79 ft (541.566 m) above mean sea level. Prior to Aug. 11, 1917, nonrecording gage at same site and datum. Aug. 11, 1917, to May 15, 1963, water-stage recorder on right bank at same datum.

REMARKS.--Records good. Many diversions upstream from station for irrigation, industrial, and municipal supply. Records furnished by the city of San Angelo show that they diverted 15,160 acre-ft (18.7 hm<sup>3</sup>), of which 43 acre-ft (53,000 m<sup>3</sup>) was diverted from E. V. Spence Reservoir during the year. All of the sewage effluent is used for irrigation about 6 mi (10 km) downstream from gage, and none is returned directly to the river. Flow is regulated by Twin Buttes Reservoir (station 08131200) on the South Concho River and by O. C. Fisher Lake (station 08134500) on the North Concho River. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--47 years (water years 1916-62) prior to construction of Twin Buttes Dam, 158 ft<sup>3</sup>/s (4.475 m<sup>3</sup>/s), 114,500 acre-ft/yr (141 hm<sup>3</sup>/yr); 15 years (water years 1963-77) regulated, 23.7 ft<sup>3</sup>/s (0.671 m<sup>3</sup>/s), 17,170 acre-ft/yr (21.2 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 230,000 ft<sup>3</sup>/s (6,510 m<sup>3</sup>/s) Sept. 17, 1936, gage height, 46.6 ft (14.20 m), from floodmarks, from rating curve extended above 105,000 ft<sup>3</sup>/s (2,970 m<sup>3</sup>/s) on basis of slope-area measurements of 167,000 and 230,000 ft<sup>3</sup>/s (4,730 and 6,510 m<sup>3</sup>/s); no flow at times in 1921, 1952-53, 1965, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1853, 47.5 ft (14.48 m) Aug. 6, 1906, discharge, about 246,000 ft<sup>3</sup>/s (6,970 m<sup>3</sup>/s), from information by local resident. Other large floods are known to have occurred in June 1853, August 1882, and April 1900.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,720 ft<sup>3</sup>/s (77.0 m<sup>3</sup>/s) May 15, gage height, 6.88 ft (2.097 m); minimum, 2.5 ft<sup>3</sup>/s (0.071 m<sup>3</sup>/s) Mar. 15, 16, Sept. 26, 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	41	62	68	65	54	24	248	87	70	60	77
2	23	45	61	74	65	56	22	243	80	76	60	71
3	23	42	59	69	65	57	17	238	77	77	60	70
4	28	41	60	66	63	55	16	242	74	74	60	73
5	47	38	61	64	63	56	19	256	76	71	60	69
6	38	33	61	65	62	58	17	246	76	67	60	74
7	47	32	61	65	62	55	15	138	84	67	60	77
8	52	31	62	66	67	52	18	141	90	66	60	77
9	38	29	61	65	65	32	20	191	68	70	60	74
10	41	28	61	66	62	27	20	146	66	70	62	73
11	52	26	61	63	63	25	22	221	67	69	65	75
12	44	28	62	67	62	24	23	142	69	66	67	78
13	40	34	63	66	58	24	26	614	68	76	71	72
14	31	40	66	66	56	23	57	2560	63	65	76	71
15	33	36	64	63	58	9.7	161	2550	61	58	76	75
16	31	32	65	64	60	2.6	326	187	64	60	69	71
17	32	30	64	60	58	3.3	437	119	62	63	70	71
18	32	28	65	63	56	11	290	118	63	62	69	72
19	34	28	65	65	56	16	264	103	67	60	73	69
20	33	29	66	62	58	19	241	258	64	60	75	53
21	32	27	66	62	58	19	236	868	64	67	82	46
22	31	25	68	67	60	21	802	1320	77	80	77	21
23	32	34	66	73	60	21	2380	190	89	78	74	9.0
24	32	35	68	68	59	21	2390	91	89	74	74	4.8
25	31	58	69	65	57	20	325	89	86	65	70	3.5
26	30	72	69	64	56	53	281	90	94	60	70	2.8
27	79	68	70	63	56	77	251	87	83	58	74	2.6
28	149	71	68	63	56	36	251	86	80	56	141	2.7
29	240	68	68	62	---	31	246	86	72	56	108	2.8
30	63	62	70	67	---	24	264	103	71	58	90	8.5
31	46	---	68	67	---	23	---	88	---	58	87	---
TOTAL	1485	1191	2000	2028	1686	1005.6	9461	12059	2231	2057	2260	1545.7
MEAN	47.9	39.7	64.5	65.4	60.2	32.4	315	389	74.4	66.4	72.9	51.5
MAX	240	72	70	74	67	77	2390	2560	94	80	141	78
MIN	21	25	59	60	56	2.6	15	86	61	56	60	2.6
AC-FT	2950	2360	3970	4020	3340	1990	18770	23920	4430	4080	4480	3070
CAL YR 1976	TOTAL	12662.0	MEAN	34.6	MAX	240	MIN	1.8	AC-FT	25120		
WTR YR 1977	TOTAL	39009.3	MEAN	107	MAX	2560	MIN	2.6	AC-FT	77370		

## COLORADO RIVER BASIN

08136150 CONCHO RIVER NEAR VERIBEST, TX  
(Low-flow partial-record station)

LOCATION.--Lat 31°32'07", long 100°13'05", Tom Green County, Hydrologic Unit 12090105, at bridge on county road, 2.8 mi (4.5 km) downstream from Crownest Creek, 4.5 mi (7.2 km) northeast of Veribest, and 17.3 mi (27.8 km) downstream from gaging station near San Angelo.

PERIOD OF RECORD.--Periodic discharge measurements: April 1970 to April 1974. Periodic water-quality data: February 1968 to current year.

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA, MG)
OCT 12...	1800	35	1760	8.3	20.5	9.9	114	3.5	470
DEC 06...	1830	56	1800	7.8	9.5	11.1	101	1.9	460
FEB 23...	0815	60	1680	7.8	14.0	9.1	92	1.9	440
APR 18...	1730	350	1260	7.5	20.0	8.0	91	4.0	300
JUN 13...	1845	55	1270	8.2	29.0	9.4	124	3.3	350
AUG 02...	1015	52	1210	8.1	28.0	6.9	88	2.3	330

DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)
OCT 12...	250	110	48	180	3.6	4.8	268	0	140
DEC 06...	240	110	46	200	4.0	5.0	278	0	140
FEB 23...	210	100	45	170	3.5	5.0	277	0	140
APR 18...	150	70	31	130	3.3	4.8	180	0	100
JUN 13...	170	81	37	130	3.0	4.9	230	0	110
AUG 02...	150	77	33	120	2.9	5.2	220	0	98

DATE	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)
OCT 12...	350	.5	20	985	3.0	.02	.01	1.1	.06
DEC 06...	350	.4	19	1010	3.4	.02	.03	.97	.06
FEB 23...	320	.4	12	929	2.6	.02	.04	.78	.05
APR 18...	260	.3	9.6	694	.21	.01	.16	1.2	.18
JUN 13...	230	.5	15	722	1.4	.04	.02	.85	.12
AUG 02...	210	.5	19	671	1.1	.03	.01	.72	.07

## COLORADO RIVER BASIN

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## 08136500 CONCHO RIVER AT PAINT ROCK, TX

LOCATION.--Lat 31°30'57", long 99°55'09", Concho County, Hydrologic Unit 12090105, near left bank on downstream end of pier of bridge on U.S. Highway 83, 0.5 mi (0.8 km) north of Concho County Courthouse in Paint Rock, 2.7 mi (4.3 km) downstream from Kickapoo Creek, and 19.6 mi (31.5 km) upstream from station.

DRAINAGE AREA.--6,415 mi<sup>2</sup> (16,615 km<sup>2</sup>), of which 1,283 mi<sup>2</sup> (3,323 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1915 to current year. Prior to October 1970, published as "near Paint Rock".

REVISED RECORDS.--WSP 458: 1915-16. WSP 568: 1919-20. WSP 1712: 1922(M). WSP 1732: 1918(M), 1923(M). WSP 1922: Drainage area.

GAGE.--Water-stage recorder with masonry dam control. Datum of gage is 1,574.36 ft (479.865 m) above mean sea level. See WSP 1922 for history of changes prior to Jan. 15, 1940.

REMARKS.--Water-discharge records good. Many diversions above station for irrigation and municipal supply. Regulation same as that for Concho River at San Angelo (station 08136000).

AVERAGE DISCHARGE.--47 years (water years 1916-62) prior to construction of Twin Buttes Dam, 210 ft<sup>3</sup>/s (5.947 m<sup>3</sup>/s), 152,100 acre-ft/yr (188 hm<sup>3</sup>/yr); 15 years (water years 1963-77) regulated, 54.5 ft<sup>3</sup>/s (1.543 m<sup>3</sup>/s), 39,490 acre-ft/yr (48.7 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 301,000 ft<sup>3</sup>/s (8,520 m<sup>3</sup>/s) Sept. 17, 1936, gage height, 43.4 ft (13.23 m), from flood-marks, from rating curve extended above 98,000 ft<sup>3</sup>/s (2,780 m<sup>3</sup>/s) on basis of slope-area measurements of 144,000 and 301,000 ft<sup>3</sup>/s (4,080 and 8,520 m<sup>3</sup>/s); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1853, that of Sept. 17, 1936. Flood in August 1882 reached a stage of about 39.9 ft (12.16 m), and flood in August 1906 reached a stage of 39.5 ft (12.04 m), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,010 ft<sup>3</sup>/s (85.2 m<sup>3</sup>/s) May 15, gage height, 15.34 ft (4.676 m); minimum, 17 ft<sup>3</sup>/s (0.48 m<sup>3</sup>/s) Mar. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	62	150	118	125	124	92	56	470	174	82	94	96
2	62	115	115	129	121	90	50	380	291	81	83	92
3	61	101	115	132	115	83	50	358	171	84	80	100
4	70	96	112	135	114	79	48	347	147	90	76	98
5	80	92	112	129	112	80	44	351	140	85	69	94
6	80	89	115	126	111	77	38	365	133	74	66	96
7	98	84	113	125	113	76	35	358	134	76	70	94
8	95	79	114	126	128	76	31	227	125	66	75	108
9	97	79	115	125	124	71	31	208	118	66	77	109
10	94	79	115	125	124	67	28	250	111	72	79	107
11	80	78	112	126	122	52	35	221	106	75	80	106
12	73	75	119	133	118	51	35	300	108	75	81	105
13	70	82	126	134	118	49	35	223	108	74	82	103
14	68	85	130	133	115	45	43	1570	110	74	83	107
15	70	93	139	125	112	43	411	2940	102	80	91	94
16	68	97	135	123	110	36	817	1930	95	67	96	90
17	68	92	135	120	111	36	1540	316	84	59	89	93
18	68	88	135	118	110	28	731	230	84	67	86	89
19	69	85	135	115	106	23	471	214	89	70	82	88
20	68	86	132	119	105	19	421	194	94	66	83	86
21	72	84	129	120	107	18	428	457	91	62	86	75
22	74	82	130	121	109	24	383	1290	90	78	86	62
23	73	79	125	125	99	30	1720	1440	91	206	96	56
24	75	79	125	129	97	30	2730	287	279	134	102	43
25	73	86	130	129	95	33	1890	188	239	110	113	33
26	70	93	126	123	91	38	408	176	292	98	92	28
27	78	114	128	120	88	93	358	166	158	89	84	26
28	117	120	129	117	89	144	342	169	131	83	83	24
29	302	117	126	112	---	121	471	162	108	79	108	23
30	495	121	128	115	---	78	1150	298	91	79	162	23
31	260	---	125	120	---	60	---	230	---	102	110	---
TOTAL	3190	2800	3843	3854	3088	1842	14830	16315	4094	2603	2744	2348
MEAN	103	93.3	124	124	110	59.4	494	526	136	84.0	88.5	78.3
MAX	495	150	139	135	128	144	2730	2940	292	206	162	109
MIN	61	75	112	112	88	18	28	162	84	59	66	23
AC-FT	6330	5550	7620	7640	6130	3650	29420	32360	8120	5160	5440	4660
CAL YR 1976	TOTAL	25707.32	MEAN	70.2	MAX	495	MIN	.45	AC-FT	50990		
WTR YR 1977	TOTAL	61551.00	MEAN	169	MAX	2940	MIN	18	AC-FT	122100		

## COLORADO RIVER BASIN

08136500 CONCHO RIVER AT PAINT ROCK, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1967 to current year. Pesticide analyses: October 1967 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to current year.

WATER TEMPERATURES: October 1967 to current year.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 3,110 micromhos Apr. 20, 24, 25, 1974; minimum daily, 360 micromhos Nov. 1, 1974.

WATER TEMPERATURES (1967-73, 1975-77): Maximum daily, 35.0°C Aug. 11, 1969; minimum daily, 0.0°C on many days during winter months.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,280 micromhos Apr. 14; minimum daily, 700 micromhos May 15.

WATER TEMPERATURES: Maximum daily, 31.0°C Sept. 8; minimum daily, 2.0°C Jan. 9.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA, MG)
OCT 12...	1715	75	2070	8.3	20.0	5	38	9.1	103	1.9	630
NOV 30...	1000	110	1960	8.2	10.0	--	--	--	--	--	560
DEC 06...	1725	105	1970	7.9	9.0	5	20	11.1	100	1.3	590
FEB 23...	1000	110	1850	7.8	14.5	0	20	8.5	87	1.6	530
MAR 31...	1500	51	2190	8.0	15.0	--	--	--	--	--	610
APR 18...	1621	620	1190	7.9	20.0	10	80	8.6	98	2.0	320
MAY 16...	1130	2920	752	7.9	23.0	--	--	--	--	--	240
JUN 13...	1700	88	1550	8.2	29.0	5	20	13.2	174	5.3	440
AUG 02...	1110	74	1450	8.2	30.0	0	35	8.0	107	2.9	400
SEP 19...	1005	88	1470	8.1	26.0	--	--	--	--	--	430
DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 12...	410	140	67	200	3.5	4.6	260	0	220	400	.6
NOV 30...	350	130	58	190	3.5	5.1	262	0	200	400	.5
DEC 06...	380	140	59	180	3.2	4.8	263	0	200	390	.6
FEB 23...	310	120	55	200	3.8	4.7	260	0	190	360	.5
MAR 31...	420	140	64	200	3.5	4.3	240	0	250	450	.6
APR 18...	160	77	30	110	2.7	5.1	192	0	96	220	.3
MAY 16...	62	59	23	61	1.7	5.1	220	0	55	99	.4
JUN 13...	280	94	50	150	3.1	5.1	190	0	180	290	.5
AUG 02...	230	85	45	140	3.1	5.0	200	0	160	260	.6
SEP 19...	250	90	49	130	2.7	5.0	220	0	150	250	.6

COLORADO RIVER BASIN

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08136500 CONCHO RIVER AT PAINT ROCK, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 12...	21	1180	70	14	7.4	.04	.03	.97	.04	4.7
NOV 30...	18	1130	--	--	--	--	--	--	--	--
DEC 06...	17	1120	25	2	7.6	.02	.01	1.2	.03	6.5
FEB 23...	13	1070	29	3	7.5	.02	.02	.81	.03	2.2
MAR 31...	10	1240	--	--	--	--	--	--	--	--
APR 18...	11	644	144	18	.54	.01	.09	1.2	.13	16
MAY 16...	13	424	--	--	--	--	--	--	--	--
JUN 13...	16	879	41	9	4.1	.10	.02	1.1	.12	19
AUG 02...	20	815	43	15	2.1	.09	.01	1.1	.06	5.3
SEP 19...	21	804	--	--	--	--	--	--	--	--

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
OCT 12...	1715	3	200	2	0	1	0
FEB 23...	1000	2	100	0	9	0	0
JUN 13...	1700	3	100	2	0	2	20
AUG 02...	1110	2	400	0	0	5	50

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
OCT 12...	0	20	.0	3	0	10
FEB 23...	0	0	.0	2	0	0
JUN 13...	0	10	.0	5	0	8
AUG 02...	0	20	1.6	2	0	10



## COLORADO RIVER BASIN

08136500 CONCHO RIVER AT PAINT ROCK, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
FEB 23...	1000	.0	--	.00	.00	--	.0	--	.00	--	.00	--
APR 18...	1621	--	0	--	--	.0	--	0	--	1.9	--	13
AUG 02...	1110	.0	0	.00	.00	.0	.0	0	.00	.8	.00	14
DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
FEB 23...	.00	--	.00	.00	--	.00	--	.00	.00	--	.00	--
APR 18...	--	.0	--	--	.3	--	.0	--	--	.0	--	.0
AUG 02...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
FEB 23...	.00	--	.00	.00	.00	.00	0	--	.00	.00	.00	.00
APR 18...	--	.2	--	--	--	--	--	0	--	--	--	--
AUG 02...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA,MG) (MG/L)
OCT. 1976.....	3190	1880	1090	9420	370	3180	200	1740	560
NOV. 1976.....	2800	1850	1060	8040	360	2730	200	1520	540
DEC. 1976.....	3843	1820	1030	10700	360	3690	200	2040	530
JAN. 1977.....	3854	1790	1020	10600	350	3640	190	2020	520
FEB. 1977.....	3088	1830	1040	8680	360	3000	200	1650	540
MAR. 1977.....	1842	1960	1140	5670	390	1930	210	1070	590
APR. 1977.....	14830	1010	580	23000	180	7170	100	4160	290
MAY 1977.....	16315	932	530	23200	160	6900	94	4130	270
JUNE 1977.....	4094	1360	770	8500	250	2810	140	1600	390
JULY 1977.....	2603	1420	800	5640	270	1890	150	1050	400
AUG. 1977.....	2744	1450	820	6090	280	2040	160	1150	410
SEPT 1977.....	2348	1480	830	5290	280	1780	160	1000	420
TOTAL .....	61551	**	**	125000	**	40800	**	23100	**
WTD.AVG. ....	168.63	1320	750	**	250	**	140	**	380

08136500 CONCHO RIVER AT PAINT ROCK, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1910	1570	1760	1470	1780	1840	2170	1100	1450	1420	1470	1460
2	2050	1600	1960	1520	1790	1890	2180	1120	1100	1410	1460	1450
3	2060	1630	1870	1690	1800	1840	2170	1110	1210	1400	1470	1400
4	2040	1640	1820	1630	1820	1890	2200	1100	1120	1420	1460	1380
5	2080	1630	1830	1660	1800	1900	2210	1130	1150	1430	1480	1430
6	2060	1670	1890	1630	1780	1890	2220	1150	1300	1530	1460	1440
7	2070	1690	1920	1820	1800	1860	2200	1140	1360	1550	1470	1450
8	2080	1770	1810	1740	1800	1840	2250	1160	1430	1540	1460	1470
9	2060	1800	1860	1780	1840	1850	2220	1170	1490	1530	1510	1480
10	2050	1750	1930	1810	1860	1870	2240	1220	1530	1520	1490	1500
11	2060	1800	1960	1850	1840	1920	2250	1280	1540	1530	1500	1510
12	2070	1790	1950	1830	1830	1890	2240	1350	1550	1540	1520	1490
13	2060	1720	1960	1830	1850	1910	2270	1340	1580	1550	1510	1500
14	2050	1710	1700	1820	1830	1940	2280	850	1570	1540	1500	1490
15	2090	1860	1550	1840	1860	1950	982	700	1570	1500	1490	1480
16	2070	1940	1780	1850	1840	1960	974	775	1590	1520	1480	1470
17	2030	1990	1760	1870	1860	1970	918	865	1600	1530	1490	1470
18	2050	2020	1810	1860	1840	2010	1120	991	1610	1510	1500	1480
19	2040	2060	1740	1870	1830	1990	1240	1100	1620	1500	1490	1470
20	2050	2030	1760	1850	1840	2010	1330	1180	1630	1480	1480	1480
21	2050	2050	1700	1860	1830	2020	1290	895	1640	1500	1470	1500
22	2040	2060	1800	1870	1840	2030	1140	820	1630	1410	1490	1510
23	2020	2030	1840	1860	1850	2050	980	811	1650	1080	1480	1520
24	2030	2000	1850	1800	1860	2100	824	856	1210	1130	1450	1530
25	2020	1990	1860	1860	1840	2090	821	955	1220	1250	1390	1540
26	2030	2000	1700	1850	1860	2070	950	1050	1070	1370	1410	1550
27	2040	1920	1780	1860	1830	2050	1040	1180	1220	1430	1430	1560
28	1920	1890	1810	1850	1870	2070	1130	1270	1350	1470	1450	1570
29	1740	2000	1760	1840	---	2110	1150	1350	1400	1500	1380	1590
30	1450	1990	1810	1830	---	2130	900	1430	1440	1520	1260	1610
31	1510	---	1860	1850	---	2150	---	1350	---	1430	1440	---
MEAN	2000	1850	1820	1790	1830	1970	1600	1090	1430	1450	1460	1490

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24.0	22.0	9.0	8.0	5.0	12.0	15.0	23.0	28.0	28.0	28.0	28.0
2	25.0	23.0	8.0	8.0	6.0	14.0	---	24.0	29.0	27.0	29.0	29.0
3	24.0	22.0	8.0	8.0	7.0	13.0	17.0	24.0	26.0	28.0	28.0	---
4	20.0	20.0	9.0	8.0	9.0	13.0	14.0	24.0	26.0	27.0	28.0	---
5	17.0	15.0	8.0	7.0	11.0	12.0	15.0	23.0	25.0	26.0	28.0	26.0
6	18.0	16.0	7.0	7.0	11.0	13.0	17.0	15.5	26.0	27.0	29.0	29.0
7	13.0	16.0	7.0	7.0	10.0	13.0	17.0	16.0	27.0	27.0	29.0	29.0
8	14.0	15.0	8.0	5.0	10.0	16.0	17.0	16.0	28.0	28.0	28.0	31.0
9	16.0	15.0	8.0	2.0	11.0	14.0	17.0	16.5	27.0	28.0	28.0	30.0
10	17.0	15.0	9.0	4.0	11.0	15.0	18.0	15.5	28.0	29.0	29.0	30.0
11	19.0	13.0	8.0	4.0	12.0	16.0	18.0	16.0	29.0	28.0	28.0	27.0
12	20.0	12.0	8.0	4.0	12.0	17.0	16.0	16.5	28.0	28.0	28.0	29.0
13	21.0	11.0	7.0	4.0	12.0	18.0	16.0	---	28.0	28.0	29.0	28.0
14	21.0	13.0	10.0	5.0	10.0	20.0	17.0	---	28.0	29.0	28.0	28.0
15	21.0	10.0	10.0	7.0	11.0	19.0	15.0	22.0	28.0	29.0	29.0	28.0
16	19.0	10.0	10.0	7.0	13.0	17.0	16.0	22.0	---	29.0	28.0	28.0
17	21.0	10.0	9.0	9.0	13.0	20.0	16.0	22.5	29.0	29.0	29.0	28.0
18	22.0	9.0	9.0	9.0	14.0	20.0	19.0	22.0	28.0	29.0	29.0	30.0
19	22.0	10.0	9.0	7.0	14.0	17.0	20.0	22.0	27.0	29.0	29.0	30.0
20	21.0	12.0	8.0	8.0	14.0	15.0	20.0	21.0	26.0	29.0	29.0	28.0
21	22.0	13.0	7.0	9.0	14.0	15.0	20.0	22.0	26.0	29.0	28.0	30.0
22	23.0	11.0	9.0	8.0	14.0	15.0	20.0	22.0	25.0	30.0	29.0	30.0
23	21.0	12.0	11.0	8.0	13.0	13.0	20.0	22.0	25.0	29.0	29.0	30.0
24	21.0	11.0	11.0	9.0	14.0	16.0	20.0	22.0	24.0	28.0	29.0	30.0
25	22.0	10.0	10.0	10.0	14.0	17.0	20.0	23.0	25.0	---	29.0	30.0
26	20.0	9.0	9.0	10.0	13.0	15.0	20.0	24.0	26.0	---	28.0	30.0
27	17.0	9.0	10.0	10.0	12.0	14.0	20.0	25.0	26.0	---	29.0	30.0
28	16.0	10.0	10.0	8.0	14.0	16.0	21.0	27.0	28.0	---	28.0	30.0
29	19.0	11.0	9.0	6.0	---	17.0	20.0	28.0	28.0	---	28.0	30.0
30	21.0	10.0	10.0	6.0	---	17.0	21.0	26.0	29.0	---	28.0	30.0
31	22.0	---	10.0	5.0	---	15.0	---	28.0	---	---	28.0	---
MEAN	20.0	13.0	9.0	7.0	11.5	15.5	18.0	21.5	27.0	28.5	28.5	29.0

## COLORADO RIVER BASIN

08136700 COLORADO RIVER NEAR STACY, TX  
(National stream-quality accounting network)

LOCATION.--Lat 31°29'37", long 99°34'25", Coleman-McCulloch County line, Hydrologic Unit 12090106, on left bank at downstream side of bridge on Farm Road 503, 1.2 mi (1.9 km) upstream from Bois d'Arc Creek, 1.8 mi (2.9 km) northeast of Stacy, 24 mi (39 km) downstream from Concho River, and at mile 604.8 (973.1 km).

DRAINAGE AREA.--24,040 mi<sup>2</sup> (62,260 km<sup>2</sup>), approximately, of which 12,880 mi<sup>2</sup> (33,360 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1968 to current year. Prior to October 1970, published as "at Stacy".

GAGE.--Water-stage recorder. Datum of gage is 1,394.66 ft (425.092 m) above mean sea level (State Highway Department bridge plans).

REMARKS.--Water-discharge records good. Many diversions above station for municipal, irrigation, and oilfield operation uses. Effluent from numerous sewage plants is returned to the river. Flow is affected by reservoirs upstream (see stations 08126500 and 08136000) and at times by discharge from the flood-detention pools of 40 floodwater-retarding structures with a combined detention capacity of 54,040 acre-ft (66.6 hm<sup>3</sup>). These structures control runoff from 260 mi<sup>2</sup> (673 km<sup>2</sup>).

AVERAGE DISCHARGE.--9 years (water years 1969-77), 226 ft<sup>3</sup>/s (6.400 m<sup>3</sup>/s), 163,700 acre-ft/yr (202 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,200 ft<sup>3</sup>/s (629 m<sup>3</sup>/s) Sept. 19, 1974, gage height, 16.68 ft (5.084 m); no flow June 22 to Aug. 3, 1974.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1882, 356,000 ft<sup>3</sup>/s (10,100 m<sup>3</sup>/s) Sept. 18, 1936, gage height, 64.59 ft (19.687 m), by slope-area measurement of peak flow. The flood of Sept. 18, 1936, was 4 ft (1.2 m) higher than the 1906 flood and 7 to 8 ft (2.1 to 2.4 m) higher than the 1882 flood, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,700 ft<sup>3</sup>/s (190 m<sup>3</sup>/s) June 24, gage height, 10.68 ft (3.255 m); minimum, 25 ft<sup>3</sup>/s (0.708 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	149	899	170	167	162	128	174	1330	309	178	113	142
2	133	584	170	167	164	128	151	813	261	152	122	117
3	115	406	168	168	165	134	134	652	459	132	116	108
4	106	345	165	170	164	126	116	577	289	122	99	104
5	110	289	165	175	162	118	108	522	218	122	94	106
6	108	247	164	175	161	116	107	508	190	122	89	102
7	108	218	162	175	160	115	100	504	175	113	82	102
8	123	189	162	172	160	115	90	485	161	105	79	106
9	143	174	164	167	164	112	85	373	152	101	79	105
10	151	166	165	162	173	110	81	337	140	92	85	106
11	160	158	165	165	175	106	74	357	131	90	90	110
12	155	155	165	167	172	100	71	410	123	92	90	110
13	141	155	165	173	167	90	72	351	119	95	91	106
14	130	156	171	178	166	87	79	2920	117	95	94	104
15	127	161	173	182	165	87	104	2860	115	96	93	104
16	120	163	178	183	155	83	1450	1110	112	98	92	109
17	116	171	183	177	151	82	2570	294	104	101	101	100
18	120	173	183	170	150	74	2570	260	95	92	106	97
19	133	173	183	167	149	68	1370	245	87	82	102	106
20	127	170	183	165	147	62	1010	227	83	87	102	96
21	124	163	183	165	145	52	2120	575	89	89	104	95
22	122	158	181	166	143	43	1590	1550	90	108	102	93
23	118	154	177	167	135	40	1140	878	92	94	101	85
24	116	152	175	168	133	38	3050	321	2050	199	105	72
25	113	146	174	174	134	46	3050	245	647	287	112	66
26	113	144	173	175	133	57	1210	230	529	214	125	57
27	118	148	173	174	129	133	598	216	468	174	121	47
28	140	151	173	168	126	338	532	210	382	150	108	40
29	252	167	173	165	---	464	534	199	295	140	102	34
30	2240	170	171	165	---	309	1860	194	225	133	100	28
31	1950	---	167	165	---	221	---	271	---	112	152	---
TOTAL	7981	6705	5324	5277	4310	3782	26200	20024	8307	3867	3151	2757
MEAN	257	224	172	170	154	122	873	646	277	125	102	91.9
MAX	2240	899	183	183	175	464	3050	2920	2050	287	152	142
MIN	106	144	162	162	126	38	71	194	83	82	79	28
AC-FT	15830	13300	10560	10470	8550	7500	51970	39720	16480	7670	6250	5470
CAL YR 1976	TOTAL	55969.9	MEAN 153	MAX 2240	MIN 1.6	AC-FT 111000						
WTR YR 1977	TOTAL	97685.0	MEAN 268	MAX 3050	MIN 28	AC-FT 193800						

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1968 to current year.

WATER TEMPERATURES: April 1968 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 3,580 micromhos Sept. 23, 1970; minimum daily, 188 micromhos July 29, 1971.

WATER TEMPERATURES: Maximum daily, 33.5°C July 18, 1971; minimum daily, 2.0°C Jan. 8, 1970, Dec. 16, 1972, and Jan. 12, 1973.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,520 micromhos Apr. 3; minimum daily, 529 micromhos June 24.

WATER TEMPERATURES: Maximum daily, 29.5°C July 25-26.

[illegible]

## COLORADO RIVER BASIN

08136700 COLORADO RIVER NEAR STACY, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS- SOLVED SILICA (SIO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUS- PENDE SEDI- MENT (MG/L)	SUS- PENDE SEDI- MENT CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT 13...	16	1040	995	2.7	.03	.04	1.2	.07	7.2	286	93	66
NOV 01...	9.9	587	540	2.8	.01	.06	2.3	.12	--	979	2220	99
DEC 06...	--	--	--	7.4	.02	.02	.75	.02	--	73	34	95
JAN 03...	11	1180	1140	1.7	.01	.00	.61	.03	--	39	18	76
FEB 22...	7.0	1080	1120	5.2	.02	.02	.68	.05	3.1	55	22	98
MAR 14...	4.3	1250	1190	4.5	.03	.04	.76	.03	--	92	35	93
APR 19...	--	--	--	.75	.01	.06	2.2	.43	6.8	505	1910	100
MAY 02...	--	--	--	1.1	.01	.11	.47	.03	--	288	607	100
JUN 13...	13	706	683	.79	.02	.02	.88	.10	19	58	20	84
JUL 11...	16	1010	927	.24	.02	.08	1.5	.07	--	32	6.9	92
AUG 02...	17	905	814	.37	.03	--	--	.07	8.3	95	26	94
30...	--	--	--	1.7	.04	--	--	.05	--	54	16	99

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)
OCT 13...	1000	3	2	--	200	0	3	10	0
MAR 14...	1145	1	1	--	100	0	0	10	0
JUN 13...	1605	3	2	--	100	<10	1	10	0
AUG 02...	1530	4	3	500	400	10	0	0	0

DATE	TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)
OCT 13...	0	0	5	1	680	0	5	0	50
MAR 14...	0	0	0	0	640	10	3	0	20
JUN 13...	<50	0	190	2	1100	30	<100	1	10
AUG 02...	<50	0	10	2	410	30	<100	0	80

DATE	DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
OCT 13...	20	.1	.0	2	2	--	0	170	10
MAR 14...	10	.0	.0	4	3	--	0	10	0
JUN 13...	8	.4	.0	3	3	--	0	130	10
AUG 02...	0	.0	.0	2	1	<10	0	10	0



## COLORADO RIVER BASIN

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08136700 COLORADO RIVER NEAR STACY, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	P,P' DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	P,P' DDE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)
NOV 01...	1130	ND	ND	ND	2	ND	.5	ND	8.0	ND	--	ND
FEB 23...	1800	ND	--	ND	--	ND	--	ND	--	ND	--	ND
MAY 02...	1245	ND	ND	ND	ND	ND	.7	ND	7.9	ND	ND	ND
AUG 02...	1530	ND	--	ND	--	ND	--	ND	--	ND	--	ND
DATE		DI- AZINON IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	ETHION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
NOV 01...	--	ND	.3	ND	ND	ND	--	ND	ND	ND	ND	ND
FEB 23...	--	ND	--	ND	--	ND	--	ND	--	.01	--	--
MAY 02...	ND	ND	.2	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 02...	--	ND	--	ND	--	ND	--	ND	--	ND	--	--
DATE		TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	MALA- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL METHOXY- CHLOR (UG/L)	METHOXY- CHLOR IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL METHYL PARATHION (UG/L)	METHYL PARATHION IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL METHYL TRITHION (UG/L)	METHYL TRITHION IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL PARA- THION (UG/L)
NOV 01...	.02	ND	ND	--	ND	ND	ND	ND	--	ND	--	ND
FEB 23...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND
MAY 02...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 02...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	ND
DATE		PARA- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TRI- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ATRA- ZINE (UG/L)	SIMA- ZINE TOTAL COUL- SON COND. (UG/L)	SIMA- ZINE IN BOTTOM MA- TERIAL (UG/ KG DRY SOLIDS)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 01...	--	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND
FEB 23...	--	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND
MAY 02...	ND	ND	ND	ND	ND	ND	ND	ND	ND	.40	ND	ND
AUG 02...	--	ND	--	ND	--	ND	ND	ND	--	ND	ND	ND

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO AUGUST 1977

DATE TIME	OCT 13,76 1000		NOV 1,76 1130		DEC 6,76 1635		JAN 3,77 1230		FEB 22,77 1800	
TOTAL CFLLS/ML	63000		6200		9500		18000		6100	
DIVERSITY: DIVISION	1.1		1.5		1.6		1.5		1.4	
..CLASS	1.1		1.5		1.7		1.5		1.4	
..ORDER	1.9		2.3		2.0		2.2		1.8	
...FAMILY	2.3		2.6		2.4		2.3		2.3	
....GENUS	3.0		3.1		2.6		2.6		3.1	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES	--	-	--	-	--	-	--	-	--	-
...CHARACIACEAE										
...SCHROEDERIA	--	-	--	-	--	-	--	-	*	0
...COELASTRACEAE										
...COELASTRUM	930	1	--	-	--	-	--	-	--	-
...HYDRODICTYACEAE										
...PEDIASTRUM	--	-	--	-	--	-	--	-	--	-
...MICRACTINIACEAE										
...GOLFENKINIA	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE										
...ANKISTRODESMUS	810	1	140	2	290	3	220	1	1300#	22
...CHLORELLA	--	-	--	-	--	-	--	-	*	0
...CHODATELLA	--	-	--	-	--	-	--	-	--	-
...DICTYOSPHAERIUM	3300	5	190	3	630	7	--	-	--	-
...FRANCEIA	--	-	--	-	--	-	--	-	*	0
...KIRCHNERIELLA	--	-	--	-	--	-	--	-	--	-
...NEPHROCYTIUM	--	-	--	-	--	-	--	-	--	-
...OOCYSTIS	--	-	190	3	--	-	290	2	380	6
...POLYDRIOPSIS	--	-	--	-	--	-	--	-	--	-
...QUADRIGULA	--	-	--	-	--	-	--	-	--	-
...SELENASTRUM	--	-	--	-	--	-	--	-	350	6
...TETRAEDRON	*	0	--	-	*	0	--	-	*	0
...TRIFURARIA	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE										
...ACTINASTRUM	1400	2	--	-	--	-	--	-	--	-
...CRUCIGENIA	930	1	--	-	490	5	1000	6	380	6
...SCENEDESMUS	4700	7	380	6	850	9	860	5	760	13
...TETRASTRUM	--	-	--	-	--	-	*	0	*	0
..TETRASPORALES										
...PALMELLACEAE										
...SPHAEROCYSTIS	1200	2	--	-	--	-	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
...CARTERIA	1400	2	--	-	--	-	--	-	--	-
...CHLAMYDOMONAS	580	1	47	1	730	8	430	2	--	-
...CHLOROGONIUM	--	-	--	-	--	-	--	-	--	-
...PHACOTACEAE										
...PHACOTUS	--	-	--	-	--	-	--	-	*	0
..ZYGNEATALES										
...DESMIDIACEAE										
...COSMARIUM	*	0	--	-	--	-	--	-	--	-
...SPHAEROZOSMA	--	-	--	-	--	-	--	-	--	-
CHRYSTOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCACEAE										
...CYCLOTELLA	--	-	240	4	170	2	--	-	*	0
...MELOSIRA	*	0	380	6	--	-	570	3	--	-
..PENNIALES										
...ACHNANTHACEAE										
...COCCONEIS	--	-	--	-	--	-	--	-	--	-
...CYMBELLACEAE										
...CYMBELLA	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE										
...SYNEDRA	--	-	--	-	73	1	--	-	--	-
...NAVICULACEAE										
...DIPLONEIS	--	-	--	-	--	-	--	-	--	-
...GYROSIGMA	--	-	47	1	*	0	--	-	--	-
...NAVICULA	*	0	330	5	*	0	140	1	*	0
...NITZSCHIA										
...DENTICULA	--	-	--	-	--	-	--	-	--	-
...NITZSCHIA	2400	4	1500#	24	610	6	2700	15	570	9
..CHRYSTOPHYCEAE										
...CHRYSOMONADALES										
...OCHROMONADACEAE										
...DINOBRYON	--	-	--	-	--	-	--	-	--	-
...OCHROMONAS	--	-	--	-	--	-	--	-	32	1

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

COLORADO RIVER BASIN

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08136700 COLORADO RIVER NEAR STACY, TX.--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO AUGUST 1977

DATE TIME	OCT 13,76 1000		NOV 1,76 1130		DEC 6,76 1635		JAN 3,77 1230		FEB 22,77 1800	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCCOCCALES										
...CHROCCOCCAEAE										
....AGMENELLUM	22000#	35	380	6	--	-	--	-	--	-
....ANACYSTIS	13000#	21	750	12	*	0	8700#	48	730	12
..HORMOGONALS										
...NOSTOCAEAE	--	-	--	-	--	-	--	-	--	-
....CYLINDROSPERMUM	1700	3	--	-	--	-	--	-	--	-
...OSCILLATORIAEAE	--	-	--	-	--	-	--	-	--	-
....LYNGRYA	--	-	--	-	--	-	1400	8	--	-
....OSCILLATORIA	7100	11	1600#	26	4800#	51	1300	7	1000#	17
....RIVULARIAEAE										
....PAPHIDIOPSIS	--	-	--	-	--	-	--	-	--	-
..HORMOGONALS	--	-	--	-	--	-	--	-	--	-
...CHROCCOCCALES										
...CHROCCOCCAEAE										
....GOMPHOSPHERIA	--	-	--	-	--	-	--	-	510	8
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
...CRYPTOCHRYSIDACEAE										
....CHROOMONAS	--	-	--	-	220	2	500	3	--	-
...CRYPTOMONODACEAE										
....CRYPTOMONAS	350	1	--	-	190	2	--	-	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
...EUGLENACEAE										
....EUGLENA	*	0	--	-	*	0	--	-	--	-
....PHACUS	*	0	--	-	--	-	--	-	--	-
....TRACHELOMONAS	*	0	--	-	240	3	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...GYMNODINIALES										
...GYMNODINIACEAE										
....GYMNODINIUM	--	-	--	-	*	0	--	-	--	-
...PERIDINIALES										
...GLENODINIACEAE										
....GLENODINIUM	*	0	--	-	--	-	*	0	32	1

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%  
 \* - OBSERVED ORGANISM; MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO AUGUST 1977

DATE TIME	MAY 2,77 1245	JUN 13,77 1605	JUL 11,77 1140	AUG 2,77 1530	AUG 30,77 1250					
TOTAL CELLS/ML	3700	160000	1200000	140000	70000					
DIVERSITY: DIVISION	1.7	0.8	0.6	1.1	0.8					
..CLASS	2.1	0.8	0.6	1.1	0.8					
...ORDER	2.2	1.2	1.5	1.7	1.2					
....FAMILY	2.7	1.3	0.0	2.2	1.5					
.....GENUS	3.0	0.0	0.0	2.9	2.1					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES	--	-	--	-	*	0	--	-	--	-
...CHARACIACEAE	--	-	--	-	--	-	--	-	*	0
...SCHROEDERIA	--	-	--	-	--	-	--	-	--	-
...COELASTRACEAE	--	-	--	-	--	-	--	-	--	-
...COELASTRUM	--	-	--	-	--	-	3700	3	4100	6
...HYDRODICTYACEAE	--	-	--	-	--	-	--	-	--	-
...PEDIASTRUM	--	-	*	0	16000	1	5200	4	1300	2
...MICRACTINIACEAE	--	-	--	-	--	-	--	-	--	-
...GOLFENKINIA	--	-	*	0	--	-	--	-	--	-
...OOCYSTACEAE	--	-	--	-	--	-	--	-	--	-
...ANKISTRODESMUS	--	-	1000	1	*	0	1300	1	*	0
...CHLORELLA	--	-	--	-	--	-	--	-	--	-
...CHODATELLA	--	-	--	-	*	0	--	-	--	-
...DICTYOSPHAERIUM	--	-	--	-	19000	2	--	-	--	-
...FRANCEIA	--	-	*	0	*	0	--	-	--	-
...KIRCHNERIELLA	--	-	1500	1	--	-	3500	2	*	0
...NEPHROCYTIUM	--	-	1000	1	--	-	--	-	--	-
...OOCYSTIS	--	-	2000	1	6900	1	870	1	--	-
...POLYDRIOPSIS	--	-	--	-	--	-	--	-	--	-
...QUADRIGULA	--	-	--	-	*	0	--	-	--	-
...SELENASTRUM	--	-	--	-	--	-	--	-	--	-
...TETRAEDRON	--	-	--	-	*	0	*	0	*	0
...TREUBARIA	--	-	--	-	--	-	--	-	*	0
...SCENEDESMACEAE	--	-	--	-	--	-	--	-	--	-
...ACTINASTRUM	--	-	--	-	--	-	--	-	--	-
...CRUCIGENIA	--	-	6100	4	11000	1	*	0	--	-
...SCENEDESMUS	430	12	18000	12	36000	3	15000	11	7000	10
...TETRASTRUM	--	-	*	0	--	-	870	1	*	0
..TETRASPORALES	--	-	--	-	--	-	--	-	--	-
...PALMELLACEAE	--	-	--	-	--	-	--	-	--	-
...SPHAEROCYSTIS	--	-	*	0	--	-	--	-	980	1
..VOLVOCALES	--	-	--	-	--	-	--	-	--	-
...CHLAMYDOMONADACEAE	--	-	--	-	--	-	--	-	--	-
...CARTERIA	--	-	--	-	--	-	--	-	--	-
...CHLAMYDOMONAS	--	-	1000	1	*	0	*	0	--	-
...CHLOROGONIUM	--	-	--	-	*	0	--	-	--	-
...PHACOTACEAE	--	-	--	-	--	-	--	-	--	-
...PHACOTUS	--	-	--	-	--	-	--	-	--	-
..ZYGNEATALES	--	-	--	-	--	-	--	-	--	-
...DESMIDIACEAE	--	-	--	-	--	-	--	-	--	-
...COSMARIUM	--	-	*	0	--	-	--	-	*	0
...SPHAEROZOSMA	--	-	*	0	--	-	--	-	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCACEAE										
...CYCLOTELLA	72	2	*	0	*	0	--	-	--	-
...MELOSIRA	--	-	--	-	--	-	--	-	--	-
..PENNALES										
...ACHNANTHACEAE	--	-	--	-	--	-	--	-	--	-
...COCCONEIS	--	-	--	-	--	-	*	0	--	-
...CYMBELLACEAE	--	-	--	-	--	-	--	-	--	-
...CYMBELLA	140	4	--	-	--	-	--	-	--	-
...FRAGILARIACEAE	--	-	--	-	--	-	--	-	--	-
...SYNEDRA	--	-	--	-	*	0	8300	6	--	-
...NAVICULACEAE	--	-	--	-	--	-	--	-	--	-
...DIPLONEIS	140	4	--	-	--	-	--	-	--	-
...GYROSIGMA	--	-	--	-	--	-	--	-	--	-
...NAVICULA	510	14	--	-	*	0	--	-	--	-
...NITZSCHACEAE	--	-	--	-	--	-	--	-	--	-
...DENTICULA	220	6	--	-	--	-	--	-	--	-
...NITZSCHIA	220	6	1000	1	*	0	--	-	--	-
..CHRYSOPHYCEAE										
...CHRY SOMONADALES										
...OCHROMONADACEAE										
...DINORRYON	580#	16	--	-	--	-	--	-	--	-
...OCHROMONAS	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM: EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED: LESS THAN 1/2%

08136700 COLORADO RIVER NEAR STACY, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO AUGUST 1977

DATE TIME	MAY 2,77 1245		JUN 13,77 1605		JUL 11,77 1140		AUG 2,77 1530		AUG 30,77 1250	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCALES										
...CHROCOCCACEAE										
....AGMENELLUM	--	-	39000#	24	52000	4	40000#	28	13000#	19
....ANACYSTIS	--	-	78000#	49	400000#	34	40000#	28	38000#	54
...HORMOGONALES										
...NOSTOCACEAE	--	-	--	-	25000	2	--	-	--	-
....CYLINDROSPERMUM	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE	--	-	7600	5	--	-	--	-	--	-
....LYNGBYA	--	-	--	-	310000#	27	--	-	4000	6
....OSCILLATORIA	1100#	29	--	-	6900	1	7400	5	--	-
...RIVULARIACEAE										
....RAP-HIDIOPSIS	--	-	--	-	38000	3	15000	10	--	-
...HORMOGONALES	--	-	--	-	210000#	18	--	-	--	-
...CHROCOCCALES										
...CHROCOCCACEAE										
....GOMPHOSPHERIA	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
...CRYPTOCHRYSIDACEAE										
....CHROOMONAS	--	-	--	-	--	-	--	-	--	-
...CRYPTOMONADACEAE										
....CRYPTOMONAS	--	-	*	0	--	-	--	-	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
...EUGLENAEAE										
....EUGLENA	--	-	*	0	*	0	*	0	*	0
....PHACUS	72	2	--	-	--	-	--	-	--	-
....TRACHELOMONAS	220	6	--	-	*	0	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...GYMNODINIALES										
...GYMNODINIACEAE										
....GYMNODINIUM	--	-	--	-	--	-	--	-	--	-
...PERIDINIALES										
...GLENODINIACEAE										
....GLENODINIUM	--	-	*	0	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM; MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	7981	1340	790	17000	230	5000	170	3740	400
NOV. 1976.....	6705	1370	810	14600	240	4320	180	3190	410
DEC. 1976.....	5324	1960	1160	16700	360	5230	280	4030	590
JAN. 1977.....	5277	1960	1160	16500	360	5170	280	3950	590
FEB. 1977.....	4310	1940	1150	13300	360	4180	270	3180	580
MAR. 1977.....	3782	1980	1170	12000	370	3770	290	2920	590
APR. 1977.....	26200	1020	600	42400	160	11700	120	8730	310
MAY 1977.....	20024	976	580	31200	160	8410	110	6180	300
JUNE 1977.....	8307	1090	640	14400	180	4040	130	2970	330
JULY 1977.....	3867	1570	930	9660	280	2940	210	2170	460
AUG. 1977.....	3151	1490	880	7450	260	2240	200	1660	440
SEPT 1977.....	2757	1510	890	6620	270	1990	200	1480	450
TOTAL .....	97685	**	**	202000	**	59000	**	44200	**
WTD. AVG. ....	267.63	1300	770	**	220	**	170	**	390



## COLORADO RIVER BASIN

08136700 COLORADO RIVER NEAR STACY, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	915	987	1990	1950	1950	1960	2040	680	1220	1650	1540	1570
2	891	1060	2000	1940	1960	1990	2310	714	1280	1590	1480	1580
3	861	1070	2020	1930	1970	1870	2520	767	1450	1430	1450	1590
4	1050	1090	2040	1910	1960	1970	2500	913	1550	1450	1430	1580
5	1180	1100	2020	1870	1950	1940	2480	1030	1530	1470	1380	1570
6	1230	1160	2030	1850	1910	1900	2420	1070	1520	1590	1370	1570
7	1300	1200	2040	1910	1870	1860	2300	1110	1350	1720	1440	1560
8	1400	1230	2020	1950	1950	1950	2120	1150	1160	1740	1420	1520
9	1580	1250	2000	1960	1930	1960	2030	1170	1270	1750	1440	1500
10	1770	1290	1900	1940	1910	2000	2010	1170	1240	1700	1450	1490
11	1810	1330	1920	1890	1900	2010	1980	1180	1110	1660	1450	1460
12	1770	1400	1940	1900	1880	2020	1990	1190	1240	1630	1480	1440
13	1730	1460	1950	1910	1910	2030	2000	1260	1140	1600	1510	1480
14	1690	1540	1910	1900	1930	2010	1980	1010	1230	1570	1520	1470
15	1750	1590	1930	1910	1940	2020	1890	880	1300	1550	1530	1450
16	1800	1650	1940	1920	1950	2030	1590	868	1380	1540	1530	1490
17	1840	1550	1950	1960	1930	2040	1010	816	1410	1530	1510	1500
18	1860	1580	1960	1950	1940	2050	858	906	1440	1520	1490	1510
19	1890	1600	1960	1960	1950	2070	1000	979	1460	1540	1510	1480
20	1880	1620	1950	1910	1940	2060	1110	1050	1490	1530	1520	1490
21	1890	1660	1930	1980	1930	2080	900	1070	1500	1520	1530	1460
22	1880	1710	1940	2070	1930	2100	855	1200	1520	1540	1510	1470
23	1800	1740	1950	2180	1940	2120	1120	1050	600	1520	1510	1480
24	1810	1750	1960	2260	1950	2120	750	909	529	1450	1490	1500
25	1820	1810	1950	1960	1960	2160	800	924	880	1510	1480	1480
26	1830	1800	1940	1980	2060	2100	833	955	1430	1570	1490	1490
27	1850	1850	1950	1970	2020	1880	885	991	1440	1680	1500	1500
28	1810	1890	1950	1980	1960	1910	937	1020	1450	1570	1510	1490
29	1730	1920	1940	1960	---	1950	1040	1040	1430	1520	1510	1480
30	1300	1970	1930	1970	---	2020	953	1080	---	1580	1500	1490
31	850	---	1930	1960	---	2030	---	1090	---	1560	1510	---
MEAN	1570	1500	1960	1960	1940	2010	1570	1010	1290	1570	1480	1500

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23.5	10.0	5.5	---	5.5	11.0	15.5	---	26.5	26.5	24.5	24.5
2	24.0	13.5	7.0	---	5.5	9.0	13.0	21.0	25.5	25.5	26.5	25.5
3	24.0	14.5	5.5	---	---	14.5	16.5	21.0	26.5	25.5	25.5	26.5
4	21.0	14.5	5.5	---	5.5	11.0	15.5	22.0	28.0	---	26.5	---
5	20.0	11.0	---	3.5	10.0	9.0	18.5	25.5	---	26.5	25.5	28.0
6	19.0	16.5	---	4.5	---	---	18.0	21.0	26.5	22.0	25.5	25.5
7	---	---	5.5	5.5	4.5	14.5	15.5	23.5	---	25.5	---	28.0
8	15.5	14.5	9.0	4.5	10.0	14.5	18.5	---	28.0	---	28.0	25.5
9	16.5	15.5	6.5	---	9.0	14.5	18.5	24.0	26.5	26.5	25.5	25.5
10	16.5	16.5	5.5	3.5	9.0	15.5	---	25.5	25.5	---	25.5	26.0
11	---	14.5	---	3.5	10.0	---	15.5	25.5	26.5	25.5	28.0	---
12	18.5	---	9.0	---	10.0	14.5	15.5	20.0	25.5	26.5	26.5	25.5
13	20.0	---	7.0	5.5	---	---	16.5	19.0	---	25.5	28.0	26.5
14	20.0	---	8.5	3.5	12.0	18.0	18.5	26.5	---	25.5	---	24.0
15	20.5	---	6.5	3.5	13.0	15.5	---	25.5	26.5	25.5	26.5	28.0
16	16.5	4.5	8.5	---	13.0	---	15.5	24.0	25.5	26.5	24.5	24.0
17	---	6.5	8.5	0.0	10.0	18.5	---	20.0	25.5	26.5	26.5	24.5
18	14.5	10.0	10.0	---	16.5	---	18.5	21.0	25.5	25.5	26.5	---
19	15.5	12.0	---	5.5	13.0	15.5	18.5	24.5	---	26.5	26.5	25.5
20	14.5	12.0	8.0	4.5	---	---	20.0	21.0	---	25.5	25.5	24.5
21	20.0	---	4.5	9.0	14.5	13.0	16.5	20.0	29.0	25.5	---	26.5
22	14.5	11.0	7.0	---	14.5	15.5	---	---	25.5	26.5	25.5	23.5
23	18.5	11.0	4.5	---	---	14.5	20.0	26.5	25.5	26.5	24.0	22.0
24	---	12.0	8.0	4.5	15.5	15.5	---	22.0	---	---	26.5	25.5
25	14.5	14.5	6.5	9.0	14.5	14.5	16.5	21.0	25.5	29.5	24.5	---
26	15.5	15.5	---	10.0	14.5	---	19.0	24.0	---	29.5	25.5	26.5
27	---	---	5.5	9.0	---	15.5	20.0	24.0	26.5	29.5	24.5	25.5
28	---	---	7.0	---	13.0	13.0	19.0	24.5	25.5	29.0	---	25.5
29	---	5.5	5.5	3.5	---	15.5	---	26.5	26.5	28.0	25.5	26.5
30	11.0	3.5	4.5	---	---	16.5	20.0	26.5	25.5	28.0	25.5	25.5
31	---	---	3.5	---	---	14.5	---	26.5	---	---	26.5	---
MEAN	18.0	12.0	6.5	5.0	11.0	14.5	17.5	23.5	26.5	26.5	26.0	25.5

COLORADO RIVER BASIN

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08137000 MUKEWATER CREEK SUBWATERSHED NO. 9 NEAR TRICKHAM, TX

LOCATION.--Lat 31°41'36", Long 99°12'12", Coleman County, Hydrologic Unit 12090106, near center of dam on tributary to East Fork Mukewater Creek, 1.5 mi (2.4 km) upstream from mouth, 4.5 mi (7.2 km) southwest of Bangs, and 7.1 mi (11.4 km) north of Trickham.

DRAINAGE AREA.--4.02 mi<sup>2</sup> (10.41 km<sup>2</sup>).

PERIOD OF RECORD.--January 1961 to September 1977 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 1,500.01 ft (457.203 m) above mean sea level.

REMARKS.--Records good. The pool is formed by a rolled earthfill dam 2,070 ft (631 m) long with a 150-foot-wide (46 m) earthen spillway at the right end of dam. The crest of emergency spillway is at gage height 27.1 ft (8.26 m). The dam was completed in November 1960. The outlet structure consists of a 2- by 4-foot (0.6 by 1 m) uncontrolled concrete drop-inlet structure that is connected to a 19-inch (483 mm) concrete outlet pipe. There are four openings in the top of the drop inlet; the dimensions are 1 by 2 ft (0.3 by 0.6 m) at the upstream and downstream sides, and 1 by 4 ft (0.3 by 1 m) on the right and left sides; the crest of these openings is at gage height 18.2 ft (5.55 m). There is also a sluice gate at the end of an 8-inch (203 mm) pipe that is connected to the upstream side of the drop-inlet structure. Gage height at invert of 8-inch (203 mm) pipe is 10.7 ft (3.26 m). The area and capacity tables are based on a sedimentation survey by the Soil Conservation Service made Dec. 1, 1961. There is a recording rain gage at this site.

AVERAGE INFLOW.--16 years, 560 acre-ft/yr (690,000 m<sup>3</sup>/yr).

AVERAGE OUTFLOW.--16 years, 450 acre-ft/yr (555,000 m<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum inflow, 1,630 ft<sup>3</sup>/s (46.2 m<sup>3</sup>/s), average for 5-minute interval, June 3, 1961, computed from change in pool contents and adjusted for outflow and rainfall on pool surface during time of peak inflow; no inflow most of time each year. Maximum outflow, 39.9 ft<sup>3</sup>/s (1.13 m<sup>3</sup>/s) Sept. 24, 1971, gage height, 25.04 ft (7.632 m); no outflow most of time each year.

EXTREMES FOR CURRENT YEAR.--Maximum inflow, 204 ft<sup>3</sup>/s (5.78 m<sup>3</sup>/s), average for 15-minute interval, Apr. 16, computed and adjusted as explained above, no other peak above base of 150 ft<sup>3</sup>/s (4.25 m<sup>3</sup>/s); no inflow for many days. Maximum outflow, 33.4 ft<sup>3</sup>/s (0.95 m<sup>3</sup>/s) Apr. 16, gage height, 20.50 ft (6.248 m); no outflow for many days.

POOL WATER BUDGET, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
Inflow 1/	22.5	2.5	1.7	2.6	2.9	116	220	1.5	1.0	1.1	1.8	0.4
Outflow	0	0	0	0	0	75.4	206	7.5	0	0	0	0
(+)	+19.3	-5.6	-4.7	-7	-5.1	+35.1	+8.2	-21.2	-19.1	-16.8	-14.4	-11.0
(++)	3.60	.20	.22	1.26	.30	3.66	5.36	.16	1.60	1.65	1.14	.10
CAL YR 1976: Inflow 135												
WTR YR 1977: Inflow 374												
			Outflow 0		+ +31.9		++ 20.30					
			Outflow 289		+ -36.0		++ 19.25					

1/ Inflow adjusted for rainfall on pool and pool losses.

+ Change in contents, in acre-feet.

++ Rainfall, in inches.

## COLORADO RIVER BASIN

## 08138000 COLORADO RIVER AT WINCHELL, TX

LOCATION.--Lat 31°28'04", long 99°09'43", McCulloch-Brown County line, Hydrologic Unit 12090106, near left bank on downstream end of pier of bridge on U.S. Highway 377, 0.3 mi (0.5 km) south of Winchell, 5.9 mi (9.5 km) downstream from Home Creek, and at mile 560.7 (902.2 km).

DRAINAGE AREA.--24,580 mi<sup>2</sup> (63,660 km<sup>2</sup>), approximately, of which 12,880 mi<sup>2</sup> (33,360 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1923 to September 1934 (published as "near Milburn"), January 1939 to current year.

REVISED RECORDS.--WSP 1118: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,264.86 ft (385.529 m) above mean sea level. November 1923 to September 1934, nonrecording gage at site 4.2 mi (6.8 km) downstream at datum 10.14 ft (3.091 m) lower. Jan. 13, 1939, to Mar. 24, 1940, nonrecording gage at present site and datum.

REMARKS.--Water-discharge records good. Many diversions above station for irrigation, municipal supply, and oilfield operation. Flow is affected by reservoirs upstream (see stations 08126500 and 08136000) and at times by discharge from flood-detention pools of 85 floodwater-retarding structures with combined detention capacity of 100,320 acre-ft (124 hm<sup>3</sup>). These structures control runoff from 486 mi<sup>2</sup> (1,259 km<sup>2</sup>).

AVERAGE DISCHARGE.--39 years (water years 1925-34, 1940-68) prior to completion of Robert Lee Dam, 628 ft<sup>3</sup>/s (17.78 m<sup>3</sup>/s), 455,000 acre-ft/yr (561 hm<sup>3</sup>/yr); 9 years (water years 1969-77) partially regulated, 273 ft<sup>3</sup>/s (7.731 m<sup>3</sup>/s), 197,800 acre-ft/yr (244 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 76,100 ft<sup>3</sup>/s (2,160 m<sup>3</sup>/s) Oct. 15, 1930, gage height, 51.8 ft (15.79 m), present site and datum; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Highest stages since 1882 were 62.2 ft (18.96 m) Sept. 19, 1936, and 56.2 ft (17.13 m) Aug. 8, 1906, at railway bridge 1,000 ft (305 m) upstream and converted to present site and datum, from information by Gulf, Colorado, and Santa Fe Railway Co.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,600 ft<sup>3</sup>/s (300 m<sup>3</sup>/s) Apr. 29, gage height, 17.62 ft (5.371 m), no peak above base of 12,000 ft<sup>3</sup>/s (340 m<sup>3</sup>/s); minimum, 31 ft<sup>3</sup>/s (0.88 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	213	1340	176	176	188	136	253	2980	292	228	96	108
2	145	828	176	178	185	137	198	1600	342	186	85	134
3	119	588	174	181	190	149	164	1140	328	153	96	105
4	108	454	170	183	192	147	139	942	476	130	94	92
5	155	357	168	186	187	139	114	850	296	116	83	87
6	108	295	172	191	182	128	105	766	222	117	72	89
7	97	260	170	188	179	122	98	678	190	120	69	92
8	96	230	168	184	179	121	90	650	174	114	65	90
9	99	206	169	183	182	119	81	588	155	100	62	92
10	123	188	168	182	191	117	72	486	145	101	60	96
11	135	176	175	180	210	115	68	446	132	88	62	94
12	142	166	176	193	207	112	62	461	122	78	66	97
13	138	176	171	211	194	103	59	486	115	76	69	92
14	124	182	179	212	186	92	59	504	107	77	82	90
15	136	194	186	216	182	86	91	956	105	81	75	89
16	315	196	190	216	178	84	3800	2230	105	81	76	88
17	143	196	191	209	170	81	5000	1840	102	80	74	89
18	107	198	198	201	168	78	3960	693	93	83	76	89
19	100	202	197	195	162	72	2310	443	87	79	85	127
20	114	194	193	189	158	64	1840	370	78	70	85	110
21	112	186	190	182	155	59	6190	345	72	64	94	87
22	103	176	186	185	153	55	2950	320	72	66	87	80
23	102	166	184	196	149	50	1580	865	79	74	85	80
24	98	160	182	196	147	44	1990	1360	942	85	87	73
25	98	158	180	196	143	42	2860	643	2210	113	85	64
26	95	156	182	198	139	74	2120	363	794	267	84	58
27	95	149	181	201	139	2150	886	271	580	199	87	53
28	120	147	185	194	136	672	695	239	507	162	103	46
29	1080	151	183	186	---	587	3040	219	416	136	91	39
30	1450	172	180	185	---	529	5590	206	300	120	85	34
31	2540	---	179	190	---	358	---	198	---	115	82	---
TOTAL	8610	8247	5579	5963	4831	6822	46464	24138	9638	3559	2502	2564
MEAN	278	275	180	192	173	220	1549	779	321	115	80.7	85.5
MAX	2540	1340	198	216	210	2150	6190	2980	2210	267	103	134
MIN	95	147	168	176	136	42	59	198	72	64	60	34
AC-FT	17080	16360	11070	11830	9580	13530	92160	47880	19120	7060	4960	5090
CAL YR 1976	TOTAL	66790.6	MEAN 182	MAX 2540	MIN 2.8	AC-FT 132500						
WTR YR 1977	TOTAL	128917.0	MEAN 353	MAX 6190	MIN 34	AC-FT 255700						

COLORADO RIVER BASIN

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08138000 COLORADO RIVER AT WINCHELL, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: November 1967 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 27...	1340	94	1860	7.7	14.5	550	410	120	60	180
JAN 17...	1415	209	1880	7.9	5.0	560	370	130	57	190
FEB 28...	1300	136	1920	7.8	12.0	560	400	120	62	200
APR 11...	1300	69	2370	7.5	19.0	690	530	140	82	240
JUL 05...	1600	110	--	--	--	--	--	--	--	--
AUG 08...	1605	65	1590	7.4	31.5	410	300	88	47	160
SEP 12...	1615	93	1610	7.6	29.0	480	350	100	55	140

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 27...	3.4	7.4	170	0	290	340	.4	15	1100
JAN 17...	3.5	4.5	230	0	250	370	.5	11	1130
FEB 28...	3.7	4.7	184	0	260	460	.4	5.6	1200
APR 11...	4.0	.2	190	0	380	470	.6	3.8	1410
JUL 05...	--	--	--	--	--	--	--	--	--
AUG 08...	3.4	6.0	140	0	220	300	.5	16	907
SEP 12...	2.8	5.3	160	0	220	300	.5	22	922

## COLORADO RIVER BASIN

## 08139000 DEEP CREEK SUBWATERSHED NO. 3 NEAR PLACID, TX

LOCATION.--Lat 31°17'25", long 99°09'22", McCulloch County, Hydrologic Unit 12090106, near right end of dam on tributary to Deep Creek and 2.8 mi (4.5 km) southeast of Placid.

DRAINAGE AREA.--3.42 mi<sup>2</sup> (8.86 km<sup>2</sup>).

PERIOD OF RECORD.--October 1953 to September 1977 (discontinued).

REVISED RECORDS.--WSP 1922: 1954-60.

GAGE.--Water-stage recorder. Datum of gage is 1,500.00 ft (457.200 m) above mean sea level. Prior to Dec. 1, 1953, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period of no gage-height record, which are poor. The pool is formed by an earthfill dam comprised of two sections; the main section is 2,600 ft (792 m) long and the second section is 2,400 ft (732 m) long. An emergency spillway 250 ft (76 m) wide is located at the left end of the main section of dam; crest of the emergency spillway is at gage height 22.0 ft (6.71 m). The dam was completed and storage began in October 1953. The outlet works consist of an uncontrolled 2.5-foot (0.8 m) square concrete drop-inlet structure, gage height at crest, 13.0 ft (3.96 m), connected to a 17-inch (432 mm) concrete outlet pipe. Invert at bottom of outlet pipe is at gage height 5.5 ft (1.68 m). There is also an 8-inch (203 mm) controlled water-supply outlet pipe connected to the drop inlet at a gage height of 5.5 ft (1.68 m). Pool capacity is 886 acre-ft (1.09 hm<sup>3</sup>) at the crest of emergency spillway, 125 acre-ft (1.54 hm<sup>3</sup>) at crest of drop inlet, and 7.1 acre-ft (0.009 hm<sup>3</sup>) at controlled outlet pipe. The area and capacity tables are based on a Soil Conservation Service survey dated Aug. 27, 1960. The dam was built by the Soil Conservation Service for flood control. A recording rain gage is located at station.

AVERAGE INFLOW.--24 years, 389 acre-ft/yr (480,000 m<sup>3</sup>/yr).

AVERAGE OUTFLOW.--24 years, 244 acre-ft/yr (301,000 m<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum inflow, 3,060 ft<sup>3</sup>/s (86.7 m<sup>3</sup>/s), average for 5-minute interval, July 26, 1971, computed from change in pool contents and adjusted for outflow and rainfall on pool surface during time of peak inflow; no inflow most of time each year. Maximum outflow, 30 ft<sup>3</sup>/s (0.85 m<sup>3</sup>/s) May 19, 1955, gage height, 20.79 ft (6.337 m); no outflow most of time each year.

EXTREMES FOR CURRENT YEAR.--Peak inflow above base of 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)
Mar. 27	0015	*122 3.46	Apr. 16	unknown	about 4.25 150

NOTE.--Average for 15-minute interval. Inflow computed and adjusted as explained above.

Minimum discharge, no inflow for many days. Maximum outflow, 1.0 ft<sup>3</sup>/s (0.028 m<sup>3</sup>/s) Apr. 30, gage height, 13.12 ft (3.999 m); no outflow for many days.

## POOL WATER BUDGET, IN ACRE-Feet, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
Inflow 1/	36.8	2.0	5.4	4.2	1.7	51.8	35.5	12.4	2.6	1.2	0.2	0.1
Outflow	0	0	0	0	0	0	6.7	1.8	0	0	0	0
(+)	+30.4	-6.8	-7	-1.1	-6.1	+43.5	+18.6	-14.6	-24.6	-24.2	-16.5	-11.7
(++)	2.61	.70	1.33	1.19	.07	2.32	4.50	.50	.21	.42	0	0
CAL YR 1976: Inflow	119											
WTR YR 1977: Inflow	154											
			Outflow	0	+27.4		++ 18.08					
			Outflow	8.5	+13.8		++ 13.85					

1/ Inflow adjusted for rainfall on pool and pool losses.

+ Change in contents, in acre-feet.

++ Rainfall, in inches.

NOTE.--No gage-height record Apr. 11 to May 26; inflow and outflow estimated.



## 08140600 LAKE CLYDE NEAR CLYDE, TX

LOCATION.--Lat 32°19'05", long 99°28'43", Callahan County, Hydrologic Unit 12090107, at Clyde pump station, 0.6 mi (1.0 km) west of dam on North Prong Pecan Bayou, 2.1 mi (3.4 km) downstream from bridge on Farm Road 604, and 7.0 mi (11.3 km) southeast of Clyde.

DRAINAGE AREA.--37.9 mi<sup>2</sup> (98.2 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1970 to current year.

GAGE.--Nonrecording gage. Datum of gage is at mean sea level.

REMARKS.--The lake is formed by a rolled-fill earthen dam 3,950 ft (1,204 m) long. Appreciable storage began in April 1970, and the dam was completed in May 1970. The emergency spillways are two 200-foot-wide (61 m) cut channels through natural ground located at left end of dam. The service spillway is an uncontrolled 3.5- by 10.5-foot (1.1- by 3.2-meter) reinforced concrete drop inlet that is connected to a 42-inch (1,067-millimeter) concrete outlet pipe. A 14-inch (356-millimeter) controlled drain pipe is connected to the drop inlet. There are four 4.83- by 3.50-foot (1.47- by 1.07-meter) rectangular slots, two on each side, divided by a 10-inch (254-millimeter) concrete web. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	1,888.9	16,530
Crest of spillway.....	1,881.4	10,840
Crest of spillway (invert of drop inlet).....	1,872.0	5,720
Lowest gated outlet (invert).....	1,842.2	60

COOPERATION.--Record of lake elevations and diversions furnished by city of Clyde. Capacity table furnished by the Soil Conservation Service.

EXTREMES (at 0900) FOR PERIOD OF RECORD.--Maximum contents, 6,370 acre-ft (7.85 hm<sup>3</sup>) May 28, 1975, elevation, 1,873.4 ft (571.01 m); minimum, 2,370 acre-ft (2.92 hm<sup>3</sup>) Sept. 15-17, 1974, elevation, 1,862.7 ft (567.75 m).

EXTREMES (at 0900) FOR CURRENT YEAR.--Maximum contents, 3,580 acre-ft (4.41 hm<sup>3</sup>) June 25-27, elevation, 1,866.6 ft (568.94 m); minimum, 2,770 acre-ft (3.42 hm<sup>3</sup>) Sept. 29, 30, elevation, 1,864.1 ft (568.18 m).

Capacity table (elevation, in feet, and total contents, in acre-feet)

1,864.0	2,740
1,865.5	3,200
1,867.0	3,720

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 0900

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3170	3340	3300	3200	3110	3080	3010	3300	3370	3510	3240	2980
2	3170	3340	3300	3200	3110	3040	3010	3340	3340	3510	3270	2980
3	3170	3340	3300	3170	3110	3040	3010	3340	3340	3510	3270	2980
4	3140	3340	3300	3170	3110	3040	3010	3340	3340	3470	3240	2980
5	3140	3340	3300	3170	3110	3040	3010	3340	3300	3470	3240	2950
6	3140	3300	3270	3170	3110	3040	2980	3370	3300	3470	3240	2950
7	3140	3300	3270	3170	3110	3040	2980	3340	3300	3440	3240	2950
8	3140	3300	3270	3170	3110	3010	2980	3340	3300	3440	3200	2950
9	3140	3300	3270	3170	3110	3010	2980	3340	3270	3440	3200	2920
10	3140	3300	3270	3170	3110	3010	2980	3340	3270	3440	3170	2920
11	3140	3300	3270	3170	3110	3010	2950	3400	3270	3440	3170	2920
12	3140	3300	3270	3170	3110	3010	2950	3440	3240	3400	3170	2920
13	3140	3300	3240	3170	3110	2980	2950	3440	3240	3400	3110	2920
14	3140	3340	3240	3170	3110	2980	2950	3440	3240	3370	3110	2920
15	3140	3340	3240	3170	3110	2980	2950	3440	3240	3370	3080	2890
16	3140	3340	3240	3170	3110	2980	2980	3440	3200	3340	3080	2890
17	3140	3340	3240	3170	3110	2980	3040	3440	3200	3340	3080	2890
18	3140	3340	3240	3170	3110	2950	3080	3440	3170	3340	3080	2890
19	3140	3340	3240	3170	3110	2950	3080	3400	3170	3300	3080	2860
20	3140	3300	3240	3140	3080	2950	3110	3400	3170	3300	3080	2860
21	3140	3300	3240	3140	3080	2950	3200	3400	3140	3300	3080	2860
22	3140	3300	3240	3140	3080	2950	3240	3400	3140	3340	3040	2860
23	3140	3300	3240	3140	3080	2920	3240	3400	3110	3340	3040	2830
24	3140	3300	3240	3140	3080	2920	3270	3400	3110	3300	3080	2830
25	3140	3300	3240	3140	3080	2920	3270	3400	3580	3300	3080	2830
26	3140	3300	3200	3140	3080	2920	3270	3400	3580	3300	3040	2800
27	3140	3300	3200	3140	3080	2950	3270	3370	3580	3270	3040	2800
28	3140	3300	3200	3140	3080	3010	3270	3370	3540	3270	3040	2800
29	3170	3300	3200	3140	---	3040	3270	3370	3540	3270	3010	2770
30	3340	3300	3200	3110	---	3040	3270	3370	3540	3240	3010	2770
31	3340	---	3200	3110	---	3040	---	3370	---	3240	3010	---
(+)	1865.9	1865.8	1865.5	1865.2	1865.1	1865.0	1865.7	1866.0	1866.5	1865.6	1864.9	1864.1
(*)	+170	-40	-100	-90	-30	-40	+230	+100	+170	-300	-230	-240
(++)	22	21	21	23	19	24	26	29	45	40	40	41
MAX	3340	3340	3300	3200	3110	3080	3270	3440	3580	3510	3270	2980
MIN	3140	3300	3200	3110	3080	2920	2950	3300	3110	3240	3010	2770

CAL YR 1976 MAX 4580 MIN 3140 \* -1380 ++ 322  
WTR YR 1977 MAX 3580 MIN 2770 \* -400 ++ 351

+ Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

++ Diversions, in acre-feet, for municipal use.

COLORADO RIVER BASIN  
08140600 LAKE CLYDE NEAR CLYDE, TX--Continued  
WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 27...	1525	1120	7.6	13.0	230	110	60	19	130
DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 27...	3.7	8.0	138	0	88	220	.4	6.3	600

COLORADO RIVER BASIN

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08140700 PECAN BAYOU NEAR CROSS CUT, TX

LOCATION.--Lat 31°58'21", long 99°07'48", Brown County, Hydrologic Unit 12090107, on right bank at downstream side of bridge on State Highway 279, 1.2 mi (1.9 km) downstream from Turkey Creek, and 4.2 mi (6.8 km) south of Cross Cut.

DRAINAGE AREA.--532 mi<sup>2</sup> (1,378 km<sup>2</sup>).

PERIOD OF RECORD.--April 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,453.35 ft (442.981 m) above mean sea level.

REMARKS.--Records good. Several small diversions above station. Flow is affected at times by discharge from flood-detention pools of 32 floodwater-retarding structures with combined detention capacity of 39,200 acre-ft (48.3 hm<sup>3</sup>). These structures control runoff from 200 mi<sup>2</sup> (518 km<sup>2</sup>) in the Turkey Creek and upper Pecan Bayou drainage basins. National Weather Service gage-height telemeter and rain gage at station.

AVERAGE DISCHARGE.--9 years, 34.2 ft<sup>3</sup>/s (0.969 m<sup>3</sup>/s), 24,780 acre-ft/yr (30.6 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,330 ft<sup>3</sup>/s (208 m<sup>3</sup>/s) Oct. 19, 1971, gage height, 19.68 ft (5.998 m); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1908 reached a stage of 26.5 ft (8.08 m) and was exceeded by a flood in 1900, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 940 ft<sup>3</sup>/s (26.6 m<sup>3</sup>/s) Apr. 21, gage height, 5.06 ft (1.542 m), no peak above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	35	1.4	.34	1.1	.24	9.8	169	.02	2.0	.00	.00
2	.00	21	1.3	.24	1.1	.24	7.7	71	.01	.62	.00	.00
3	.00	13	.84	.24	1.1	.31	5.7	42	.00	.13	.00	.00
4	.00	8.2	.83	.34	1.1	.35	4.8	29	.00	.04	.00	.00
5	.00	3.9	.87	.46	1.1	.32	3.0	21	.00	.01	.00	8.2
6	.00	3.3	1.4	.35	1.1	.24	2.2	18	.00	.00	.00	29
7	.00	4.4	.94	.35	1.0	.22	2.0	15	.00	.00	.00	1.1
8	.00	4.4	.62	.35	.83	.16	2.2	13	.00	.00	.00	.12
9	.00	3.7	.73	.47	.83	.16	2.0	12	.00	.00	.00	.01
10	.00	2.5	.83	.36	.83	.16	1.9	119	.00	.00	.00	.00
11	.00	2.1	1.1	.40	1.1	.28	1.6	55	.00	.00	.00	.00
12	.00	1.3	1.4	.82	1.4	.24	1.4	34	.00	.00	.00	.00
13	.00	2.0	1.4	1.5	1.4	.22	1.3	21	.00	.00	.00	.00
14	.00	2.0	1.4	1.7	1.2	.15	1.3	16	.00	.00	.00	.00
15	25	2.0	1.4	1.6	1.1	.12	6.0	12	.00	.00	.00	.00
16	43	2.0	1.4	1.4	1.1	.12	227	8.3	.00	.00	.00	.00
17	3.9	1.7	.87	.91	.90	.12	340	6.4	.00	.00	.00	.00
18	.35	1.6	.83	.84	.80	.12	207	4.8	.00	.00	.00	.00
19	.08	1.3	.83	.78	.62	.11	94	3.7	.00	.00	.00	.00
20	.08	1.2	.83	.57	.54	.08	71	3.0	.00	.00	.00	.00
21	.03	1.3	.83	.62	.50	.07	771	5.1	.00	.00	.00	.00
22	.02	1.3	.83	.84	.42	.03	381	3.9	.00	.00	.00	.00
23	.01	1.1	.83	1.1	.35	.02	140	2.8	.00	.00	.00	.00
24	.01	1.6	.83	1.4	.35	.01	89	1.6	.00	.00	.00	.00
25	.01	1.7	.83	1.4	.28	.01	63	.83	120	.00	.00	.00
26	.00	2.1	.58	1.4	.16	1.1	47	.46	98	.00	.00	.00
27	.10	2.0	.47	1.1	.14	286	34	.27	42	.00	.00	.00
28	.35	1.8	.47	.83	.16	134	25	.15	19	.00	.00	.00
29	246	1.5	.47	.83	---	46	21	.11	11	.00	.00	.00
30	53	1.4	.43	.92	---	22	163	.07	5.1	.00	.00	.00
31	79	---	.35	1.1	---	13	---	.04	---	.00	.00	---
TOTAL	450.94	132.4	28.14	25.56	22.61	506.20	2725.9	688.53	295.13	2.80	.00	38.43
MEAN	14.5	4.41	.91	.82	.81	16.3	90.9	22.2	9.84	.090	.000	1.28
MAX	246	35	1.4	1.7	1.4	286	771	169	120	2.0	.00	29
MIN	.00	1.1	.35	.24	.14	.01	1.3	.04	.00	.00	.00	.00
AC-FT	894	263	56	51	45	1000	5410	1370	585	5.6	.00	76
CAL YR 1976	TOTAL	779.67	MEAN	2.13	MAX	246	MIN	.00	AC-FT	1550		
WTR YR 1977	TOTAL	4916.64	MEAN	13.5	MAX	771	MIN	.00	AC-FT	9750		

## COLORADO RIVER BASIN

08140800 JIM NED CREEK NEAR COLEMAN, TX

LOCATION.--Lat 31°58'59", long 99°24'52", Coleman County, Hydrologic Unit 12090108, on right bank 77 ft (23 m) downstream from centerline of U.S. Highway 283, 1.4 mi (2.3 km) downstream from Turtle Bayou, 7.4 mi (11.9 km) downstream from Lake Coleman, and 10.8 mi (17.4 km) north of Coleman.

DRAINAGE AREA.--333 mi<sup>2</sup> (862 km<sup>2</sup>), of which 299 mi<sup>2</sup> (774 km<sup>2</sup>) is above Lake Coleman.

PERIOD OF RECORD.--October 1961 to September 1964 (miscellaneous measurements only), March 1965 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,592.31 ft (485.336 m) above mean sea level.

REMARKS.--Records good. Since March 1966 when deliberate impoundment began, flow has been largely controlled by Lake Coleman, capacity, 40,000 acre-ft (49.3 hm<sup>3</sup>) at service spillway; elevation, 1,717.5 ft (523.49 m). During year, the city of Coleman diverted 942 acre-ft (1.16 hm<sup>3</sup>) from Lake Coleman for municipal use.

AVERAGE DISCHARGE.--12 years, 23.2 ft<sup>3</sup>/s (0.657 m<sup>3</sup>/s), 16,810 acre-ft/yr (20.7 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,020 ft<sup>3</sup>/s (142 m<sup>3</sup>/s) May 6, 1969, gage height, 9.08 ft (2.768 m); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 89 ft<sup>3</sup>/s (2.52 m<sup>3</sup>/s) Apr. 17, gage height, 1.87 ft (0.570 m); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	15	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	8.4	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	3.8	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	1.4	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.34	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.08	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	11	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	14	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	5.4	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.73	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	1.5	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	72	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	29	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	16	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	12	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	50	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	26	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	13	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	8.5	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	5.4	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	2.9	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	1.6	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.73	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.62	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	13	.00	.00	.00	.00	.00
TOTAL	.00	.00	.00	.00	.00	.00	252.25	60.40	.00	.00	.00	.00
MEAN	.000	.000	.000	.000	.000	.000	8.41	1.95	.000	.000	.000	.000
MAX	.00	.00	.00	.00	.00	.00	72	15	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	500	120	.00	.00	.00	.00
CAL YR 1976	TOTAL	0.00	MEAN .000	MAX .00	MIN .00	AC-FT .00						
WTR YR 1977	TOTAL	312.65	MEAN .86	MAX 72	MIN .00	AC-FT 620						

## 08141000 HORDS CREEK LAKE NEAR VALERA, TX

LOCATION.--Lat 31°49'58", long 99°33'38", Coleman County, Hydrologic Unit 12090108, at outlet-works structure near right end of dam on Hords Creek, 5.6 mi (9.0 km) north of Valera, and 8.8 mi (14.2 km) west of Coleman.

DRAINAGE AREA.--48 mi<sup>2</sup> (124 km<sup>2</sup>), approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1948 to current year. Prior to October 1970, published as Hords Creek Reservoir.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level.

REMARKS.--The lake is formed by a rolled earthfill dam 6,800 ft (2,070 m) long, including spillway. The deliberate impoundment of water began Apr. 7, 1948, and the dam was completed in June 1948. The emergency spillway is an excavated channel through natural ground, 500 ft (150 m) wide, located about 600 ft (180 m) from the right end of dam. The service spillway consists of three concrete conduits; two controlled by slide gates 5.0 by 6.0 ft (1.5 by 1.8 m), and the third an uncontrolled ogee spillway 4.0 ft (1.2 m) wide and 19.5 ft (5.9 m) high. The lake is operated for flood control and municipal water supply for the city of Coleman. The capacity table of August 1974 is based on a sedimentation survey made in 1968. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	1,939.0	-
Design flood.....	1,933.6	-
Crest of spillway.....	1,920.0	24,730
Crest of spillway (top of conservation pool).....	1,900.0	8,110
Lowest gated outlet (invert).....	1,856.0	3

COOPERATION.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 12,790 acre-ft (15.8 hm<sup>3</sup>) May 1, 1956, elevation, 1,906.86 ft (581.211 m); minimum since first appreciable storage in June 1951, 2,910 acre-ft (3.59 hm<sup>3</sup>) Sept. 19, 1964, elevation, 1,883.26 ft (574.018 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 5,120 acre-ft (6.31 hm<sup>3</sup>) May 9, elevation, 1,892.97 ft (576.977 m); minimum, 3,860 acre-ft (4.76 hm<sup>3</sup>) Sept. 30, elevation, 1,888.96 ft (575.755 m).

## Capacity table (elevation, in feet, and total contents, in acre-feet)

1,888.0	3,600	1,892.0	4,790
1,890.0	4,160	1,894.0	5,490

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4870	4830	4690	4570	4490	4380	4390	5070	5020	4710	4420	4110
2	4870	4830	4690	4570	4490	4370	4380	5080	5010	4690	4410	4100
3	4860	4820	4690	4570	4490	4370	4370	5090	5000	4680	4410	4090
4	4860	4820	4680	4560	4490	4370	4360	5090	4990	4660	4390	4090
5	4850	4810	4680	4560	4480	4360	4360	5100	4970	4650	4380	4070
6	4830	4800	4670	4550	4480	4350	4350	5110	4960	4640	4360	4060
7	4840	4800	4670	4550	4470	4350	4340	5110	4950	4630	4350	4060
8	4840	4800	4660	4540	4470	4340	4340	5110	4940	4620	4340	4050
9	4830	4790	4660	4530	4470	4330	4330	5120	4930	4610	4320	4040
10	4820	4790	4650	4530	4470	4330	4320	5110	4910	4600	4310	4040
11	4810	4780	4650	4530	4470	4320	4320	5110	4900	4590	4300	4030
12	4800	4770	4650	4540	4470	4320	4320	5110	4890	4570	4290	4020
13	4790	4770	4650	4540	4460	4320	4310	5110	4880	4560	4280	4010
14	4790	4780	4650	4540	4460	4310	4320	5100	4870	4540	4280	4000
15	4790	4770	4640	4530	4460	4310	4360	5100	4860	4530	4260	3990
16	4780	4760	4640	4540	4450	4300	4540	5100	4850	4520	4250	3980
17	4760	4760	4640	4530	4450	4300	4600	5090	4840	4510	4240	3980
18	4750	4760	4630	4530	4440	4290	4610	5090	4820	4500	4230	3960
19	4740	4760	4630	4520	4430	4280	4630	5090	4810	4480	4220	3960
20	4730	4750	4630	4520	4430	4280	4700	5090	4790	4470	4220	3950
21	4730	4750	4620	4520	4430	4270	4900	5090	4780	4530	4220	3940
22	4720	4740	4620	4530	4430	4260	4910	5090	4770	4520	4210	3930
23	4710	4730	4620	4520	4410	4260	4920	5080	4770	4500	4200	3920
24	4700	4740	4610	4520	4410	4250	4930	5070	4780	4500	4190	3920
25	4700	4730	4610	4510	4400	4250	4930	5060	4770	4490	4190	3900
26	4690	4730	4610	4510	4400	4390	4940	5060	4760	4480	4170	3890
27	4730	4720	4600	4510	4390	4410	4940	5050	4750	4470	4160	3880
28	4770	4710	4590	4500	4380	4410	4940	5040	4740	4470	4150	3870
29	4840	4710	4590	4500	---	4400	5000	5040	4740	4460	4140	3860
30	4840	4700	4580	4500	---	4390	5060	5030	4720	4450	4130	3860
31	4840	---	4570	4500	---	4390	---	5020	---	4430	4120	---
(+)	1892.15	1891.74	1891.35	1891.11	1890.75	1890.77	1892.80	1892.70	1891.81	1890.91	1889.87	1888.96
(*)	-40	-140	-130	-70	-120	+10	+670	-40	-300	-290	-310	-260
(††)	51	31	34	26	19	11	15	23	43	50	48	43
MAX	4870	4830	4690	4570	4490	4410	5060	5120	5020	4710	4420	4110
MIN	4690	4700	4570	4500	4380	4250	4310	5020	4720	4430	4120	3860

CAL YR 1976..... \* -1580

WTR YR 1977..... \* -1020

†† 458

†† 394

MAX 6150

MAX 5120

MIN 4570

MIN 3860

† Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

†† Diversions, in acre-feet, for municipal use by city of Coleman.



## COLORADO RIVER BASIN

08141000 HORDS CREEK LAKE NEAR VALERA, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)
NOV 03...	0820	1210	7.9	13.0	320	190	70	35	110
AUG 18...	1200	1310	7.5	29.0	330	200	67	39	130
DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
NOV 03...	2.7	5.4	160	0	52	260	.4	6.9	619
AUG 18...	3.1	6.4	150	0	63	290	.3	7.3	677

## COLORADO RIVER BASIN

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## 08141500 HORDS CREEK NEAR VALERA, TX

LOCATION.--Lat 31°50'03", long 99°32'04", Coleman County, Hydrologic Unit 12090108, on left bank 2,500 ft (762 m) downstream from Farm Road 503, 1.6 mi (2.6 km) downstream from Hords Creek Dam, 5.7 mi (9.2 km) north of Valera, 7.0 mi (11.3 km) west of Coleman, and 21.8 mi (35.1 km) upstream from mouth.

DRAINAGE AREA.--53 mi<sup>2</sup> (137 km<sup>2</sup>), approximately, of which 48 mi<sup>2</sup> (124 km<sup>2</sup>) is above Hords Creek Dam.

PERIOD OF RECORD.--April 1947 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,819.88 ft (554.699 m) above mean sea level (Corps of Engineers bench mark).

REMARKS.--Records good. Flow regulated by Hords Creek Lake (station 08141000).

AVERAGE DISCHARGE.--30 years, 1.79 ft<sup>3</sup>/s (0.0507 m<sup>3</sup>/s), 1,300 acre-ft/yr (1.60 hm<sup>3</sup>/yr),

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,860 ft<sup>3</sup>/s (109 m<sup>3</sup>/s) Apr. 30, 1956, gage height, 14.73 ft (4.490 m), from rating curve extended above 1,900 ft<sup>3</sup>/s (53.8 m<sup>3</sup>/s); no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1900, 23.0 ft (7.01 m) July 3, 1932, from information by local residents (discharge not determined). Flood in July or September 1900 reached a stage 3.7 ft (1.13 m) higher than that of July 1932, 12 mi (19 km) downstream from station, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 42 ft<sup>3</sup>/s (1.19 m<sup>3</sup>/s) Apr. 16, gage height, 2.93 ft (0.893 m); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.07	.84	.33	.13	.24	.10	.33	1.6	.10	.00	.00	.00
2	.06	.74	.33	.19	.21	.10	.33	1.2	.09	.00	.00	.00
3	.06	.60	.31	.20	.20	.12	.33	1.1	.08	.00	.00	.00
4	.07	.51	.30	.19	.19	.10	.28	1.0	.07	.00	.00	.00
5	.19	.45	.29	.18	.17	.10	.27	.89	.06	.00	.00	.00
6	.12	.43	.36	.16	.17	.10	.24	.99	.06	.00	.00	.00
7	.39	.41	.28	.17	.17	.10	.22	.91	.05	.00	.00	.00
8	.47	.33	.27	.17	.17	.10	.23	.76	.04	.00	.00	.00
9	.18	.33	.22	.18	.17	.10	.24	.68	.03	.00	.00	.00
10	.14	.38	.14	.17	.19	.11	.23	.68	.02	.00	.00	.00
11	.11	.34	.13	.20	.27	.11	.22	.66	.01	.00	.00	.00
12	.10	.35	.14	.40	.22	.10	.21	.56	.01	.00	.00	.00
13	.11	.74	.12	.60	.18	.11	.22	.49	.00	.00	.00	.00
14	.10	.81	.12	.32	.16	.14	.21	.44	.00	.00	.00	.00
15	.11	.79	.15	.27	.16	.13	1.9	.38	.00	.00	.00	.00
16	.11	.71	.14	.22	.14	.12	7.3	.33	.00	.00	.00	.00
17	.12	.57	.13	.20	.14	.12	6.3	.32	.00	.00	.00	.00
18	.11	.55	.14	.21	.14	.10	2.5	.29	.00	.00	.00	.00
19	.10	.53	.14	.18	.14	.11	2.1	.28	.00	.00	.00	.00
20	.10	.55	.12	.20	.13	.12	2.6	.28	.00	.00	.00	.00
21	.10	.51	.12	.20	.12	.12	6.2	.36	.00	.01	.00	.00
22	.09	.45	.16	.20	.14	.12	2.1	.26	.00	.01	.00	.00
23	.10	.43	.16	.40	.13	.12	1.6	.22	.00	.00	.00	.00
24	.10	.48	.14	.27	.12	.13	1.4	.19	.00	.00	.00	.00
25	.10	.49	.15	.21	.12	.14	1.3	.16	.00	.00	.00	.00
26	.10	.43	.14	.20	.11	.48	1.2	.16	.00	.00	.00	.00
27	1.1	.34	.14	.18	.11	2.6	1.2	.14	.00	.00	.00	.00
28	1.2	.29	.13	.16	.10	.68	1.0	.13	.00	.00	.00	.00
29	7.2	.27	.12	.15	---	.47	1.9	.11	.00	.00	.00	.00
30	1.7	.30	.12	.19	---	.39	3.2	.11	.00	.00	.00	.00
31	1.1	---	.12	.24	---	.33	---	.10	---	.00	.00	---
TOTAL	15.71	14.95	5.66	6.94	4.51	7.77	47.36	15.78	.62	.02	.00	.00
MEAN	.51	.50	.18	.22	.16	.25	1.58	.51	.021	.001	.000	.000
MAX	7.2	.84	.36	.60	.27	2.6	7.3	1.6	.10	.01	.00	.00
MIN	.06	.27	.12	.13	.10	.10	.21	.10	.00	.00	.00	.00
AC-FT	31	30	11	14	8.9	15	94	31	1.2	.04	.00	.00
CAL YR 1976	TOTAL	92.07	MEAN .25	MAX 11	MIN .00	AC-FT 183						
WTR YR 1977	TOTAL	119.32	MEAN .33	MAX 7.3	MIN .00	AC-FT 237						

## COLORADO RIVER BASIN

## 08142500 BROWN COUNTY WATER IMPROVEMENT DISTRICT NO. 1 CANAL NEAR BROWNWOOD, TX

LOCATION.--Lat 31°49'43", long 98°59'53", Brown County, Hydrologic Unit 12090107, on right bank 100 ft (30 m) upstream from bridge on Farm Road 2125, 6,000 ft (1,830 m) downstream from Brownwood Dam, and 7 mi (11 km) north of Brownwood.

PERIOD OF RECORD.--March 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,403.96 ft (427.927 m) above mean sea level.

REMARKS.--Records good. Water is released into the canal from Lake Brownwood (station 08143000) at the dam on Pecan Bayou. Diversions begin Apr. 9, 1939. A small amount of water is diverted from the canal upstream from the gage for domestic use. Water for irrigation has been diverted from the canal above gage since 1971. Records furnished by Brown County Water Improvement District No. 1 show that during the current year 1,560 acre-ft (1.92 hm<sup>3</sup>) was diverted from canal above gage for irrigation, and the total flow of canal passing gage, 7,280 acre-ft (8.98 hm<sup>3</sup>) was used for municipal and industrial supply and 2,840 acre-ft (3.50 hm<sup>3</sup>) was used for irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--27 years, 26.4 ft<sup>3</sup>/s (0.748 m<sup>3</sup>/s), 19,130 acre-ft/yr (23.6 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 77 ft<sup>3</sup>/s (2.18 m<sup>3</sup>/s) July 17, 1957; no flow Jan. 27, 1977.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	18	15	8.8	9.1	9.8	4.6	20	31	35	42	34
2	28	18	15	10	9.1	11	5.1	14	33	34	41	33
3	15	18	15	10	8.9	14	5.1	11	37	30	41	34
4	17	18	15	10	9.0	14	10	11	32	29	43	33
5	19	18	15	10	9.2	14	15	15	26	32	45	34
6	19	18	14	10	9.4	14	15	23	32	36	43	34
7	19	18	14	10	9.6	14	13	13	40	40	42	16
8	19	19	14	10	10	13	12	12	41	43	44	.04
9	19	19	14	10	10	11	14	12	46	44	44	.71
10	19	20	13	9.9	5.5	12	14	13	50	43	44	1.3
11	19	20	13	10	9.3	11	14	13	52	44	43	1.3
12	17	20	13	11	9.7	10	13	13	52	44	43	1.7
13	13	20	13	11	10	10	13	13	52	45	44	9.1
14	13	20	14	11	9.9	13	13	13	52	47	42	23
15	14	19	14	11	9.0	16	13	13	51	47	41	20
16	14	19	14	11	9.4	18	13	13	48	48	40	22
17	14	19	14	11	10	22	13	13	37	47	39	22
18	15	19	14	11	9.8	21	12	13	36	47	35	23
19	15	19	13	11	9.4	20	13	13	38	47	34	23
20	15	18	12	11	9.7	20	13	13	38	47	32	25
21	15	18	12	12	11	19	12	13	45	47	28	24
22	16	18	12	11	13	27	11	11	47	47	25	26
23	16	17	11	11	11	27	9.4	1.6	47	47	19	27
24	16	18	11	13	9.9	27	8.8	2.1	37	47	19	27
25	16	18	11	13	10	27	7.5	26	27	48	19	28
26	17	18	11	3.7	9.7	26	.87	26	24	48	19	28
27	17	17	11	.00	9.2	13	1.4	27	29	48	19	29
28	17	17	10	3.4	9.3	7.9	9.7	26	32	48	18	29
29	18	16	11	9.3	---	6.4	27	21	31	48	22	29
30	18	16	10	9.1	---	5.7	23	21	34	46	27	29
31	18	---	10	9.1	---	5.1	---	25	---	42	32	---
TOTAL	532	550	398	302.30	269.1	478.9	348.47	473.7	1177	1345	1069	666.15
MEAN	17.2	18.3	12.8	9.75	9.61	15.4	11.6	15.3	39.2	43.4	34.5	22.2
MAX	28	20	15	13	13	27	27	27	52	48	45	34
MIN	13	16	10	.00	5.5	5.1	.87	1.6	24	29	18	.04
AC-FT	1060	1090	789	600	534	950	691	940	2330	2670	2120	1320
CAL YR 1976	TOTAL	10084.30	MEAN	27.6	MAX	63	MIN	1.6	AC-FT	20000		
WTR YR 1977	TOTAL	7609.62	MEAN	20.8	MAX	52	MIN	.00	AC-FT	15090		

## 08143000 LAKE BROWNWOOD NEAR BROWNWOOD, TX

LOCATION.--Lat 31°50'13", long 99°00'13", Brown County, Hydrologic Unit 12090107, at outlet structure for irrigation canal just upstream from right end of dam on Pecan Bayou, 0.2 mi (0.4 km) downstream from Jim Ned Creek, 8 mi (13 km) north of Brownwood, and 57.1 mi (91.9 km) upstream from mouth.

DRAINAGE AREA.--1,535 mi<sup>2</sup> (3,976 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1933 to June 1934, April 1935 to September 1940, November 1944 to current year. Prior to October 1970, published as Brownwood Reservoir.

REVISED RECORDS.--WSP 1212: 1948-50.

GAGE.--Nonrecording gage read once daily. Datum of gage is 0.50 ft (0.152 m) below mean sea level. Prior to November 1944, nonrecording gages or water-stage recorder at various sites at dam at same datum.

REMARKS.--The lake is formed by a rolled earthfill dam, 1,580 ft (482 m) long. The dam was completed in 1933 and deliberate impoundment began in July 1933. Capacity table is based on 1959 survey. The uncontrolled spillway is a broad-crested weir 479 ft (146 m) long located 800 ft (240 m) to the left of dam. The controlled spillway consists of two 12-foot (4-meter) horseshoe-shaped concrete conduits. Water is released into Brown County canal through a 5-foot (2-meter) circular conduit that is controlled by a slide gate in a service structure located near the right end of dam. Water is used for irrigation and for municipal and industrial supply by the city of Brownwood (see station 08142500). Flow is affected at times by discharge from flood-detention pools of 59 floodwater-retarding structures with combined capacity of 73,310 acre-ft (90.4 km<sup>3</sup>). These structures control runoff from 353 mi<sup>2</sup> (914 km<sup>2</sup>) in the Jim Ned Creek and Pecan Bayou drainage basins. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam.....	1,450.0	-
Crest of spillway.....	1,425.1	143,400
Lowest gated outlet to irrigation canal (invert).....	1,406.0	46,510
Lowest gated outlet (invert).....	1,330.0	-

COOPERATION.--Record of daily gage heights furnished by Brown County Water Improvement District No. 1. Capacity table furnished by Corps of Engineers and Soil Conservation Service.

EXTREMES (at 1800) FOR PERIOD OF RECORD.--Maximum contents, 192,300 acre-ft (237 km<sup>3</sup>) May 2, 1956, gage height, 1,431.4 ft (436.29 m); minimum, 11,900 acre-ft (14.7 km<sup>3</sup>) July 15, 1934, gage height, 1,389.5 ft (423.52 m).

EXTREMES (at 1800) FOR CURRENT YEAR.--Maximum contents observed, 112,100 acre-ft (138 km<sup>3</sup>) May 10-18, gage height, 1,420.4 ft (432.94 m); minimum, 84,730 acre-ft (104 km<sup>3</sup>), Mar. 23-25, gage height, 1,415.5 ft (431.44 m).

Capacity table (gage height, in feet, and total contents, in acre-feet)

1,415.0	82,270
1,418.0	97,850
1,421.0	115,700

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 1800

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	89830	91910	90350	88790	88270	86730	95670	111500	110300	103700	97300	90870
2	89830	91910	90350	88790	88270	86730	95670	111500	110300	103700	96750	90870
3	89310	91910	90350	88790	88270	86730	95670	111500	109700	103700	96750	90350
4	89310	91910	90350	88790	88270	86730	95670	111500	109700	103700	96210	90350
5	89310	91910	90350	88790	87750	86730	95670	111500	109700	103100	96210	90350
6	89310	91910	90350	88270	87750	86730	95670	111500	109700	103100	95670	90350
7	89310	91910	90350	88270	87750	86730	95130	111500	109100	102500	95670	90350
8	89310	91390	89830	88270	87750	86230	95130	111500	109100	102500	95130	89830
9	88790	91390	89830	88270	87750	86230	95130	111500	109100	102500	95130	89830
10	88790	91390	89830	88270	87750	86230	95130	112100	108500	101900	94590	89830
11	88790	91390	89830	88270	87750	86230	94590	112100	108500	101900	94590	89310
12	88790	91390	89830	88270	87750	86230	94590	112100	107900	101300	94050	89310
13	88790	91390	89830	88270	87750	86230	94590	112100	107900	101300	94050	89310
14	88270	91390	89830	88790	87750	85730	94590	112100	107300	100700	93510	88790
15	88270	91390	89830	88790	87750	85730	95130	112100	107300	100700	93510	88790
16	88270	91390	89830	88790	87750	85730	95670	112100	106700	100100	93510	88270
17	88270	91390	89830	88270	87750	85730	98970	112100	106700	100100	92970	88270
18	88270	91390	89830	88270	87750	85730	99530	112100	106700	99530	92970	88270
19	88270	91390	89830	88270	87750	85730	100100	111500	106100	99530	92970	87750
20	88270	91390	89830	88270	87750	85730	100700	111500	106100	99530	92430	87750
21	88270	91390	89830	88270	87230	85230	103700	111500	105500	98970	92430	87230
22	87750	90870	89830	88270	87230	85230	107900	111500	105500	98970	92430	87230
23	87750	90870	89830	88270	87230	84730	108500	111500	104900	98970	92430	87230
24	87750	90870	89310	88270	87230	84730	109100	111500	104900	98970	91910	86730
25	87750	90870	89310	88270	87230	84730	109100	111500	104900	98410	91910	86730
26	87750	90870	89310	88270	87230	85730	109100	110900	104900	98410	91910	86730
27	87230	90870	89310	88270	86730	90350	109100	110900	104900	97850	91390	86230
28	87230	90350	89310	88270	86730	95130	109100	110900	104300	97850	91390	86230
29	89830	90350	89310	88270	---	95670	109100	110300	104300	97850	91390	86230
30	91390	90350	88790	88270	---	95670	109700	110300	104300	97300	91390	86230
31	91910	---	88790	88270	---	95670	---	110300	---	97300	90870	---
(+)	1416.9	1416.6	1416.3	1416.2	1415.9	1417.6	1420.0	1420.1	1419.1	1417.9	1416.7	1415.8
(+)	+2080	-1560	-1560	-1560	-1540	+8940	+14030	+600	-6000	-7000	-6430	-4640
MAX	91910	91910	90350	88790	88270	95670	109700	112100	110300	103700	97300	90870
MIN	87230	90350	88790	88270	86730	84730	94590	110300	104300	97300	90870	86230

CAL YR 1976 MAX 116900 MIN 87230 \* -28110  
WTR YR 1977 MAX 112100 MIN 84730 \* -3600

+ Gage height, in feet, at end of month.  
\* Change in contents, in acre-feet.

## COLORADO RIVER BASIN

08143000 LAKE BROWNWOOD NEAR BROWNWOOD, TX--Continued

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 28...	1610	785	8.1	15.0	220	98	60	16	74
	SODIUM AD-SORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 28...	2.2	7.6	143	0	55	140	.4	8.2	432



## COLORADO RIVER BASIN

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## 08143500 PECAN BAYOU AT BROWNWOOD, TX

LOCATION.--Lat 31°43'54", long 98°58'25", Brown County, Hydrologic Unit 12090107, on right bank at Brownwood, 502 ft (153 m) upstream from city dam, 6.3 mi (10.1 km) downstream from Salt Creek, 10 mi (16 km) downstream from Lake Brownwood, and 47.5 mi (76.4 km) upstream from mouth.

DRAINAGE AREA.--1,614 mi<sup>2</sup> (4,180 km<sup>2</sup>).

PERIOD OF RECORD.--May 1917 to June 1918, October 1923 to current year.

REVISED RECORDS.--WSP 1312: 1928. WSP 1512: 1924(M), 1926-27, 1928(M), 1930-32, 1935(M), 1936, 1941.

GAGE.--Water-stage recorder. Datum of gage is 1,318.58 ft (401.903 m) above mean sea level. See WSP 1922 for history of changes prior to Apr. 2, 1962.

REMARKS.--Records good. Flow regulated by Lake Brownwood (station 08143000). Brown County Water Improvement District No. 1 canal (station 08142500) diverts water from Lake Brownwood 10 mi (16 km) upstream. At end of year, flow from 20.8 mi<sup>2</sup> (53.9 km<sup>2</sup>) above this station and below Lake Brownwood was partly controlled by nine floodwater-retarding structures with a combined detention capacity of 4,720 acre-ft (5.82 hm<sup>3</sup>). National Weather Service gage-height telemeter at station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--7 years (water years 1925-28, 1930-32) prior to completion of Lake Brownwood, 251 ft<sup>3</sup>/s (7.108 m<sup>3</sup>/s), 181,800 acre-ft/yr (224 hm<sup>3</sup>/yr); 45 years (water years 1933-77) regulated, 125 ft<sup>3</sup>/s (3.540 m<sup>3</sup>/s), 90,560 acre-ft/yr (112 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,600 ft<sup>3</sup>/s (895 m<sup>3</sup>/s) Oct. 14, 1930, gage height, 16.92 ft (5.157 m); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage, 21.7 ft (6.61 m) in September 1900, from information by Gulf, Colorado, and Santa Fe Railway Co. Flood of July 3, 1932, probably the greatest, reached a discharge of about 235,000 ft<sup>3</sup>/s (6,660 m<sup>3</sup>/s) as it entered Lake Brownwood (computed from rate of change of contents in lake; data furnished by engineers of Brown County Water Improvement District No. 1).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 134 ft<sup>3</sup>/s (3.79 m<sup>3</sup>/s) Mar. 28, gage height, 1.29 ft (0.393 m); maximum gage height, 1.33 ft (0.405 m) Oct. 29; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	7.1	2.8	2.7	3.9	2.1	18	16	1.5	1.5	.14	.00
2	1.2	6.0	2.9	2.8	3.7	2.7	13	11	1.3	1.4	.12	.00
3	.78	5.8	2.9	3.0	3.9	5.0	10	9.5	1.9	1.1	.09	.00
4	.81	4.7	3.1	3.4	3.5	6.5	8.6	8.3	2.0	.65	.05	.00
5	1.3	3.8	3.0	3.1	2.5	5.6	6.9	7.5	2.0	.38	.03	.00
6	1.5	3.5	4.3	3.1	2.1	4.9	5.6	7.7	2.0	.42	.00	.00
7	2.5	3.2	4.0	3.1	2.9	4.6	5.4	7.5	1.7	.83	.00	.00
8	4.8	3.0	3.4	3.3	3.5	4.9	6.3	7.1	1.1	1.1	.00	.00
9	5.0	3.0	3.1	3.6	2.5	5.2	5.1	6.4	.49	1.2	.00	.00
10	4.3	2.9	3.2	3.0	2.5	5.5	5.0	5.8	.31	.69	.00	.00
11	3.5	2.8	4.0	2.9	3.3	6.2	4.8	5.4	.20	.30	.00	.00
12	3.3	2.2	4.2	3.9	2.7	5.3	5.0	5.3	.28	.16	.03	.00
13	3.3	3.7	3.7	5.3	2.5	4.8	5.5	4.9	.82	.09	.26	.00
14	3.3	4.4	3.7	5.1	2.7	4.6	6.4	4.8	1.5	.05	.51	.00
15	3.9	4.4	4.4	4.3	2.3	4.4	8.9	4.9	1.8	.06	.60	.00
16	3.9	4.4	4.6	3.9	2.3	4.2	77	4.8	1.6	.06	.68	.00
17	3.7	4.0	4.6	3.4	2.5	4.8	74	4.8	1.7	.04	.38	.00
18	3.3	3.9	4.3	3.4	2.9	5.5	43	4.8	1.6	.01	.28	.00
19	4.1	3.5	4.2	3.0	2.9	5.3	22	4.6	1.3	.00	.20	.00
20	4.6	3.5	4.7	2.9	2.5	3.1	20	4.8	.89	.01	.17	.00
21	4.1	3.2	3.9	2.7	3.1	1.8	55	5.3	.43	.02	.17	.00
22	3.9	3.0	3.7	3.1	2.7	1.3	36	4.6	.25	.12	.18	.00
23	4.1	2.9	3.8	4.2	2.5	1.0	16	4.4	.19	.14	.16	.00
24	4.3	3.3	3.9	3.7	2.0	.87	15	4.1	.70	.17	.15	.00
25	3.5	3.9	3.8	2.9	1.8	.84	13	3.7	2.8	.21	.10	.00
26	2.3	5.1	3.4	2.7	1.6	3.9	9.9	3.5	3.0	.18	.05	.00
27	2.1	4.3	3.5	2.5	2.1	99	8.4	3.2	2.4	.11	.02	.00
28	2.9	3.1	3.9	2.7	2.0	106	6.5	3.2	2.0	.35	.00	.00
29	69	2.7	3.4	2.9	---	65	6.8	3.7	1.7	.51	.00	.00
30	26	2.7	3.5	3.1	---	38	41	3.0	1.6	.38	.00	.00
31	9.4	---	3.1	4.2	---	23	---	2.1	---	.26	.00	---
TOTAL	192.89	114.0	115.0	103.9	75.4	435.91	558.1	176.7	41.06	12.50	4.37	.00
MEAN	6.22	3.80	3.71	3.35	2.69	14.1	18.6	5.70	1.37	.40	.14	.000
MAX	69	7.1	4.7	5.3	3.9	106	77	16	3.0	1.5	.68	.00
MIN	.78	2.2	2.8	2.5	1.6	.84	4.8	2.1	.19	.00	.00	.00
AC-FT	383	226	228	206	150	865	1110	350	81	25	8.7	.00
CAL YR 1976	TOTAL	1558.85	MEAN	4.26	MAX	112	MIN	.23	AC-FT	3090		
WTR YR 1977	TOTAL	1829.83	MEAN	5.01	MAX	106	MIN	.00	AC-FT	3630		

## COLORADO RIVER BASIN

08143600 PECAN BAYOU NEAR MULLIN, TX

LOCATION.--Lat 31°31'02", long 98°44'25", Mills County, Hydrologic Unit 12090107, on right bank 44 ft (13 m) downstream from bridge on Farm Road 573, 0.6 mi (1.0 km) downstream from Blanket Creek, 5.5 mi (8.8 km) southwest of Mullin, and 10 mi (16 km) upstream from Colorado River.

DRAINAGE AREA.--2,034 mi<sup>2</sup> (5,268 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,202.93 ft (366.653 m) above mean sea level.

REMARKS.--Water-discharge records good. Flow is affected by Lake Brownwood 47 mi (76 km) upstream (see station 08143000). At end of year, flow from 139 mi<sup>2</sup> (360 km<sup>2</sup>) above this station and below Lake Brownwood was partly controlled by 38 floodwater-retarding structures with a combined detention capacity of 30,690 acre-ft (37.8 hm<sup>3</sup>) below the flood-spillway crests.

AVERAGE DISCHARGE.--10 years, 153 ft<sup>3</sup>/s (4.333 m<sup>3</sup>/s), 110,800 acre-ft/yr (137 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,700 ft<sup>3</sup>/s (388 m<sup>3</sup>/s) Jan. 23, 1968, gage height, 29.26 ft (8.918 m); no flow June 29 to Aug. 5, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,700 ft<sup>3</sup>/s (190 m<sup>3</sup>/s) Mar. 27, gage height, 18.60 ft (5.669 m); minimum, 0.16 ft<sup>3</sup>/s (0.005 m<sup>3</sup>/s) Sept. 28, 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	46	24	23	22	13	88	638	38	7.7	7.6	2.3
2	11	33	23	23	24	13	63	302	30	6.7	7.0	2.6
3	11	28	22	23	25	38	53	212	23	6.7	6.0	2.5
4	10	25	22	23	25	38	42	171	20	6.2	5.1	1.9
5	15	23	22	23	26	33	33	152	22	6.2	4.0	1.5
6	19	22	29	24	25	28	32	138	22	6.1	2.6	1.2
7	17	21	30	24	24	24	31	122	17	4.4	1.7	1.2
8	12	20	30	24	22	23	28	107	15	2.7	1.3	1.1
9	14	19	26	24	22	22	26	97	14	2.6	1.1	.87
10	16	19	24	24	26	21	26	88	13	10	.93	2.2
11	13	21	26	23	26	23	26	84	12	2.1	.91	5.4
12	13	22	32	25	32	23	26	71	14	1.5	.99	4.6
13	12	24	37	32	30	24	25	66	76	1.5	.88	3.1
14	12	26	30	46	25	21	29	60	47	1.4	1.4	2.7
15	11	40	30	39	24	19	98	55	26	1.7	40	1.8
16	11	36	33	31	22	18	2120	52	23	2.2	14	1.3
17	13	30	30	27	21	18	1240	52	19	1.6	6.3	1.1
18	14	29	29	25	20	15	464	51	16	1.1	5.4	.75
19	13	28	28	24	18	14	261	52	12	.98	7.2	.69
20	12	26	28	23	20	14	350	51	9.4	1.1	7.0	.64
21	13	25	28	23	16	15	649	52	11	1.4	4.9	.64
22	12	25	28	22	16	15	395	49	12	2.5	6.2	.64
23	14	25	28	23	15	13	215	48	11	3.6	11	.64
24	13	23	26	26	14	12	154	43	10	1.6	9.5	.64
25	14	23	26	29	13	11	126	40	13	1.1	5.6	.64
26	13	23	26	28	13	13	107	34	32	1.2	4.1	.51
27	12	23	26	26	14	4520	92	28	12	1.9	2.1	.31
28	19	25	24	24	14	1590	76	25	8.8	1.6	1.7	.22
29	122	24	24	23	---	499	1930	24	8.3	2.4	1.6	.21
30	348	24	23	22	---	235	1640	22	8.3	18	1.3	.39
31	97	---	23	22	---	143	---	22	---	11	1.5	---
TOTAL	937	778	837	798	596	7508	10445	3008	594.8	120.78	170.91	44.29
MEAN	30.2	25.9	27.0	25.7	21.3	242	348	97.0	19.8	3.90	5.51	1.48
MAX	348	46	37	46	32	4520	2120	638	76	18	40	5.4
MIN	10	19	22	22	13	11	25	22	8.3	.98	.88	.21
AC-FT	1860	1540	1660	1580	1180	14890	20720	5970	1180	240	339	88
CAL YR 1976	TOTAL	9791.30	MEAN	26.8	MAX	467	MIN	1.6	AC-FT	19420		
WTR YR 1977	TOTAL	25837.78	MEAN	70.8	MAX	4520	MIN	.21	AC-FT	51250		

08143600 PECAN BAYOU NEAR MULLIN, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1967 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to current year.

WATER TEMPERATURES: October 1967 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (1967-70, 1972-77): Maximum daily, 2,020 micromhos Aug. 13, 1977; minimum daily, 203 micromhos Sept. 18, 1974.

WATER TEMPERATURES (1967-70, 1972-75): Maximum daily, 32.0°C on several days during summer months; minimum daily, 1.0°C Jan. 15, 1975.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,020 micromhos Aug. 13; minimum daily, 300 micromhos Apr. 30.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 01...	1945	11	420	7.8	23.0	110	21	33	6.7	35
NOV 01...	2130	40	498	8.4	11.5	150	39	43	9.3	37
JAN 17...	1500	26	1390	7.7	5.0	360	150	93	30	150
FEB 28...	1550	14	1550	8.0	--	370	150	96	31	170
MAR 28...	1130	10	336	7.6	16.0	170	19	55	7.2	15
APR 11...	1625	26	769	7.9	20.0	260	58	64	25	54
JUN 01...	1640	35	1070	8.1	27.0	280	24	72	24	91
JUL 06...	0820	6.4	1680	7.7	28.0	390	170	110	28	220
SEP 13...	0915	3.0	1560	7.8	26.0	360	140	100	26	170

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 01...	1.5	5.2	108	0	21	58	.2	6.9	219
NOV 01...	1.3	6.7	122	4	43	62	.2	7.6	273
JAN 17...	3.5	9.5	248	0	120	260	.3	3.7	789
FEB 28...	3.9	11	270	0	130	290	.4	.5	862
MAR 28...	.5	5.1	180	0	17	23	.2	8.4	220
APR 11...	1.5	5.4	250	0	58	94	.3	7.3	431
JUN 01...	2.4	4.9	310	0	73	120	.4	7.9	546
JUL 06...	4.8	10	270	0	130	360	.5	2.9	995
SEP 13...	3.9	13	260	0	130	290	.5	9.1	867

## COLORADO RIVER BASIN

08143600 PECAN BAYOU NEAR MULLIN, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	937	875	480	1220	130	328	64	163	260
NOV. 1976.....	778	1020	560	1180	160	326	77	162	280
DEC. 1976.....	837	1330	740	1670	230	512	110	239	320
JAN. 1977.....	798	1330	740	1600	230	491	110	228	330
FEB. 1977.....	596	1430	800	1280	260	418	110	184	340
MAR. 1977.....	7508	424	240	4820	55	1110	23	468	120
APR. 1977.....	10445	466	250	7170	55	1550	27	754	140
MAY 1977.....	3008	671	370	2990	80	652	46	371	200
JUNE 1977.....	594.8	1120	620	995	170	266	87	139	290
JULY 1977.....	120.78	1590	890	290	310	102	130	43	360
AUG. 1977.....	170.91	1560	870	403	300	140	130	59	360
SEPT 1977.....	44.29	1620	910	108	320	38	130	16	370
TOTAL .....	25837.76	**	**	23700	**	5930	**	2830	**
WTD.AVG. ....	70.79	616	340	**	86	**	41	**	180

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	416	498	1270	1330	1260	1570	510	345	1080	1440	1280	1650
2	388	540	1300	1320	1290	1540	535	470	1190	1510	1320	1610
3	450	574	1320	1340	1360	1400	557	568	1140	1540	1360	1630
4	518	595	1350	1350	1370	1030	590	618	1160	1590	1470	1640
5	568	631	1330	1270	1420	1160	619	642	1170	1640	1500	1630
6	599	651	1310	1100	1410	1200	650	675	1190	1680	1560	1620
7	628	670	1350	1250	1400	1250	684	709	1220	1690	1640	1630
8	770	700	1390	1380	1400	1290	710	745	1210	1700	1700	1620
9	900	718	1380	1400	1380	1290	727	770	1230	1640	1750	1650
10	1050	736	1400	1420	1380	1210	748	791	1240	1230	1800	1620
11	1200	756	1370	1400	1390	1240	769	808	1250	1110	1820	1500
12	1330	807	1310	1370	1420	1260	815	797	1080	1270	1840	1530
13	1290	840	1260	1340	1450	1290	857	840	730	1370	2020	1550
14	1240	890	1310	1390	1490	1330	895	868	888	1510	1960	1590
15	1180	1090	1330	1380	1520	1370	787	890	1020	1580	1120	1620
16	1290	1230	1350	1390	1500	1400	520	909	1090	1590	1550	1650
17	1370	1260	1330	1380	1510	1420	485	931	1140	1630	1990	1680
18	1450	1300	1330	1370	1520	1380	490	945	1210	1660	2010	1690
19	1490	1340	1350	1390	1500	1380	509	959	1260	1680	1970	1700
20	1500	1340	1340	1390	1490	1410	536	975	1300	1710	1950	1720
21	1510	1360	1340	1380	1480	1450	498	959	1460	1750	1930	1750
22	1520	1350	1350	1350	1460	1480	567	965	1490	1790	1870	1770
23	1490	1390	1360	1370	1450	1510	558	970	1490	1850	1720	1790
24	1460	1390	1420	1380	1440	1470	584	973	1520	1870	1780	1800
25	1430	1420	1370	1400	1430	1450	615	975	1480	1880	1760	1810
26	1420	1370	1310	1410	1450	1450	651	1050	1090	1700	1770	1810
27	1440	1300	1240	1200	1500	356	663	1090	1210	1860	1760	1820
28	1420	1380	1260	1150	1550	337	691	1220	1270	1900	1750	1830
29	1190	1290	1270	1170	---	375	354	1220	1340	1920	1740	1840
30	595	1210	1300	1200	---	420	300	1230	1370	1720	1730	1870
31	550	---	1310	1240	---	455	---	1240	---	1530	1730	---
MEAN	1090	1020	1330	1330	1440	1200	616	876	1220	1630	1710	1690

COLORADO RIVER BASIN

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08143600 PECAN BAYOU NEAR MULLIN, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23.0	11.5	6.0	---	---	12.0	18.0	---	27.0	---	30.0	---
2	23.0	---	6.5	---	6.0	15.0	---	---	29.0	---	---	---
3	---	13.0	7.0	5.5	6.5	13.0	18.5	24.0	26.0	---	28.0	---
4	22.0	14.0	8.0	7.0	5.0	14.0	---	24.0	---	---	28.5	---
5	21.5	13.5	---	---	7.0	13.0	19.0	23.0	---	---	---	---
6	20.5	14.0	7.0	6.0	---	---	---	---	---	---	---	29.0
7	18.0	---	7.0	---	---	---	19.5	22.0	28.5	29.5	---	28.0
8	---	---	6.5	7.0	8.0	14.0	---	24.0	28.5	31.5	---	28.0
9	---	15.0	---	---	10.0	14.0	20.0	---	29.0	29.5	30.0	28.0
10	---	16.0	8.0	5.0	10.0	17.0	---	23.0	---	---	31.0	27.0
11	---	13.0	---	4.0	15.0	---	---	23.0	30.0	30.0	---	---
12	19.0	11.0	---	---	---	14.0	20.0	25.0	28.5	30.0	28.5	26.0
13	19.0	---	8.0	4.0	---	---	19.0	---	26.0	27.0	---	27.0
14	19.0	---	9.0	5.0	---	---	20.0	23.0	28.0	31.5	---	27.0
15	19.0	7.0	---	6.0	11.0	---	17.0	---	28.0	30.0	31.0	25.0
16	17.0	6.5	8.0	---	13.0	18.0	16.0	22.0	---	28.5	31.0	27.0
17	---	---	9.0	5.0	---	19.0	---	23.0	---	---	---	---
18	---	---	11.0	4.0	12.0	20.0	---	---	---	30.0	28.0	---
19	15.0	10.0	10.5	4.5	12.0	17.0	22.0	23.0	30.0	30.0	---	27.0
20	13.0	10.5	---	5.0	---	---	21.0	23.0	29.0	---	27.0	---
21	---	---	7.0	6.0	12.0	16.0	20.0	23.0	29.0	---	27.0	---
22	16.0	10.0	---	6.5	---	---	20.0	---	28.5	32.0	30.0	---
23	16.5	10.5	7.0	---	14.5	15.5	20.0	---	24.0	30.0	30.0	26.0
24	---	10.0	8.0	---	---	16.0	20.5	---	---	33.0	31.0	---
25	---	10.5	---	---	16.0	16.0	22.0	24.0	---	30.0	---	28.0
26	15.5	14.0	---	9.5	13.0	18.0	21.0	25.0	---	32.0	30.0	30.0
27	---	10.0	8.0	9.0	---	7.0	20.0	26.0	---	34.0	---	28.0
28	13.0	---	---	8.0	13.0	18.0	23.0	27.5	---	28.0	---	28.0
29	11.0	---	---	5.0	---	18.0	19.0	---	---	30.0	---	26.5
30	12.0	7.0	8.5	---	---	---	---	29.0	---	32.0	29.0	26.5
31	---	---	---	6.0	---	16.0	---	---	---	---	28.0	---
MEAN	17.5	11.5	8.0	6.0	11.0	15.5	20.0	24.0	28.0	30.5	29.5	27.5



## COLORADO RIVER BASIN

08144000 NOYES CANAL AT MENARD, TX

LOCATION.--Lat 30°54'57", long 99°47'02", Menard County, Hydrologic Unit 12090109, on right bank at intersection of Canal and Gay Streets in Menard and 4.7 mi (7.6 km) downstream from headgates.

PERIOD OF RECORD.--March 1924 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,878.06 ft (572.433 m) above mean sea level. Prior to July 23, 1940, nonrecording gage at site 2,000 ft (610 m) upstream at datum 4.99 ft (1.521 m) higher.

REMARKS.--Records good. Discharge represents flow diverted from San Saba River; local runoff between diversion point and gage is excluded. Canal diverts water from right bank of San Saba River 4.7 mi (7.6 km) upstream from Menard for irrigation near Menard. First diversion was about 1890. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--53 years (water years 1925-77), 13.2 ft<sup>3</sup>/s (0.374 m<sup>3</sup>/s), 9,560 acre-ft/yr (11.8 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge (exclusive of times canal was submerged by floodwaters of San Saba River or when flow was affected by local runoff between point of diversion and station), 43 ft<sup>3</sup>/s (1.22 m<sup>3</sup>/s) Apr. 29, 30, 1928; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	5.9	9.2	11	8.2	18	12	.00	20	.00	.00	17
2	17	5.4	9.1	11	8.0	16	12	.00	21	.00	.00	17
3	17	4.8	9.1	12	7.8	17	11	.00	21	.00	.00	18
4	21	3.9	9.0	12	7.7	16	11	.00	22	.00	.00	18
5	23	2.7	8.9	11	7.2	15	11	.00	18	.00	.00	19
6	22	1.7	7.9	11	6.6	15	11	.00	4.0	.00	.00	19
7	20	4.0	8.4	11	6.5	15	11	.00	.01	.00	.00	20
8	18	12	8.4	11	6.8	15	11	.00	.00	.00	.00	20
9	17	9.8	8.4	11	6.7	15	11	.00	.00	.00	.00	20
10	17	8.5	8.4	11	6.4	14	11	.00	.00	.00	.00	21
11	17	8.2	8.7	10	6.2	14	11	.00	.00	.00	.00	21
12	17	7.1	8.8	11	5.9	14	10	.00	.00	.00	.00	21
13	16	5.7	9.4	11	6.0	13	9.3	.00	.00	.00	.00	21
14	16	6.3	8.6	10	7.3	13	9.3	.00	.00	.00	.00	14
15	16	4.8	8.5	9.9	7.2	13	13	.00	.00	.00	.00	21
16	17	3.1	8.5	9.7	7.0	13	18	.00	.00	.00	.00	21
17	20	1.8	8.5	9.7	6.9	18	13	.00	.00	.00	.00	21
18	20	1.7	8.4	9.7	7.0	18	.57	.00	.00	.00	.00	21
19	20	2.5	8.4	9.7	9.4	18	.00	.00	.00	.00	.00	21
20	19	8.0	8.2	9.5	18	17	.00	.00	.00	.00	.00	22
21	19	9.2	8.4	9.3	17	18	.00	.00	.00	.00	.00	22
22	19	9.2	8.3	9.7	18	18	.00	.00	.00	.00	.00	22
23	19	9.3	8.3	9.1	16	18	.00	.00	.00	.00	.00	22
24	19	9.3	8.3	8.7	11	18	.00	.00	.00	.00	.00	22
25	18	9.3	9.8	8.5	9.7	18	.00	.00	.00	.00	.00	22
26	11	9.3	12	8.2	8.8	19	.00	12	.00	.00	.00	22
27	1.8	9.3	12	8.2	10	18	.00	14	.00	.00	6.4	22
28	3.3	9.3	11	7.9	18	14	.00	14	.00	.00	12	22
29	10	9.2	11	7.8	---	13	.00	15	.00	.00	14	23
30	16	9.1	11	8.1	---	12	.00	19	.00	.00	15	23
31	1.1	---	12	8.1	---	12	---	20	---	.00	16	---
TOTAL	505.2	200.4	284.9	305.8	261.3	485	196.17	94.00	106.01	.00	63.40	615
MEAN	16.3	6.68	9.19	9.86	9.33	15.6	6.54	3.03	3.53	.000	2.05	20.5
MAX	23	12	12	12	18	19	18	20	22	.00	16	23
MIN	1.1	1.7	7.9	7.8	5.9	12	.00	.00	.00	.00	.00	14
AC-FT	1000	397	565	607	518	962	389	186	210	.00	126	1220
CAL YR 1976	TOTAL	5676.04	MEAN	15.5	MAX	24	MIN	.00	AC-FT	11260		
WTR YR 1977	TOTAL	3117.18	MEAN	8.54	MAX	23	MIN	.00	AC-FT	6180		

## 08144500 SAN SABA RIVER AT MENARD, TX

LOCATION.--Lat 30°55'08", Long 99°47'07", Menard County, Hydrologic Unit 12090109, on downstream side of bridge on U.S. Highway 83 in Menard, 1.1 mi (1.8 km) downstream from Las Moras Creek, 1.9 mi (3.1 km) upstream from Volkmann Draw, and 110.4 mi (177.6 km) upstream from mouth.

DRAINAGE AREA.--1,151 mi<sup>2</sup> (2,981 km<sup>2</sup>).

PERIOD OF RECORD.--September 1915 to current year.

REVISED RECORDS.--WSP 568: Drainage area. WSP 1512: 1918-20, 1922-25, 1926(M), 1927-32, 1934(M), 1936, 1938(M).

GAGE.--Water-stage recorder. Datum of gage is 1,863.05 ft (567.858 m) above mean sea level. Sept. 14, 1915, to Mar. 12, 1924, nonrecording gage at site 635 ft (194 m) downstream at datum 2.20 ft (0.671 m) lower. Mar. 13, 1924, to Feb. 21, 1939, nonrecording gage at site 1,000 ft (305 m) upstream at datum 2.00 ft (0.610 m) higher. Feb. 22, 1939, to Jan. 25, 1940, nonrecording gage at present site and datum. Jan. 26, 1940, to Sept. 19, 1957, water-stage recorder at site 240 ft (73 m) to right at present datum. Feb. 8, 1962, to Jan. 22, 1963, nonrecording gage at site 600 ft (180 m) downstream at present datum.

REMARKS.--Records good. Since about 1890, low flow during irrigation season regulated by diversions to Noyes Canal 4.5 mi (7.2 km) upstream and diversions by pumping at several locations upstream. Records of the Texas Water Rights Commission show permits have been granted to irrigate 3,338 acres (1,400 km<sup>2</sup>) above station. See record of Noyes Canal on preceding page. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--62 years, 64.9 ft<sup>3</sup>/s (1.838 m<sup>3</sup>/s), 47,020 acre-ft/yr (58.0 km<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 130,000 ft<sup>3</sup>/s (3,680 m<sup>3</sup>/s) July 23, 1938, gage height, 22.2 ft (6.77 m), present site and datum, from floodmark, from rating curve extended above 56,000 ft<sup>3</sup>/s (1,590 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow at times as result of upstream diversion to Noyes Canal (station 08144000).

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1880, 23.3 ft (7.10 m) June 6, 1899, present site and datum, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 670 ft<sup>3</sup>/s (19.0 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 5	0930	3,290	93.2	8.84	2.694	Apr. 15	2200	*18,900	535	14.74	4.493
Oct. 29	2230	4,000	113	9.30	2.835	June 24	1115	3,340	94.6	8.88	2.707
Mar. 27	1100	2,060	58.3	7.89	2.405						

Minimum discharge, 22 ft<sup>3</sup>/s (0.62 m<sup>3</sup>/s) Aug. 4, 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	154	65	59	70	55	69	116	89	83	74	34
2	42	109	62	62	69	57	64	112	89	83	74	34
3	41	94	64	66	69	77	61	109	88	82	72	34
4	49	87	63	66	71	73	57	109	87	82	41	34
5	1380	84	65	65	70	64	56	110	87	82	54	33
6	366	83	68	66	69	62	56	114	93	82	61	34
7	137	80	66	66	68	61	55	112	96	82	60	35
8	97	65	66	66	73	61	55	110	95	81	54	36
9	71	67	66	65	72	61	55	109	95	80	59	37
10	60	66	66	64	70	62	54	108	94	79	61	36
11	53	66	69	64	73	62	53	126	93	79	65	39
12	49	65	68	67	71	60	55	117	93	78	60	42
13	48	75	68	70	69	60	57	110	93	77	62	42
14	47	75	77	70	68	60	59	108	93	76	69	39
15	48	74	73	68	67	60	3550	108	92	76	69	39
16	48	75	68	66	69	58	3840	108	91	76	65	38
17	45	78	68	66	69	54	1750	108	91	76	68	38
18	43	78	69	66	68	54	382	107	90	76	67	38
19	44	77	69	65	67	52	193	106	90	76	74	38
20	45	68	67	66	55	50	153	106	89	76	71	39
21	44	64	66	66	57	51	138	111	89	75	68	38
22	44	62	66	70	57	51	128	107	89	75	67	36
23	45	63	66	75	56	51	122	104	91	75	66	35
24	46	65	67	71	59	52	121	102	688	75	73	36
25	46	66	68	68	62	54	119	102	108	70	72	37
26	51	68	66	68	64	60	117	93	91	73	67	37
27	67	65	67	68	64	793	115	92	86	73	37	36
28	101	62	66	66	56	168	116	92	85	73	34	35
29	1310	63	65	64	---	105	115	91	84	76	34	35
30	1420	64	74	67	---	82	119	89	84	77	34	35
31	297	---	70	70	---	75	---	90	---	75	34	---
TOTAL	6225	2262	2088	2066	1852	2745	11884	3286	3323	2399	1866	1099
MEAN	201	75.4	67.4	66.6	66.1	88.5	396	106	111	77.4	60.2	36.6
MAX	1420	154	77	75	73	793	3840	126	688	83	74	42
MIN	41	62	62	59	55	50	53	89	84	70	34	33
AC-FT	12350	4490	4140	4100	3670	5440	23570	6520	6590	4760	3700	2180
CAL YR 1976	TOTAL	27619	MEAN	75.5	MAX	3180	MIN	22	AC-FT	54780		
WTR YR 1977	TOTAL	41095	MEAN	113	MAX	3840	MIN	33	AC-FT	81510		

## COLORADO RIVER BASIN

08144800 BRADY CREEK NEAR EDEN, TX

LOCATION.--Lat 31°11'05", long 99°50'29", Concho County, Hydrologic Unit 12090110, on right bank at upstream side of bridge on U.S. Highway 83, 0.8 mi (1.3 km) downstream from Fitzgerald Creek, 2.2 mi (3.5 km) south of Eden, 2.4 mi (3.9 km) upstream from Hardin Branch, and 69.3 mi (111.5 km) upstream from mouth.

DRAINAGE AREA.--97 mi<sup>2</sup> (251 km<sup>2</sup>).

PERIOD OF RECORD.--April 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,000.99 ft (609.902 m) above mean sea level.

REMARKS.--Records good. Flow is affected at times by discharge from the flood-detention pools of five floodwater-retarding structures with combined detention capacity of 22,190 acre-ft (27.4 hm<sup>3</sup>). These structures control runoff from 65.0 mi<sup>2</sup> (168.4 km<sup>2</sup>) above this station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--15 years, 1.17 ft<sup>3</sup>/s (0.0331 m<sup>3</sup>/s), 848 acre-ft/yr (1.05 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,110 ft<sup>3</sup>/s (145 m<sup>3</sup>/s) Apr. 28, 1966, gage height, 7.08 ft (2.158 m); no flow for many days most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1884, 15.8 ft (4.82 m) in July 1938, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,720 ft<sup>3</sup>/s (105 m<sup>3</sup>/s) June 24, gage height, 6.45 ft (1.966 m); minimum, 0.57 ft<sup>3</sup>/s (0.016 m<sup>3</sup>/s) Apr. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.79	2.1	1.5	1.3	1.3	1.1	.82	1.7	1.7	1.3	1.7	1.6
2	.79	1.8	1.5	1.3	1.5	1.3	.77	1.6	1.7	1.5	1.7	1.5
3	.79	1.7	1.5	1.3	2.0	1.2	.78	1.6	1.6	1.5	1.7	1.5
4	1.2	1.6	1.3	1.3	1.3	.94	.64	1.6	1.6	1.6	1.7	1.5
5	2.3	1.6	1.5	1.5	1.2	1.0	.64	1.8	1.5	1.5	1.6	1.5
6	1.3	1.7	1.5	1.5	1.2	1.1	.76	2.0	1.6	1.3	1.6	1.5
7	1.2	1.7	1.3	1.5	1.3	.97	.77	1.6	1.6	1.3	1.6	1.6
8	1.6	1.7	1.3	1.5	1.7	1.1	.76	1.6	1.5	1.3	1.6	1.6
9	1.1	1.7	1.3	1.5	1.4	1.1	.78	1.7	1.5	1.3	1.6	1.5
10	1.1	1.6	1.3	1.5	1.3	1.1	.83	1.7	1.5	1.3	1.6	1.3
11	.97	1.7	1.3	1.6	1.3	1.2	.78	2.8	1.4	1.3	1.5	1.3
12	.97	1.8	1.5	2.1	1.2	1.0	.83	1.7	1.5	1.3	1.6	1.1
13	1.1	2.1	1.5	2.1	1.1	1.1	.93	1.6	1.7	1.1	2.1	1.1
14	1.1	1.9	1.7	1.6	1.1	1.0	1.1	1.6	1.5	1.1	2.0	1.1
15	1.0	1.9	1.5	2.0	1.1	1.0	3.9	1.7	1.5	1.1	1.6	1.1
16	.79	1.8	1.4	1.8	1.1	.97	13	1.9	1.5	1.1	1.5	.93
17	.79	1.6	1.3	1.7	1.1	.98	9.0	1.9	1.3	1.1	1.5	.97
18	.85	1.6	1.5	1.5	1.1	.89	2.0	2.1	1.3	1.1	1.5	.97
19	.98	1.9	1.5	1.3	1.2	.90	1.5	2.2	1.3	1.1	1.5	1.1
20	.97	1.7	1.4	1.3	1.2	.86	2.6	2.0	1.2	1.1	1.5	1.1
21	.97	1.6	1.3	1.3	1.2	.92	8.1	2.2	1.1	1.1	1.3	1.1
22	.97	1.5	1.3	1.6	1.1	.87	1.7	1.7	1.1	1.2	1.3	.98
23	1.0	1.5	1.3	1.8	1.1	.84	1.4	1.6	1.2	1.3	1.4	.97
24	1.1	1.5	1.5	1.5	.94	.91	1.3	1.6	485	1.3	2.6	.97
25	.97	1.5	1.5	1.3	1.1	.92	1.3	1.6	18	1.3	1.9	.96
26	.97	1.7	1.5	1.3	1.2	1.3	1.3	1.7	2.9	1.3	1.7	.97
27	1.9	1.6	1.5	1.3	1.1	4.1	1.3	1.7	1.6	1.3	1.6	.97
28	3.7	1.5	1.4	1.2	1.1	1.1	1.4	1.7	1.2	1.7	1.7	.95
29	9.4	1.4	1.3	1.2	---	.85	1.5	1.7	.97	2.9	1.6	.79
30	3.7	1.5	1.5	1.5	---	.77	1.9	1.6	1.1	2.5	1.6	.87
31	2.2	---	1.4	1.6	---	.79	---	1.7	---	1.7	1.6	---
TOTAL	48.57	50.5	44.1	46.8	34.54	34.18	64.39	55.2	544.17	42.9	51.0	35.40
MEAN	1.57	1.68	1.42	1.51	1.23	1.10	2.15	1.78	18.1	1.38	1.65	1.18
MAX	9.4	2.1	1.7	2.1	2.0	4.1	13	2.8	485	2.9	2.6	1.6
MIN	.79	1.4	1.3	1.2	.94	.77	.64	1.6	.97	1.1	1.3	.79
AC-FT	96	100	87	93	69	68	128	109	1080	85	101	70
CAL YR 1976	TOTAL	481.96	MEAN	1.32	MAX	65	MIN	.05	AC-FT	956		
WTR YR 1977	TOTAL	1051.75	MEAN	2.88	MAX	485	MIN	.64	AC-FT	2090		

## 08144900 BRADY CREEK RESERVOIR NEAR BRADY, TX

LOCATION.--Lat 31°08'17", long 99°23'07", McCulloch County, Hydrologic Unit 12090110, at mouth of Bear Creek on Brady Creek, 280 ft (85 m) upstream from Farm Road 3022 over Brady Creek Dam, 3.0 mi (4.8 km) west of Brady, and 34.1 mi (54.9 km) upstream from mouth.

DRAINAGE AREA.--513 mi<sup>2</sup> (1,329 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level.

REMARKS.--The reservoir is formed by a compacted earthfill dam 8,400 ft (2,560 m) long. The dam was completed and storage began in May 1963. The dam was built by the city of Brady in cooperation with the Soil Conservation Service and the Farmers Home Administration for flood control, municipal, and industrial water supply. The spillway is a cut channel through natural ground 1,000 ft (305 m) wide located at right end of dam. The top of conservation pool is an uncontrolled concrete drop-inlet structure that discharges through a 7.0- by 7.0-foot (2.1- by 2.1-meter) concrete box conduit and is designed to discharge 4,000 ft<sup>3</sup>/s (113 m<sup>3</sup>/s) at a 19.4-foot (5.9-meter) head. The gated outlet is a 36-inch (914-millimeter) pipe that extends through the embankment and is equipped with three sluice gates for controlled releases downstream. Flow into reservoir is affected at times by discharge from the flood-detention pools of 35 floodwater-retarding structures with combined detention capacity of 82,180 acre-ft (101 km<sup>3</sup>). These structures were built during the period February 1955 to July 1962 and control runoff from 263 mi<sup>2</sup> (681 km<sup>2</sup>) in the Brady Creek watershed above this station. Capacity curve is based on Geological Survey topographic map (1960 edition) and was not adjusted for borrow. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	1,783.0	-
Crest of spillway.....	1,762.4	90,310
Crest of spillway (top of conservation pool).....	1,743.0 <sup>1</sup>	30,430
Lowest gated outlet (invert).....	1,712.0	1,320

COOPERATION.--Records furnished by city of Brady show no water diverted during year for municipal or industrial use. Capacity curve furnished by the city of Brady.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 40,880 acre-ft (50.4 km<sup>3</sup>) Sept. 24, 1971, elevation, 1,747.70 ft (532.699 m); minimum since first appreciable storage, 1,030 acre-ft (1.27 km<sup>3</sup>) Sept. 18, 1964, elevation, 1,710.4 ft (521.33 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 29,120 acre-ft (35.9 km<sup>3</sup>) July 1, 2, elevation, 1,742.34 ft (531.065 m); minimum, 24,590 acre-ft (30.3 km<sup>3</sup>) Sept. 30, elevation, 1,739.91 ft (530.325 m).

Capacity table (elevation, in feet, and total contents, in acre-feet)

1,739.0	23,020
1,741.0	26,550
1,743.0	30,430

CONTENTS, IN ACRE-Feet, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25450	26220	26240	26410	26840	26330	26310	28220	28030	29120	27390	25610
2	25430	26220	26240	26440	26840	26420	26260	28220	28010	29120	27330	25570
3	25410	26220	26240	26460	26850	26440	26220	28240	27980	29100	27250	25570
4	25540	26210	26240	26460	26870	26420	26100	28260	27960	29100	27160	25540
5	25500	26220	26260	26460	26870	26410	26060	28300	27920	29060	27060	25500
6	25460	26240	26260	26480	26870	26410	26040	28280	27880	29040	26970	25460
7	25520	26240	26240	26480	26870	26390	26010	28240	27840	29020	26890	25430
8	25460	26240	26240	26500	26890	26390	26010	28220	27820	28980	26780	25410
9	25450	26240	26260	26480	26910	26350	25990	28180	27770	28960	26700	25370
10	25430	26240	26280	26460	26930	26310	25950	28180	27730	28950	26610	25370
11	25410	26240	26310	26440	26970	26260	25920	28150	27690	28890	26530	25340
12	25390	26260	26310	26550	26970	26210	25920	28130	27650	28750	26500	25280
13	25390	26240	26390	26590	26970	26130	25920	28130	27630	28690	26460	25230
14	25370	26240	26420	26610	26970	26100	26030	28110	27600	28610	26420	25190
15	25430	26240	26440	26610	26950	26060	26220	28110	27560	28550	26350	25160
16	25370	26260	26460	26630	26930	26010	26440	28130	27520	28450	26280	25100
17	25340	26240	26460	26630	26820	25990	26720	28130	27410	28360	26210	25070
18	25320	26240	26480	26610	26760	25930	26840	28130	27290	28300	26130	25030
19	25300	26240	26500	26610	26630	25860	27080	28130	27200	28240	26080	25010
20	25280	26240	26480	26630	26510	25790	27420	28300	27080	28180	26040	24980
21	25250	26240	26480	26630	26460	25740	28030	28300	26970	28110	26030	24940
22	25250	26220	26480	26700	26460	25660	28180	28300	26870	28050	25990	24880
23	25260	26240	26460	26720	26440	25590	28220	28300	26870	27980	25970	24850
24	25280	26240	26480	26740	26410	25550	28240	28280	27980	27900	25950	24810
25	25250	26240	26480	26740	26410	25550	28240	28260	28590	27790	25920	24790
26	25230	26240	26480	26760	26370	25920	28260	28240	28770	27710	25830	24760
27	25260	26240	26480	26780	26370	26390	28240	28180	28890	27630	25770	24720
28	25280	26240	26460	26760	26350	26440	28220	28130	29000	27710	25750	24670
29	25280	26240	26460	26740	---	26460	28200	28070	29040	27650	25720	24640
30	25500	26240	26460	26820	---	26410	28260	28030	29080	27580	25680	24590
31	26240	---	26420	26820	---	26350	---	28010	---	27500	25660	---
(+)	1740.83	1740.83	1740.93	1741.14	1740.89	1740.89	1741.90	1741.77	1742.32	1741.50	1740.51	1739.91
(*)	+780	0	+180	+400	-470	0	+1910	-250	+1070	-1580	-1840	-1070
MAX	26240	26260	26500	26820	26970	26460	28260	28300	29080	29120	27390	25610
MIN	25230	26210	26240	26410	26350	25550	25920	28010	26870	27500	25660	24590

CAL YR 1976 MAX 27060 MIN 24790 \* -640  
WTR YR 1977 MAX 29120 MIN 24590 \* -870

+ Elevation, in feet, at end of month.  
\* Change in contents, in acre-feet.

## COLORADO RIVER BASIN

08144900 BRADY CREEK RESERVOIR NEAR BRADY, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICRO- MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
FEB 28...	0800	1250	8.2	10.0	290	140	65	31	140
DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
FEB 28...	3.6	12	184	0	110	240	.2	7.8	697

## 08145000 BRADY CREEK AT BRADY, TX

LOCATION.--Lat 31°08'17", long 99°20'05", McCulloch County, Hydrologic Unit 12090110, on left bank just upstream from bridge on U.S. Highway 377 on North Bridge Street in Brady, 0.4 mi (0.6 km) downstream from Live Oak Creek, and 29.5 mi (47.5 km) upstream from mouth.

DRAINAGE AREA.--575 mi<sup>2</sup> (1,489 km<sup>2</sup>).

PERIOD OF RECORD.--May 1939 to current year.

REVISED RECORDS.--WSP 1512: 1941(M), 1951(M).

GAGE.--Water-stage recorder. Datum of gage is 1,646.50 ft (501.853 m) above mean sea level. Prior to July 9, 1940, nonrecording gage at site 3,600 ft (1,100 m) upstream at datum 8.24 ft (2.512 m) higher.

REMARKS.--Records good. The city of Brady, which obtains its water supply from ground-water sources, reported that 505 acre-ft (623,000 m<sup>3</sup>) of sewage effluent was returned to Brady Creek downstream from the gage during the current year. Flow largely controlled since May 22, 1962, by Brady Creek Reservoir (station 08144900). At end of year, flow from 24.2 mi<sup>2</sup> (62.7 km<sup>2</sup>) above this station and below Brady Creek Reservoir was partly controlled by six floodwater-retarding structures with a combined capacity of 6,440 acre-ft (7.94 hm<sup>3</sup>) below flood-spillway crests. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--23 years (water years 1940-62) prior to completion of Brady Creek Reservoir, 25.2 ft<sup>3</sup>/s (0.714 m<sup>3</sup>/s), 18,260 acre-ft/yr (22.5 hm<sup>3</sup>/yr); 15 years (water years 1963-77) regulated, 12.8 ft<sup>3</sup>/s (0.362 m<sup>3</sup>/s), 9,270 acre-ft/yr (11.4 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,100 ft<sup>3</sup>/s (1,110 m<sup>3</sup>/s) Sept. 10, 1952, gage height, 24.80 ft (7.559 m); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1882, 29.1 ft (8.87 m) July 23, 1938, present site and datum, discharge at site 5 mi (8 km) downstream, 86,000 ft<sup>3</sup>/s (2,440 m<sup>3</sup>/s) by slope-area measurement. Flood of Oct. 6, 1930 (second highest since 1882), reached a stage of 25.9 ft (7.89 m), discharge 50,300 ft<sup>3</sup>/s (1,420 m<sup>3</sup>/s), present site and datum, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 589 ft<sup>3</sup>/s (16.7 m<sup>3</sup>/s) Mar. 27, gage height, 8.39 ft (2.557 m); minimum, 0.03 ft<sup>3</sup>/s (0.001 m<sup>3</sup>/s) Sept. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.14	5.3	2.5	2.7	1.8	.61	40	63	1.7	20	19	.21
2	.10	3.1	4.0	3.1	1.7	.58	40	33	1.6	20	19	.18
3	.06	3.7	3.8	3.4	1.8	4.7	37	7.9	1.3	20	19	.19
4	.27	4.9	3.5	3.5	1.8	.77	36	3.8	1.0	20	18	.20
5	2.1	4.4	3.1	3.3	1.6	.60	24	4.2	.91	20	19	.18
6	.60	4.1	2.5	3.2	1.5	.60	2.1	14	.76	19	19	.12
7	.81	3.1	1.9	3.2	1.5	.63	.77	31	.68	19	19	.07
8	.64	2.8	1.5	3.3	1.4	.63	2.3	32	.52	19	19	.05
9	.29	2.4	1.4	3.4	1.3	3.1	2.3	34	.48	19	19	.05
10	.30	1.8	1.3	3.8	1.3	21	2.0	32	.56	20	19	.05
11	.25	1.8	3.7	3.6	1.5	21	2.1	27	.52	19	19	.04
12	.16	2.4	2.6	6.2	1.5	21	1.8	21	.50	19	21	.04
13	.12	4.4	2.3	6.5	1.5	21	2.0	4.3	.48	19	21	.04
14	.10	4.2	7.1	6.6	1.2	21	4.8	15	.45	19	21	.04
15	.10	3.9	5.1	5.6	1.7	21	35	3.1	.41	19	20	.04
16	.28	4.4	4.3	5.2	8.4	20	42	1.6	.33	19	21	.04
17	.25	4.3	3.8	4.7	61	21	45	1.9	10	19	20	.04
18	.20	4.3	3.7	4.6	40	23	19	1.9	19	20	21	.28
19	.24	4.2	3.5	4.3	60	28	14	1.9	20	20	17	.85
20	.31	4.0	5.3	4.2	59	30	63	1.7	19	20	3.2	.28
21	.34	3.8	6.3	4.3	52	38	193	27	19	19	1.7	.14
22	.36	1.4	5.3	5.9	4.3	47	38	8.7	19	19	1.4	.10
23	.29	1.1	4.3	5.5	2.3	35	38	4.3	21	19	1.4	.10
24	.22	1.1	3.3	2.1	1.9	21	46	2.6	24	19	1.5	.08
25	.20	1.3	3.2	1.8	1.2	16	35	2.2	21	19	1.0	.07
26	.26	1.6	3.2	1.8	.97	5.7	9.9	4.7	20	19	.74	.06
27	2.5	2.4	3.1	1.7	.86	264	7.1	28	20	18	.62	.05
28	9.5	1.7	2.8	1.5	.63	35	8.5	29	20	19	.60	.04
29	32	1.7	2.7	1.3	---	14	48	29	20	19	.47	.04
30	29	1.8	2.8	1.9	---	35	56	21	20	19	.33	.04
31	9.6	---	2.8	2.1	---	39	---	2.6	---	18	.27	---
TOTAL	91.59	91.4	106.7	114.3	315.66	809.92	894.67	493.4	284.20	596	383.23	3.71
MEAN	2.95	3.05	3.44	3.69	11.3	26.1	29.8	15.9	9.47	19.2	12.4	.12
MAX	32	5.3	7.1	6.6	61	264	193	63	24	20	21	.85
MIN	.06	1.1	1.3	1.3	.63	.58	.77	1.6	.33	18	.27	.04
AC-FT	182	181	212	227	626	1610	1770	979	564	1180	760	7.4
CAL YR 1976	TOTAL	499.26	MEAN	1.36	MAX	32	MIN	.00	AC-FT	990		
WTR YR 1977	TOTAL	4184.78	MEAN	11.5	MAX	264	MIN	.04	AC-FT	8300		



## 08146000 SAN SABA RIVER AT SAN SABA, TX

LOCATION.--Lat 31°12'47", long 98°43'09", San Saba County, Hydrologic Unit 12090109, on right bank at downstream side of bridge on State Highway 16, 1.2 mi (1.9 km) north of San Saba, 2.7 mi (4.3 km) upstream from Mill Creek, 4.8 mi (7.7 km) downstream from China Creek, and 16.6 mi (26.7 km) upstream from mouth.

DRAINAGE AREA.--3,042 mi<sup>2</sup> (7,879 km<sup>2</sup>).

PERIOD OF RECORD.--December 1904 to December 1906 (gage heights only), September 1915 to current year. Published as "near San Saba" December 1904 to December 1906 and September 1915 to August 1930.

REVISED RECORDS.--WSP 458: 1915-16. WSP 1282: Drainage area. WSP 1512: 1918-19(M), 1922, 1931(M), 1935-36. WSP 1922: 1917.

GAGE.--Water-stage recorder. Datum of gage is 1,162.16 ft (354.226 m) above mean sea level. See WSP 1922 for history of changes prior to July 8, 1953. Since Oct. 1, 1956, supplementary water-stage recorder 2,780 ft (847 m) to right of main-channel gage used for flood-flows.

REMARKS.--Records good. Many diversions above station for irrigation and municipal use affect low flow. Flow partly affected by Brady Creek Reservoir (see station 08144900), capacity 90,300 acre-ft (111 hm<sup>3</sup>). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--62 years, 242 ft<sup>3</sup>/s (6.853 m<sup>3</sup>/s), 175,300 acre-ft/yr (216 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 203,000 ft<sup>3</sup>/s (5,750 m<sup>3</sup>/s) July 23, 1938, gage height, 39.3 ft (11.98 m), present site and datum, from rating curve extended above 41,000 ft<sup>3</sup>/s (1,160 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow at times in 1918, 1930, 1954-56, and 1963-64.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1899, that of July 23, 1938. Flood of June 6, 1899, reached a stage of 36.7 ft (11.19 m), present site and datum, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,000 ft<sup>3</sup>/s (85.0 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 31	0300	3,200	90.6	Apr. 30	1130	3,690	105
Apr. 17	0030	*10,500	297				13.94
			24.37				4.249

Minimum discharge, 67 ft<sup>3</sup>/s (1.90 m<sup>3</sup>/s) Sept. 3, 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	140	673	169	167	175	161	260	935	218	179	124	75
2	136	448	169	164	173	162	239	551	215	173	128	72
3	131	362	169	166	170	188	226	453	214	166	126	68
4	125	304	169	164	171	222	214	411	213	164	124	70
5	160	258	170	161	169	196	202	367	198	159	120	70
6	705	232	180	159	166	201	195	340	174	159	117	71
7	791	217	188	159	164	198	194	343	170	156	115	72
8	436	211	192	162	167	186	186	333	167	154	107	73
9	311	207	190	181	167	179	173	328	162	149	94	77
10	240	202	183	186	169	177	165	484	171	148	99	74
11	202	197	485	184	177	179	163	435	170	145	107	76
12	177	190	347	180	178	172	162	349	193	142	105	78
13	161	200	219	176	174	173	163	338	801	138	113	79
14	153	221	199	172	167	185	167	332	241	139	127	80
15	149	227	197	174	165	187	257	303	210	138	126	78
16	151	209	206	180	164	179	2420	285	201	138	123	78
17	156	204	202	172	164	177	5720	283	179	133	121	79
18	173	200	196	169	164	173	2650	275	168	128	123	77
19	157	197	192	166	177	169	945	269	164	125	123	77
20	149	197	185	164	208	160	926	265	161	131	120	78
21	147	197	178	164	201	155	1390	294	159	131	122	78
22	145	193	175	166	218	147	1070	304	170	126	121	77
23	144	186	171	171	212	148	611	304	172	123	117	75
24	144	180	170	180	183	146	481	282	187	119	109	74
25	143	180	172	180	164	150	424	256	653	114	104	73
26	141	183	172	177	161	168	399	242	586	112	105	72
27	141	179	170	174	161	416	375	240	318	113	101	71
28	168	175	170	168	159	849	345	236	233	112	100	71
29	250	170	165	164	---	689	398	233	202	119	97	69
30	1150	169	165	166	---	404	2190	226	188	128	95	69
31	2030	---	174	173	---	319	---	211	---	132	84	---
TOTAL	9406	6968	6089	5289	4888	7215	23310	10507	7258	4293	3497	2231
MEAN	303	232	196	171	175	233	777	339	242	138	113	74.4
MAX	2030	673	485	186	218	849	5720	935	801	179	128	80
MIN	125	169	165	159	159	146	162	211	159	112	84	68
AC-FT	18660	13820	12080	10490	9700	14310	46240	20840	14400	8520	6940	4430

CAL YR 1976	TOTAL	77646	MEAN 212	MAX 4290	MIN 65	AC-FT 154000
WTR YR 1977	TOTAL	90951	MEAN 249	MAX 5720	MIN 68	AC-FT 180400

## COLORADO RIVER BASIN

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## 08147000 COLORADO RIVER NEAR SAN SABA, TX

LOCATION.--Lat 31°13'04", long 98°33'51", San Saba-Lampasas County line, Hydrologic Unit 12090201, near left bank at downstream side of pier of bridge on U.S. Highway 190, 5.2 mi (8.4 km) downstream from San Saba River, 9.2 mi (14.8 km) east of San Saba, and at mile 474.3 (763.1 km).

DRAINAGE AREA.--30,600 mi<sup>2</sup> (79,250 km<sup>2</sup>), approximately, of which 12,880 mi<sup>2</sup> (33,360 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1915 to October 1922 (published as "near Chadwick"), October 1923 to August 1930 (published as "near Tow"), September 1930 to current year. Monthly discharge only for some periods, published in WSP 1312.

REVISED RECORDS.--WSP 458: 1916. WSP 858: 1900(M), 1936(M). WSP 1118: Drainage area. WSP 1512: 1916-18(M), 1936. WSP 1732: 1925-26(M).

GAGE.--Water-stage recorder. Datum of gage is 1,096.22 ft (334.128 m) above mean sea level. See WSP 1922 for history of changes prior to May 23, 1940.

REMARKS.--Water-discharge records good. Many diversions above station for irrigation, municipal use, and oilfield operation. Flow is affected by four reservoirs upstream from Winchell and one reservoir in the San Saba River and Pecan Bayou basins; combined capacity, 1,973,000 acre-ft (2.43 km<sup>3</sup>). Flow is affected at times by discharge from the flood-detention pools of 181 floodwater-retarding structures with combined detention capacity of 194,770 acre-ft (240 km<sup>3</sup>). These structures control runoff from 891 mi<sup>2</sup> (2,308 km<sup>2</sup>).

AVERAGE DISCHARGE.--59 years (water years 1917-19, 1921-22, 1924-77), 1,251 ft<sup>3</sup>/s (35.43 m<sup>3</sup>/s), 906,300 acre-ft/yr (1,120 km<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 224,000 ft<sup>3</sup>/s (6,340 m<sup>3</sup>/s) July 23, 1938, gage height, 63.2 ft (19.26 m), present site, based on floodmarks at site then in use; no flow Aug. 27-31, 1954; Aug. 3-13, 1963; July 20 to Aug. 8, Aug. 11-14, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage during period 1878 to July 22, 1938, 58.4 ft (17.80 m) Sept. 25, 1900, discharge, 184,000 ft<sup>3</sup>/s (5,210 m<sup>3</sup>/s), present site, from floodmarks at former site.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 18,100 ft<sup>3</sup>/s (513 m<sup>3</sup>/s) Apr. 30, gage height, 16.62 ft (5.066 m); minimum, 110 ft<sup>3</sup>/s (3.12 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	506	3810	363	400	412	307	1040	12500	500	607	244	159
2	469	2220	378	406	419	312	830	5390	519	507	232	147
3	369	1500	389	419	419	448	697	3160	611	430	222	144
4	304	1110	387	425	412	422	591	2380	568	383	204	179
5	328	885	391	412	412	402	511	1950	613	343	189	182
6	586	743	401	412	419	368	453	1730	589	311	176	161
7	1380	638	405	419	406	355	410	1590	477	296	176	154
8	749	572	396	425	400	327	375	1430	408	286	172	156
9	494	527	394	419	400	306	344	1320	367	275	164	158
10	375	493	387	406	393	301	315	1270	355	266	144	163
11	324	461	405	412	419	299	296	1400	338	286	141	160
12	308	428	420	425	432	291	276	1070	615	267	143	164
13	303	440	447	459	425	284	268	1020	2110	245	149	166
14	301	450	448	493	439	288	291	1010	713	226	154	165
15	300	465	436	513	419	283	1160	1010	456	212	168	167
16	301	467	452	506	393	269	2590	1330	394	202	170	164
17	309	479	469	500	387	256	14100	3000	360	193	183	158
18	466	471	472	480	381	248	11100	2520	325	194	181	160
19	337	466	465	473	357	240	6550	1320	303	198	179	160
20	276	467	458	445	393	226	4480	928	294	195	178	160
21	256	462	442	439	400	215	6690	873	281	198	176	162
22	255	442	432	432	406	206	10000	835	276	201	193	196
23	266	423	425	432	406	197	4890	806	279	189	194	176
24	263	407	425	425	369	194	2800	1080	279	179	192	158
25	259	401	419	452	329	192	2990	1890	540	175	200	151
26	256	394	419	445	323	195	3690	1160	3390	175	184	150
27	247	385	412	439	318	4070	2860	800	1340	173	176	145
28	257	370	412	432	307	10200	1680	641	1010	290	164	127
29	386	360	412	419	---	3510	3020	561	845	349	164	119
30	2210	359	406	412	---	1810	15600	519	715	402	168	112
31	4500	---	400	425	---	1420	---	496	---	272	175	---
TOTAL	17940	21095	12967	13601	10995	28441	100897	56989	19870	8525	5555	4723
MEAN	579	703	418	439	393	917	3363	1838	662	275	179	157
MAX	4500	3810	472	513	439	10200	15600	12500	3390	607	244	196
MIN	247	359	363	400	307	192	268	496	276	173	141	112
AC-FT	35580	41840	25720	26980	21810	56410	200100	113000	39410	16910	11020	9370
CAL YR 1976	TOTAL	174132	MEAN 476	MAX 8310	MIN 107	AC-FT 345400						
WTR YR 1977	TOTAL	301598	MEAN 826	MAX 15600	MIN 112	AC-FT 598200						

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: September 1947 to current year. Chemical and biochemical analyses: October 1969 to current year. Pesticide analyses: January 1968 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1947 to current year.

WATER TEMPERATURES: October 1947 to current year.

SUSPENDED SEDIMENT DISCHARGE: December 1950 to September 1962.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 5,660 micromhos June 28, 1962; minimum daily, 161 micromhos Sept. 11, 1952.

WATER TEMPERATURES: Maximum daily, 37.0°C Aug. 3, 1956; minimum daily, 0.0°C Jan. 29, 1948, Jan. 30, 1951.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,540 micromhos July 30; minimum daily, 347 micromhos Apr. 30.

WATER TEMPERATURES: Maximum daily, 33.0°C on several days during summer months; minimum daily, 4.0°C Jan. 9.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	HARD- NESS (CA, MG) (MG/L)	
DATE	TIME									
OCT 12...	1415	310	546	8.3	20.0	9.0	102	1.2	220	
NOV 30...	1730	350	966	8.3	9.0	--	--	--	310	
DEC 06...	1230	400	1110	7.5	9.5	11.5	105	1.4	390	
FEB 22...	1343	420	1180	8.0	16.5	12.9	136	2.0	390	
MAR 31...	1130	1400	566	7.9	17.0	--	--	--	190	
APR 18...	1240	11400	499	7.2	18.5	7.3	80	1.9	160	
JUN 13...	1226	1800	527	7.7	26.5	6.6	84	2.3	200	
JUL 06...	1130	314	610	7.8	29.0	--	--	--	230	
AUG 01...	1730	240	1100	8.4	30.0	9.6	128	3.8	330	
		NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)
DATE										
OCT 12...	46	58	19	25	.7	3.7	216	0	30	
NOV 30...	110	72	32	76	1.9	4.2	240	0	92	
DEC 06...	170	94	37	84	1.9	3.9	270	0	100	
FEB 22...	180	85	42	95	2.1	3.9	248	0	120	
MAR 31...	46	51	14	36	1.2	4.3	170	0	42	
APR 18...	65	44	12	32	1.1	4.2	115	0	42	
JUN 13...	24	44	21	31	1.0	3.9	210	0	37	
JUL 06...	62	56	21	36	1.0	5.7	200	0	49	
AUG 01...	160	70	38	95	2.3	5.0	210	0	140	
		DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- TENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)
DATE										
OCT 12...	45	.3	12	299	.72	.01	.01	.55	.09	
NOV 30...	140	.3	11	546	--	--	--	--	--	
DEC 06...	160	.3	10	622	1.7	.01	.01	.58	.06	
FEB 22...	180	.3	6.5	655	1.9	.00	.02	.59	.04	
MAR 31...	67	.2	9.0	307	--	--	--	--	--	
APR 18...	65	.2	8.8	265	.38	.01	.08	3.3	.35	
JUN 13...	52	.2	9.6	302	.17	.02	.03	.82	.22	
JUL 06...	71	.2	13	351	--	--	--	--	--	
AUG 01...	160	.4	14	626	.03	.01	.00	.89	.08	

COLORADO RIVER BASIN

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08147000 COLORADO RIVER NEAR SAN SABA, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		POLY-CHLORINATED NAPH-THA-LENES											
DATE	TIME	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR-DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)		
APR 18...	1240	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00		
AUG 01...	1730	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00		
DATE	TIME	TOTAL HEPTA-CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA-THION (UG/L)	TOTAL METHYL PARA-THION (UG/L)	TOTAL METHYL TRI-THION (UG/L)	TOTAL PARA-THION (UG/L)	TOTAL TOX-APHENE (UG/L)	TOTAL TRI-THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)	
APR 18...	.00	.00	.00	.00	.00	.00	.00	0	.00	.20	.00	.00	
AUG 01...	.00	.00	.00	.00	.00	.00	.00	0	.00	.01	.00	.00	

MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA,MG) (MG/L)
OCT. 1976.....	17940	700	390	18700	82	3960	55	2640	250
NOV. 1976.....	21095	889	490	28000	110	6450	84	4800	310
DEC. 1976.....	12967	1210	680	23900	180	6250	140	4730	400
JAN. 1977.....	13601	1270	720	26500	190	7130	150	5390	420
FEB. 1977.....	10995	1250	710	21100	190	5650	140	4260	410
MAR. 1977.....	28441	790	440	33700	100	7740	69	5260	280
APR. 1977.....	100897	606	330	91100	65	17800	42	11600	220
MAY 1977.....	56989	687	380	58400	79	12200	55	8510	250
JUNE 1977.....	19870	749	410	22100	88	4740	63	3360	260
JULY 1977.....	8525	811	450	10400	100	2340	72	1670	280
AUG. 1977.....	5555	1020	570	8530	140	2050	100	1570	340
SEPT 1977.....	4723	1130	640	8110	160	2040	120	1560	380
TOTAL .....	301598	**	**	351000	**	78300	**	55300	**
WTD.AVG. ....	826.3	774	430	**	96	**	68	**	270

## COLORADO RIVER BASIN

08147000 COLORADO RIVER NEAR SAN SABA, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	644	748	1000	1270	1260	1290	617	380	868	490	1080	1140
2	671	1140	991	1270	1260	1290	733	546	833	468	1070	1130
3	741	1100	1070	1210	1270	1360	807	590	820	543	1120	1130
4	725	1060	1080	1230	1280	1110	917	625	833	582	1100	1250
5	647	859	1100	1070	1280	1210	987	656	838	601	1090	1320
6	568	807	1110	1220	1290	1280	1000	636	867	625	1080	1240
7	461	801	1120	1260	1280	1170	961	644	854	656	1120	1160
8	539	787	1140	1250	1250	1190	969	663	844	698	1050	1120
9	603	779	1130	1270	1250	1190	974	682	851	742	1070	1090
10	605	766	1160	1300	1280	1140	982	725	842	781	1010	1080
11	575	779	1150	1270	1200	1160	961	725	850	851	948	1100
12	541	784	1170	1280	1280	1170	969	784	836	838	891	1100
13	515	789	1160	1290	1280	1190	957	800	467	837	849	1110
14	605	793	1190	1280	1310	1190	925	814	556	793	870	1120
15	633	793	1230	1300	1290	1160	694	847	620	810	853	1130
16	640	813	1220	1300	1290	1160	899	882	633	793	875	1140
17	650	831	1240	1290	1280	1140	539	1200	745	793	898	1100
18	659	825	1250	1310	1270	1120	493	967	794	835	902	1090
19	742	843	1270	1290	1230	1120	725	853	726	874	913	1090
20	776	850	1300	1280	1220	1120	758	820	748	862	940	1100
21	799	873	1320	1300	1160	1110	552	792	775	885	973	1110
22	810	904	1320	1290	1170	1120	511	777	804	888	1040	1210
23	822	915	1310	1280	1130	1100	593	800	824	884	1060	1180
24	776	915	1300	1280	1190	1100	706	823	812	861	1060	1130
25	761	904	1320	1250	1220	1090	710	882	812	875	1030	1100
26	761	930	1210	1280	1270	1090	1040	947	939	885	1040	1080
27	783	950	1300	1280	1290	1120	914	951	763	914	1040	1090
28	815	930	1300	1270	1280	516	845	951	636	1190	1070	1070
29	833	991	1300	1280	---	617	637	955	518	1300	1090	1000
30	1120	1020	1290	1290	---	516	347	963	500	1540	1110	982
31	630	---	1270	1280	---	548	---	917	---	1170	1160	---
MEAN	692	876	1200	1270	1250	1090	791	793	760	834	1010	1120

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25.0	14.0	---	5.0	7.0	16.0	20.0	23.0	28.0	30.0	31.0	31.0
2	25.0	15.0	10.0	5.0	11.0	20.0	21.0	23.0	30.0	31.0	30.0	31.0
3	25.0	---	11.0	8.0	---	15.0	23.0	24.0	30.0	31.0	31.0	33.0
4	---	15.0	10.0	10.0	11.0	17.0	20.0	25.0	31.0	31.0	---	---
5	22.0	15.0	10.0	10.0	12.0	15.0	21.0	25.0	31.0	30.0	---	30.0
6	---	17.0	---	8.0	13.0	16.0	20.0	25.0	29.0	30.0	31.0	30.0
7	---	18.0	7.0	10.0	12.0	17.0	21.0	26.0	30.0	31.0	30.0	30.0
8	---	17.0	11.0	---	14.0	18.0	23.0	25.0	30.0	31.0	32.0	30.0
9	---	18.0	12.0	4.0	14.0	17.0	24.0	23.0	30.0	31.0	31.0	30.0
10	---	19.0	12.0	7.0	13.0	18.0	23.0	25.0	31.0	30.0	30.0	30.0
11	---	15.0	8.0	5.0	15.0	15.0	22.0	24.0	---	30.0	33.0	31.0
12	---	---	10.0	---	15.0	---	21.0	25.0	32.0	31.0	30.0	30.0
13	---	---	10.0	8.0	15.0	20.0	21.0	25.0	28.0	30.0	31.0	28.0
14	22.0	13.0	11.0	8.0	15.0	21.0	20.0	24.0	28.0	31.0	33.0	27.0
15	20.0	7.0	12.0	10.0	16.0	20.0	16.0	25.0	30.0	32.0	32.0	27.0
16	---	9.0	---	8.0	16.0	19.0	17.0	24.0	30.0	33.0	---	27.0
17	20.0	9.0	12.0	9.0	---	22.0	15.0	24.0	31.0	30.0	32.0	28.0
18	20.0	10.0	13.0	8.0	17.0	21.0	20.0	24.0	31.0	---	30.0	28.0
19	16.0	13.0	14.0	8.0	15.0	20.0	21.0	25.0	30.0	30.0	31.0	---
20	18.0	16.0	10.0	9.0	15.0	20.0	19.0	25.0	31.0	30.0	30.0	---
21	15.0	18.0	10.0	---	16.0	19.0	20.0	26.0	---	31.0	29.0	---
22	---	12.0	10.0	10.0	19.0	---	21.0	26.0	29.0	33.0	30.0	---
23	18.0	11.0	10.0	9.0	16.0	17.0	20.0	---	26.0	33.0	30.0	---
24	19.0	14.0	---	11.0	20.0	18.0	23.0	27.0	27.0	33.0	30.0	---
25	15.0	14.0	9.0	12.0	20.0	18.0	22.0	26.0	29.0	---	30.0	---
26	16.0	17.0	11.0	13.0	15.0	18.0	23.0	28.0	29.0	32.0	31.0	---
27	14.0	11.0	13.0	12.0	14.0	19.0	24.0	30.0	30.0	33.0	31.0	---
28	14.0	7.0	11.0	12.0	15.0	18.0	24.0	28.0	29.0	32.0	30.0	---
29	12.0	8.0	8.0	8.0	---	22.0	20.0	28.0	30.0	31.0	30.0	---
30	17.0	9.0	---	6.0	---	20.0	22.0	29.0	---	32.0	31.0	---
31	15.0	---	7.0	12.0	---	17.0	---	29.0	---	33.0	31.0	---
MEAN	18.5	13.5	10.5	9.0	14.5	18.5	21.0	25.5	29.5	31.0	31.0	29.5



## 08148000 LAKE BUCHANAN NEAR BURNET, TX

LOCATION.--Lat 30°45'04", Long 98°25'06", Burnet County, Hydrologic Unit 12090201, in powerhouse at Buchanan Dam on Colorado River, 1.3 mi (2.1 km) upstream from bridge on State Highway 29, 11 mi (18 km) west of Burnet, and at mile 413.6 (665.5 km).

DRAINAGE AREA.--31,250 mi<sup>2</sup> (80,940 km<sup>2</sup>), approximately, of which 12,880 mi<sup>2</sup> (33,360 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--May 1937 to current year. Prior to Oct. 1, 1968, published as Buchanan Reservoir.

REVISED RECORDS.--WSP 1118: Drainage area.

GAGE.--Nonrecording gage. Datum of gage is 0.48 ft (0.146 m) above mean sea level (levels by Lower Colorado River Authority). Prior to July 1938, temporary staff and float gages at same site and datum.

REMARKS.--The lake is formed by two reinforced concrete multiple-arch sections, three banks of tainter gates, a 1,100-foot (335-meter) uncontrolled concrete spillway section, and natural ground. A net opening of 1,270 ft (387 m) is controlled by thirty 33- by 15-foot (10- by 5-meter) and by seven 40- by 15-foot (12- by 5-meter) tainter gates. The dam was completed and storage began May 20, 1937. Water is used for power development and for irrigation below Columbus. The power generating features consist of three generating units, each with a 12,677 kilowatt capacity. A pump-back unit (capacity, 840 ft<sup>3</sup>/s or 23.8 m<sup>3</sup>/s) returns water from Inks Lake to Lake Buchanan during off-peak power demand periods. Inflow is largely regulated by twelve major reservoirs with a combined capacity of 2,438,000 acre-ft (3.01 km<sup>3</sup>), of which 1,091,000 acre-ft (1.35 km<sup>3</sup>) is for flood control. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Colorado River near San Saba (station 08147000). The capacity table is based on a 1925 survey. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam.....	1,025.5	-
Crest of gravity overflow spillway (top of conservation storage).....	1,020.0	992,000
Crest of spillway (15-foot gates).....	1,005.0	678,000
Crest of spillway (25-foot gates).....	995.0	505,000
Invert of three 12-foot-diameter penstocks.....	937.0	36,800

COOPERATION.--Gage-height record furnished by Lower Colorado River Authority.

EXTREMES (at 2400) FOR PERIOD OF RECORD.--Maximum contents, 1,010,000 acre-ft (1.25 km<sup>3</sup>) Jan. 24, 1968, gage height, 1,020.8 ft (311.14 m); minimum after initial filling of lake in July 1938, 340,800 acre-ft (420 hm<sup>3</sup>) Sept. 8-10, 1952, gage height, 983.4 ft (299.74 m).

EXTREMES (at 2400) FOR CURRENT YEAR.--Maximum contents observed, 985,100 acre-ft (1.21 km<sup>3</sup>) Apr. 30, gage height, 1,019.7 ft (310.80 m); minimum, 851,700 acre-ft (1.05 km<sup>3</sup>) Sept. 28-30; gage height, 1,013.7 ft (308.98 m).

Capacity table (gage height, in feet, and total contents, in acre-feet)

1,013.0	837,000	1,018.0	946,000
1,016.0	902,000	1,020.0	992,000

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	950600	959800	924000	948300	941600	952900	955200	982800	937200	919600	899800	877800
2	950600	962100	924000	946000	943800	955200	950600	973600	935000	917400	899800	877800
3	950600	962100	924000	943800	943800	955200	948300	973600	932800	917400	899800	877800
4	950600	962100	924000	943800	943800	955200	946000	973600	928400	917400	897600	877800
5	950600	959800	926200	943800	946000	955200	943800	971300	926200	917400	897600	877800
6	950600	957500	928400	943800	946000	957500	941600	969000	924000	917400	897600	877800
7	948300	957500	928400	946000	946000	957500	939400	969000	921800	915200	897600	877800
8	948300	955200	928400	948300	946000	957500	939400	966700	919600	915200	895400	877800
9	948300	952900	928400	946000	946000	955200	939400	964400	917400	915200	893200	875600
10	948300	950600	932800	941600	946000	955200	939400	962100	917400	915200	891000	875600
11	948300	948300	932800	941600	946000	952900	939400	962100	915200	915200	891000	869000
12	948300	948300	935000	943800	948300	952900	941600	964400	919600	910800	891000	866800
13	950600	943800	935000	943800	948300	955200	941600	959800	921800	910800	888800	869000
14	950600	943800	937200	946000	950600	955200	941600	957500	924000	910800	888800	869000
15	950600	943800	937200	946000	948300	955200	955200	955200	921800	910800	886600	869000
16	950600	943800	939400	946000	948300	955200	955200	952900	921800	910800	886600	869000
17	950600	943800	939400	943800	948300	957500	957500	952900	919600	910800	884400	866800
18	950600	943800	939400	941600	948300	957500	952900	955200	919600	910800	884400	866800
19	950600	946000	941600	939400	948300	957500	952900	950600	919600	908600	884400	864600
20	950600	946000	941600	937200	948300	957500	957500	948300	917400	904200	884400	864600
21	948300	948300	941600	937200	950600	957500	964400	946000	919600	902000	884400	864600
22	948300	943800	943800	939400	950600	957500	964400	943800	919600	899800	884400	864600
23	948300	941600	943800	941600	952900	957500	978200	943800	919600	899800	882200	864600
24	948300	939400	943800	941600	955200	955200	982800	943800	919600	899800	880000	862400
25	948300	939400	946000	941600	955200	952900	982800	946000	917400	899800	880000	860200
26	948300	937200	946000	943800	955200	950600	982800	946000	921800	899800	880000	858000
27	948300	935000	946000	943800	955200	950600	980500	946000	921800	899800	877800	853800
28	948300	932800	948300	946000	955200	966700	978200	943800	921800	899800	877800	851700
29	946000	928400	948300	943800	---	969000	978200	94100	921800	899800	877800	851700
30	946000	924000	948300	946000	---	964400	985100	939400	921800	899800	877800	851700
31	955200	---	946000	943800	---	959800	---	939400	---	899800	877800	---
(†)	1018.4	1017.0	1018.0	1017.9	1018.4	1018.6	1019.7	1017.7	1016.9	1015.9	1014.9	1013.7
(*)	+4600	-31200	+22000	-2200	+11400	+4600	+25300	-45700	-17600	-22000	-26100	-26100
MAX	955200	962100	948300	948300	955200	969000	985100	982800	937200	919600	899800	877800
MIN	946000	924000	924000	937200	941600	950600	939400	939400	915200	899800	877800	851700

CAL YR 1976 MAX 987400 MIN 917400 \* +24200  
WTR YR 1977 MAX 985100 MIN 851700 \* -98900

† Gage height, in feet, at end of month.

\* Change in contents, in acre-feet.





## 08150000 LLANO RIVER NEAR JUNCTION, TX

LOCATION.--Lat 30°29'45", long 99°43'19", Kimble County, Hydrologic Unit 12090204, on right bank 600 ft (180 m) north of Farm Road 2169, 1.4 mi (2.3 km) east of Junction, 3.6 mi (5.8 km) downstream from bridge on Interstate Highway 10, 3.9 mi (6.3 km) downstream from confluence of North Llano and South Llano Rivers, 4.3 mi (6.9 km) upstream from Johnson Fork, and 106.7 mi (171.7 km) upstream from mouth.

DRAINAGE AREA.--1,874 mi<sup>2</sup> (4,854 km<sup>2</sup>).

PERIOD OF RECORD.--September 1915 to current year.

REVISED RECORDS.--WSP 568: 1915-16, 1918-20, 1922. WSP 1342: Drainage area. WSP 1922: 1920, 1923.

GAGE.--Water-stage recorder. Datum of gage is 1,630.32 ft (496.922 m) above mean sea level. Prior to Aug. 14, 1925, nonrecording gage, and Aug. 14, 1925, to May 17, 1940, water-stage recorder at present site and datum. May 18, 1940, to Aug. 17, 1944, water-stage recorder at site 5,330 ft (1,620 m) upstream at datum 6.0 ft (1.83 m) higher. Since Aug. 18, 1944, gage at site 5,330 ft (1,620 m) upstream has been used as a supplementary gage.

REMARKS.--Records good. Diversions above station for irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--62 years, 194 ft<sup>3</sup>/s (5.494 m<sup>3</sup>/s), 140 in/yr (36 mm/yr), 140,600 acre-ft/yr (173 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 319,000 ft<sup>3</sup>/s (9,030 m<sup>3</sup>/s) June 14, 1935, gage height, 43.3 ft (13.20 m) at regular gage, 41.4 ft (12.62 m) at supplementary gage, from floodmarks, from rating curve extended above 54,000 ft<sup>3</sup>/s (1,530 m<sup>3</sup>/s) on basis of slope-area measurements of 154,000 and 319,000 ft<sup>3</sup>/s (4,360 and 9,030 m<sup>3</sup>/s); minimum, 3.1 ft<sup>3</sup>/s (0.088 m<sup>3</sup>/s) Aug. 16, 17, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1875, that of June 14, 1935. There was a major flood in 1889 which was the highest known prior to June 14, 1935.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft<sup>3</sup>/s (42.5 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 29	1630	4,900	139	5.30	1.615	May 11	0430	*41,600	1,180	15.76	4.804
				a6.28	1.914					a21.58	6.578
Apr. 15	2130	32,900	932	13.89	4.234	June 24	1130	4,020	114	4.90	1.494
				a19.53	5.953					a5.48	1.670

a From supplementary gage.

Minimum discharge, 131 ft<sup>3</sup>/s (3.71 m<sup>3</sup>/s) Oct. 4.

## DISCHARGE, IN CUBIC FEET PER SECOND, WATER MEAN VALUES YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	230	376	214	190	176	149	163	384	363	230	162	144
2	193	363	211	190	173	151	163	383	363	227	158	144
3	162	361	210	190	175	154	163	384	359	222	157	143
4	131	342	202	190	169	155	163	390	350	216	155	143
5	141	326	206	190	166	150	163	394	343	214	156	142
6	141	314	209	190	166	149	161	402	333	214	154	145
7	141	303	201	190	166	149	161	406	326	211	154	153
8	144	295	198	185	175	148	161	404	314	210	152	155
9	144	287	201	185	174	147	161	401	309	208	152	156
10	144	276	202	185	170	145	161	407	298	205	151	152
11	144	270	212	185	172	143	161	15400	293	201	150	149
12	144	265	209	185	168	144	161	1320	288	198	154	146
13	144	272	209	185	166	143	162	750	283	191	160	147
14	144	263	238	185	164	145	184	599	279	191	162	146
15	148	257	222	185	159	145	13900	537	274	190	159	144
16	158	253	212	185	159	145	8880	491	268	186	154	142
17	158	261	207	185	159	145	4270	467	261	183	151	141
18	158	253	207	185	159	141	1210	442	257	183	148	141
19	166	248	207	181	158	141	796	423	254	182	150	146
20	166	243	201	181	157	141	672	408	249	181	150	144
21	166	238	198	181	158	141	606	467	245	179	148	141
22	166	228	198	187	158	141	540	418	245	180	147	139
23	166	226	198	192	157	141	500	392	271	177	147	138
24	162	226	198	185	152	138	472	381	876	175	154	138
25	162	226	198	177	149	138	450	377	368	173	155	138
26	162	224	194	176	150	138	438	370	280	170	149	138
27	173	218	193	173	148	156	435	370	256	167	145	137
28	230	216	190	173	148	156	411	369	243	165	146	134
29	1710	216	190	170	---	250	402	364	237	171	147	133
30	1300	216	190	176	---	200	392	363	234	169	146	133
31	522	---	190	178	---	175	---	363	---	166	146	---
TOTAL	8020	8062	6315	5695	4551	5301	36662	29026	9319	5935	4719	4292
MEAN	259	269	204	184	163	171	1222	936	311	191	152	143
MAX	1710	376	238	192	176	156	13900	15400	876	230	162	156
MIN	131	216	190	170	148	138	161	363	234	165	145	133
CFSM	.14	.14	.11	.10	.09	.09	.65	.50	.17	.10	.08	.08
IN.	.16	.16	.13	.11	.09	.11	.73	.58	.18	.12	.09	.09
AC-FT	15910	15990	12530	11300	9030	10510	72720	57570	18480	11770	9360	8510
CAL YR 1976	TOTAL	76773	MEAN 210	MAX 350	6290	MIN 113	CFSM .11	IN 1.52	AC-FT 152300			
WTR YR 1977	TOTAL	127897	MEAN 350	MAX 15400		MIN 131	CFSM .19	IN 2.54	AC-FT 253700			

## COLORADO RIVER BASIN

08150700 LLANO RIVER NEAR MASON, TX

LOCATION.--Lat 30°39'35", long 99°06'29", Mason County, Hydrologic Unit 12090204, on right bank 98 ft (30 m) downstream from downstream bridge on U.S. Highway 87, 1.0 mi (1.6 km) upstream from Beaver Creek, 9.1 mi (14.6 km) southeast of Mason, 10.2 mi (16.4 km) downstream from James River, and 54.5 mi (87.7 km) upstream from mouth.

DRAINAGE AREA.--3,280 mi<sup>2</sup> (8,500 km<sup>2</sup>).

PERIOD OF RECORD.--March 1968 to current year.

REVISED RECORD.--WDR TX-75-3: 1968(P).

GAGE.--Water-stage recorder. Datum of gage is 1,230.36 ft (375.014 m) above mean sea level. Prior to Jan. 19, 1971, at site 190 ft (58 m) upstream at same datum.

REMARKS.--Records good. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--9 years (water years 1969-77), 373 ft<sup>3</sup>/s (10.56 m<sup>3</sup>/s), 1.53 in/yr (39 mm/yr), 270,200 acre-ft/yr (333 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 151,000 ft<sup>3</sup>/s (4,280 m<sup>3</sup>/s) Oct. 13, 1973, gage height, 26.30 ft (8.016 m), from rating curve extended above 59,000 ft<sup>3</sup>/s (1,670 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; minimum, 16 ft<sup>3</sup>/s (0.45 m<sup>3</sup>/s) July 23, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum flood since at least 1875 occurred June 14, 1935, discharge 388,000 ft<sup>3</sup>/s (11,000 m<sup>3</sup>/s), by slope-area measurement of peak flow at site 17.0 mi (27.4 km) downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,000 ft<sup>3</sup>/s (85.0 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 30	0900	4,720	134	6.27	1.911	May 11	1300	40,900	1,160	14.98	4.566
Apr. 16	0300	*52,000	1,470	16.64	5.072						

Minimum discharge, 134 ft<sup>3</sup>/s (3.79 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	217	870	276	240	248	209	288	656	394	254	172	146
2	213	670	277	256	246	213	276	597	396	248	169	146
3	201	562	269	264	240	233	260	556	376	242	167	146
4	201	501	265	264	236	236	242	533	362	231	163	146
5	221	457	271	255	229	236	229	510	350	229	162	142
6	213	426	294	252	224	228	222	495	337	222	160	142
7	217	402	278	247	221	223	217	488	331	217	158	142
8	225	387	274	244	225	218	209	473	326	216	159	157
9	221	369	263	234	233	209	209	466	319	211	156	153
10	221	357	264	229	246	210	209	564	316	207	152	159
11	213	354	299	229	250	213	209	14600	301	206	153	165
12	205	357	326	243	246	213	206	4170	298	199	153	162
13	205	377	314	259	237	206	205	1430	297	197	155	149
14	201	377	336	268	233	197	226	1020	291	194	168	146
15	217	366	365	262	228	197	10400	849	285	194	165	146
16	351	354	361	245	221	197	25300	763	285	194	162	146
17	240	350	323	236	218	197	8430	705	279	183	162	146
18	233	344	308	232	221	202	3090	663	277	188	159	146
19	225	352	299	227	221	201	1560	614	277	183	155	146
20	229	352	289	229	214	192	1700	572	268	183	154	148
21	229	329	276	229	213	190	1690	623	259	183	152	149
22	221	314	269	236	216	190	1220	663	255	182	149	148
23	213	308	263	270	217	189	1010	581	265	179	149	143
24	213	304	265	274	202	190	898	502	300	179	154	143
25	213	304	265	261	201	194	817	462	880	177	157	140
26	213	304	261	244	205	199	763	441	476	176	154	140
27	213	293	260	236	205	372	712	425	337	176	151	140
28	225	281	253	230	205	751	698	418	291	172	149	138
29	531	273	248	222	---	611	670	411	273	183	149	137
30	2670	273	247	226	---	376	741	398	261	175	149	137
31	1600	---	242	242	---	323	---	392	---	180	146	---
TOTAL	11010	11567	8800	7585	6301	7815	62906	36040	9962	6160	4863	4394
MEAN	355	386	284	245	225	252	2097	1163	332	199	157	146
MAX	2670	870	365	274	250	751	25300	14600	880	254	172	165
MIN	201	273	242	222	201	189	205	392	255	172	146	137
CFSM	.11	.12	.09	.08	.07	.08	.64	.36	.10	.06	.05	.05
IN.	.12	.13	.10	.09	.07	.09	.71	.41	.11	.07	.06	.05
AC-FT	21840	22940	17450	15040	12500	15500	124800	71490	19760	12220	9650	8720
CAL YR 1976	TOTAL	102471	MEAN 280	MAX 9070	MIN 111	CFSM .09	IN 1.16	AC-FT 203300				
WTR YR 1977	TOTAL	177403	MEAN 486	MAX 25300	MIN 137	CFSM .15	IN 2.01	AC-FT 351900				

## COLORADO RIVER BASIN

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08150800 BEAVER CREEK NEAR MASON, TX

LOCATION.--Lat 30°38'36", Long 99°05'44", Mason County, Hydrologic Unit 12090204, on left bank at upstream side of bridge on U.S. Highway 87, 1.4 mi (2.3 km) upstream from Llano River, 6.4 mi (10.3 km) downstream from Spring Creek, and 11.1 mi (17.9 km) southeast of Mason.

DRAINAGE AREA.--218 mi<sup>2</sup> (565 km<sup>2</sup>).

PERIOD OF RECORD.--July 1963 to current year.

REVISED RECORDS.--WSP 2122: 1964-65.

GAGE.--Water-stage recorder. Datum of gage is 1,253.24 ft (381.988 m) above mean sea level.

REMARKS.--Records fair. No known regulation or diversion above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--14 years, 18.2 ft<sup>3</sup>/s (0.515 m<sup>3</sup>/s), 1.13 in/yr (29 mm/yr), 13,190 acre-ft/yr (16.3 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,200 ft<sup>3</sup>/s (657 m<sup>3</sup>/s) May 16, 1965, gage height, 13.58 ft (4.139 m), from rating curve extended above 7,400 ft<sup>3</sup>/s (210 m<sup>3</sup>/s) on basis of slope-area measurement of 20,100 ft<sup>3</sup>/s (569 m<sup>3</sup>/s); no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 15	0115	*10,000 283	8.76 2.670	Apr. 20	0300	1,340 37.9	4.99 1.521

Minimum discharge, no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	16	3.8	3.5	6.4	4.8	5.8	26	6.1	.82	.02	.02
2	3.0	12	3.7	4.2	5.8	5.0	5.9	23	8.1	.72	.05	.02
3	2.2	10	3.4	5.1	5.5	8.6	6.2	20	5.9	.60	.04	.02
4	1.8	9.4	3.2	5.2	5.2	14	5.3	19	4.7	.43	.03	.01
5	2.4	8.2	3.4	4.5	4.9	9.3	4.5	18	3.7	.37	.00	.01
6	3.5	7.4	5.5	4.4	4.1	7.3	4.4	17	3.4	.32	.00	.04
7	3.5	7.0	5.9	4.4	4.1	6.7	4.3	16	5.2	.27	.00	.03
8	3.6	6.6	5.2	4.4	4.3	6.2	4.1	15	4.3	.16	.00	.02
9	4.1	6.1	4.6	4.1	5.0	5.9	4.1	16	3.3	.16	.00	.02
10	4.0	5.9	4.4	3.5	5.2	5.9	4.1	63	2.4	.10	.01	.02
11	3.0	5.9	6.0	3.5	5.9	5.9	4.1	33	2.0	.05	.00	.03
12	2.4	5.6	9.2	4.1	6.6	5.5	4.0	27	1.6	.01	.01	.03
13	2.0	8.4	7.7	5.8	5.8	5.2	4.0	18	1.8	.01	.03	.03
14	1.8	12	9.8	6.4	5.2	5.2	11	16	1.5	.02	.02	.02
15	2.3	9.5	11	5.6	4.2	5.2	2370	16	1.4	.02	.01	.02
16	11	7.7	9.0	4.9	4.1	5.2	402	16	1.4	.02	.00	.01
17	24	7.0	8.1	4.3	4.1	5.2	106	15	1.3	.02	.00	.01
18	8.4	6.6	7.7	4.1	4.1	5.3	83	14	1.2	.02	.00	.01
19	5.0	6.4	7.7	3.8	4.4	5.5	86	14	.93	.02	.00	.01
20	5.4	6.4	7.7	3.8	4.1	5.3	301	12	.82	.01	.00	.02
21	5.8	6.2	6.8	3.8	4.1	5.0	143	24	.73	.01	.01	.02
22	4.1	5.4	6.4	4.8	4.3	5.0	84	19	.66	.01	.01	.03
23	3.6	5.2	6.4	6.3	4.4	5.3	61	13	1.1	.02	.01	.03
24	3.4	5.2	6.4	6.0	4.1	5.3	47	10	5.8	.01	.02	.03
25	3.2	5.2	6.4	4.7	3.4	6.0	40	7.8	7.0	.01	.05	.02
26	3.1	4.8	6.1	4.5	3.5	7.0	37	7.4	3.7	.01	.01	.03
27	2.7	4.7	5.8	4.3	3.8	38	31	7.0	2.1	.01	.00	.03
28	5.9	4.0	5.3	4.0	4.6	25	26	6.5	1.4	.03	.01	.01
29	51	3.8	4.8	3.5	---	11	28	6.4	1.1	.10	.01	.01
30	58	3.8	4.1	3.8	---	7.3	29	6.0	.85	.08	.02	.02
31	25	---	4.0	6.3	---	6.2	---	5.3	---	.03	.02	---
TOTAL	263.3	212.4	189.5	141.6	131.2	248.3	3945.8	526.4	85.49	4.47	.39	.63
MEAN	8.49	7.08	6.11	4.57	4.69	8.01	132	17.0	2.85	.14	.013	.021
MAX	58	16	11	6.4	6.6	38	2370	63	8.1	.82	.05	.04
MIN	1.8	3.8	3.2	3.5	3.4	4.8	4.0	5.3	.66	.01	.00	.01
CFSM	.04	.03	.03	.02	.02	.04	.61	.08	.01	.001	.000	.000
IN.	.04	.04	.03	.02	.02	.04	.67	.09	.01	.00	.00	.00
AC-FT	522	421	376	281	260	493	7830	1040	170	8.9	.8	1.2

CAL YR 1976	TOTAL	2072.78	MEAN	5.66	MAX	71	MIN	.11	CFSM	.03	IN	.35	AC-FT	4110
WTR YR 1977	TOTAL	5749.48	MEAN	15.8	MAX	2370	MIN	.00	CFSM	.07	IN	.98	AC-FT	11400

## COLORADO RIVER BASIN

08151500 LLANO RIVER AT LLANO, TX

LOCATION.--Lat 30°45'04", long 98°40'10", Llano County, Hydrologic Unit 12090204, on right bank in Llano, 0.4 mi (0.6 km) downstream from bridge on State Highway 16, 7 mi (11 km) upstream from Little Llano River, and 24.2 mi (38.9 km) upstream from mouth.

DRAINAGE AREA.--4,233 mi<sup>2</sup> (10,963 km<sup>2</sup>).

PERIOD OF RECORD.--September 1939 to current year.

REVISED RECORDS.--WSP 1342: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 970.01 ft (295.659 m) above mean sea level.

REMARKS.--Records good. Many small diversions above station. Part of low flow of Llano River disappears into various formations, many of which are faulted, between stations near Junction and Llano. National Weather Service gage-height telemeter at station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--38 years, 359 ft<sup>3</sup>/s (10.17 m<sup>3</sup>/s), 260,100 acre-ft/yr (321 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 232,000 ft<sup>3</sup>/s (6,570 m<sup>3</sup>/s) Sept. 10, 1952, gage height, 32.6 ft (9.94 m), from rating curve extended above 129,000 ft<sup>3</sup>/s (3,650 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow at times in 1952-56, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1879, 41.5 ft (12.65 m) June 14, 1935, discharge, 380,000 ft<sup>3</sup>/s (10,800 m<sup>3</sup>/s), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 7,500 ft<sup>3</sup>/s (212 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Apr. 16	0745	*67,500	1,910	18.66	5.688	May 11	1900	40,000	1,130	14.84	4.523

Minimum discharge, 118 ft<sup>3</sup>/s (3.34 m<sup>3</sup>/s) Sept. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	252	1150	275	267	323	312	351	1360	440	269	165	134
2	237	769	278	285	328	316	309	908	451	262	165	133
3	226	622	276	295	328	356	278	781	441	252	159	133
4	215	549	276	300	320	366	251	714	412	243	155	132
5	259	500	278	295	316	348	239	663	392	230	148	130
6	261	465	292	291	311	337	232	633	380	226	146	132
7	245	440	298	286	308	317	225	615	371	221	144	137
8	247	419	293	285	309	300	218	593	356	216	144	138
9	234	401	286	280	311	289	214	796	352	212	142	148
10	231	389	281	269	326	286	208	652	338	211	135	161
11	228	377	305	269	353	280	204	10200	324	203	133	158
12	216	361	320	292	354	268	201	8180	335	194	139	162
13	208	391	336	309	349	246	204	2050	528	191	139	155
14	203	395	347	319	341	243	260	1240	370	185	139	146
15	200	389	360	322	334	237	11800	974	331	185	150	138
16	219	369	371	308	332	232	41100	841	317	183	163	135
17	302	350	359	297	322	234	9980	775	301	181	153	134
18	266	345	337	285	319	235	5160	723	287	182	148	140
19	253	345	330	278	326	228	2470	686	275	183	146	150
20	232	344	316	278	330	221	2970	645	265	183	142	137
21	229	332	305	276	330	217	3630	769	261	181	139	133
22	225	319	294	286	334	212	2140	762	257	179	136	135
23	223	309	290	310	337	210	1410	701	277	178	136	133
24	222	308	286	337	337	212	1150	601	315	176	144	127
25	220	308	287	339	334	219	1000	554	338	170	182	125
26	213	303	284	324	330	234	899	525	791	164	163	127
27	210	295	283	309	322	717	822	505	475	161	143	127
28	242	282	278	298	319	760	764	487	364	165	140	123
29	476	276	277	293	---	886	1290	473	316	170	138	120
30	1640	275	275	297	---	591	3470	462	285	176	137	118
31	2180	---	271	309	---	426	---	447	---	172	134	---
TOTAL	10814	12377	9344	9188	9183	10335	93449	40315	10945	6104	4547	4101
MEAN	349	413	301	296	328	333	3115	1300	365	197	147	137
MAX	2180	1150	371	339	354	886	41100	10200	791	269	182	162
MIN	200	275	271	267	308	210	201	447	257	161	133	118
AC-FT	21450	24550	18530	18220	18210	20500	185400	79960	21710	12110	9020	8130
CAL YR 1976	TOTAL	125769	MEAN	344	MAX	9120	MIN	113	AC-FT	249500		
WTR YR 1977	TOTAL	220702	MEAN	605	MAX	41100	MIN	118	AC-FT	437800		



08152000 SANDY CREEK NEAR KINGSLAND, TX

LOCATION.--Lat 30°33'30", long 98°28'19", Llano County, Hydrologic Unit 12090201, on left bank at downstream side of bridge on State Highway 71, 3.9 mi (6.3 km) upstream from Lake Lyndon B. Johnson, and 7.3 mi (11.7 km) south of Kingsland.

DRAINAGE AREA.--327 mi<sup>2</sup> (847 km<sup>2</sup>).

PERIOD OF RECORD.--October 1966 to current year.

Water-quality records: Sediment records: January 1968 to September 1975.

GAGE.--Water-stage recorder. Datum of gage is 862.31 ft (262.832 m) above mean sea level.

REMARKS.--Records good. Some diversions above station for irrigation, amount unknown. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--11 years, 66.8 ft<sup>3</sup>/s (1.892 m<sup>3</sup>/s), 2.77 in/yr (70 mm/yr), 48,400 acre-ft/yr (59.7 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,200 ft<sup>3</sup>/s (600 m<sup>3</sup>/s) Apr. 15, 1977, gage height, 15.86 ft (4.834 m); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--The flood of Sept. 11, 1952, which was the highest since at least 1881, reached a stage of 34.2 ft (10.42 m), discharge 163,000 ft<sup>3</sup>/s (4,620 m<sup>3</sup>/s), from slope-area measurement at gage site.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 15	1300	*21,200 600	15.86 4.834	Apr. 20	0700	1,640 46.4	7.61 2.320
Apr. 16	1200	5,600 159	10.04 3.060				

Minimum discharge, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	76	26	33	43	28	26	86	34	7.4	.00	.10
2	24	59	25	35	47	26	26	74	55	7.0	.00	.15
3	23	48	23	37	52	47	25	65	39	7.0	.00	.11
4	21	42	23	37	50	50	22	63	33	6.5	.00	.06
5	29	37	30	37	45	41	19	63	32	6.5	.00	.07
6	23	33	39	37	43	35	18	58	32	6.1	.00	.31
7	22	30	35	37	40	32	18	57	53	6.1	.00	.26
8	25	27	33	37	39	30	17	54	43	5.7	.00	.50
9	23	25	31	37	39	30	17	103	36	4.7	.00	3.7
10	22	24	31	34	42	30	18	86	31	4.0	.00	5.2
11	20	23	308	33	56	30	17	60	29	4.9	.00	3.2
12	19	23	155	36	61	29	17	56	44	4.4	2.9	2.0
13	19	43	107	43	50	28	17	48	68	3.5	7.4	4.0
14	19	48	98	48	45	28	174	46	26	3.5	5.3	9.5
15	20	46	97	45	42	28	6670	46	19	3.0	3.6	7.4
16	26	38	86	41	39	28	3430	46	15	3.1	1.9	5.5
17	23	35	75	38	38	27	1340	48	12	2.7	1.1	3.5
18	21	32	70	35	35	28	676	49	10	2.0	.82	2.2
19	31	32	69	33	36	27	398	44	9.8	2.1	.72	1.5
20	39	33	66	32	34	26	907	40	9.3	1.8	.42	1.2
21	32	33	57	30	34	26	527	76	9.0	1.2	.37	.89
22	29	30	53	34	35	25	358	62	9.4	.71	.17	.72
23	28	28	52	43	34	24	215	46	11	.36	.05	.53
24	28	28	48	44	30	24	178	37	23	.11	.01	.26
25	26	28	48	46	29	26	147	34	12	.00	.11	.15
26	25	29	44	43	29	32	142	34	11	.00	.00	.06
27	23	29	42	39	28	103	125	37	9.3	.00	.00	.01
28	36	26	40	36	28	80	104	40	7.9	.00	.00	.00
29	263	26	37	33	---	47	86	37	7.9	.00	.00	.00
30	321	26	35	35	---	34	92	31	7.4	.12	.04	.00
31	127	---	33	40	---	27	---	33	---	.00	.05	---
TOTAL	1411	1037	1916	1168	1123	1076	15826	1659	738.0	94.50	24.96	53.08
MEAN	45.5	34.6	61.8	37.7	40.1	34.7	528	53.5	24.6	3.05	.81	1.77
MAX	321	76	308	48	61	103	6670	103	68	7.4	7.4	9.5
MIN	19	23	23	30	28	24	17	31	7.4	.00	.00	.00
CFSM	.14	.11	.19	.12	.12	.11	1.62	.16	.08	.009	.002	.005
IN.	.16	.12	.22	.13	.13	.12	1.80	.19	.08	.01	.00	.01
AC-FT	2800	2060	3800	2320	2230	2130	31390	3290	1460	187	50	105
CAL YR 1976	TOTAL	23106.30	MEAN 63.1	MAX 1790	MIN 3.7	CFSM .19	IN 2.63	AC-FT 45830				
WTR YR 1977	TOTAL	26126.54	MEAN 71.6	MAX 6670	MIN .00	CFSM .22	IN 2.97	AC-FT 51820				

## 08153500 PEDERNALES RIVER NEAR JOHNSON CITY, TX

LOCATION.--Lat 30°17'27", long 98°24'01", Blanco County, Hydrologic Unit 12090206, near center of span at downstream side of bridge on U.S. Highway 281, 0.2 mi (0.3 km) downstream from Towhead Creek, 1.1 mi (1.8 km) northeast of Johnson City, 3.4 mi (5.5 km) downstream from Buffalo Creek, and 48.2 mi (77.6 km) upstream from mouth.

DRAINAGE AREA.--947 mi<sup>2</sup> (2,453 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1939 to current year.

REVISED RECORDS.--WSP 1632: 1953(M), 1957, 1958(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,096.70 ft (334.274 m) above mean sea level. May 4 to Sept. 13, 1939, nonrecording gage, and Sept. 14, 1939, to Sept. 10, 1952, water-stage recorder at upstream side of bridge at same datum. Sept. 11, 1952, to June 29, 1953, nonrecording gage, and June 30, 1953, to Oct. 7, 1954, water-stage recorder at site 360 ft (110 m) downstream at same datum.

REMARKS.--Water-discharge records good. Some diversions above station for irrigation. During year, the city of Fredericksburg discharged 614 acre-ft (757,000 m<sup>3</sup>) of sewage effluent into the river. Records furnished by the city of Johnson City show that 175 acre-ft (216,000 m<sup>3</sup>) of water was diverted from pool at gage and 128 acre-ft (158,000 m<sup>3</sup>) of treated sewage effluent was returned to the river below gage.

AVERAGE DISCHARGE.--38 years (water years 1940-77), 174 ft<sup>3</sup>/s (4.928 m<sup>3</sup>/s), 126,100 acre-ft/yr (155 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 441,000 ft<sup>3</sup>/s (12,500 m<sup>3</sup>/s) Sept. 11, 1952, gage height, 42.5 ft (12.95 m), from floodmark, from rating curve extended above 116,000 ft<sup>3</sup>/s (3,290 m<sup>3</sup>/s) on basis of slope-area measurement of 441,000 ft<sup>3</sup>/s (12,500 m<sup>3</sup>/s); no flow at times in 1951-52, 1954, 1956-57, 1963-64, 1967-68, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1859, 42.5 ft (12.95 m) Sept. 11, 1952; flood of July 1869 reached a stage of 33 ft (10.1 m), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,100 ft<sup>3</sup>/s (116 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 15	1500	*98,000 2,780	22.60 6.888	Apr. 20	1100	4,230 120	12.03 3.667

Minimum daily discharge, 21 ft<sup>3</sup>/s (0.59 m<sup>3</sup>/s) Sept. 4, 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	99	172	96	115	184	139	118	536	556	104	33	23
2	86	143	94	133	196	140	118	497	734	100	33	23
3	80	128	95	142	194	139	113	475	299	96	32	22
4	75	119	96	142	186	156	105	465	232	90	40	21
5	72	114	111	133	171	148	97	439	202	88	43	21
6	72	108	135	133	161	135	94	417	184	84	34	30
7	75	102	138	142	159	130	91	409	181	80	27	32
8	72	102	127	133	160	127	88	386	177	76	27	30
9	76	97	115	133	171	124	87	388	167	72	27	36
10	72	100	115	133	183	128	87	921	157	70	26	35
11	72	96	252	125	211	115	87	578	151	65	24	44
12	69	95	266	142	226	113	87	621	147	63	27	32
13	64	130	214	214	198	113	94	428	233	58	27	36
14	64	133	202	214	182	113	1670	373	182	57	27	49
15	77	129	202	191	171	112	36400	360	156	56	25	36
16	103	120	191	160	167	111	13300	361	145	55	25	35
17	91	115	170	151	164	114	3120	361	134	56	24	32
18	86	115	170	142	160	112	1880	361	130	49	24	31
19	95	122	170	142	155	105	1470	346	124	49	24	29
20	112	120	160	142	153	102	2270	332	116	47	24	77
21	106	112	151	142	151	100	1820	412	113	45	24	71
22	90	106	151	150	159	98	1500	480	113	44	24	50
23	88	104	151	180	151	96	1120	336	136	42	24	39
24	89	104	151	189	147	99	971	288	296	40	23	35
25	81	107	142	167	144	105	867	262	234	40	25	32
26	80	114	142	157	142	115	794	247	161	38	23	31
27	80	103	142	150	140	198	728	234	136	35	27	31
28	92	91	133	143	137	314	667	226	122	35	25	28
29	292	96	133	137	---	178	623	226	113	35	24	27
30	426	95	125	145	---	141	589	226	106	35	24	27
31	245	---	115	164	---	125	---	220	---	35	23	---
TOTAL	3281	3392	4655	4686	4723	4045	71055	12211	5937	1839	839	1045
MEAN	106	113	150	151	169	130	2369	394	198	59.3	27.1	34.8
MAX	426	172	266	214	226	314	36400	921	734	104	43	77
MIN	64	91	94	115	137	96	87	220	106	35	23	21
AC-FT	6510	6730	9230	9290	9370	8020	140900	24220	11780	3650	1660	2070
CAL YR 1976	TOTAL	66512	MEAN 182	MAX 3230	MIN 39	AC-FT 131900						
WTR YR 1977	TOTAL	117708	MEAN 322	MAX 36400	MIN 21	AC-FT 233500						

COLORADO RIVER BASIN

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08153500 PEDERNALES RIVER NEAR JOHNSON CITY, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: April 1948 to September 1950, October 1971 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS-CHARGE (CFS)	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 27...	1805	87	703	8.3	15.0	290	53	47	42	39
DEC 09...	0830	122	715	8.2	9.0	310	58	56	42	36
JAN 18...	1103	148	688	8.1	4.5	300	44	56	39	30
MAR 02...	1405	119	650	8.3	14.5	260	42	38	39	35
MAY 13...	0912	93	707	7.9	20.0	260	30	43	38	40
JUN 06...	1245	167	586	8.0	24.5	240	23	42	32	28
JUL 07...	0915	75	678	7.7	29.0	260	41	36	40	41
AUG 17...	0920	23	772	7.7	29.0	270	49	39	42	50

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 27...	1.0	2.9	289	0	35	64	.3	9.0	382
DEC 09...	.9	2.6	310	0	35	60	.2	6.2	391
JAN 18...	.8	2.2	312	0	36	51	.4	7.6	376
MAR 02...	1.0	1.9	260	0	39	59	.4	3.8	344
MAY 13...	1.1	2.4	280	0	40	66	.4	3.3	371
JUN 06...	.8	2.3	260	0	32	43	.4	9.9	318
JUL 07...	1.1	2.7	260	0	38	67	.4	11	364
AUG 17...	1.3	3.3	270	0	44	89	.4	18	419

## 08154500 LAKE TRAVIS NEAR AUSTIN, TX

LOCATION.--Lat 30°23'29", long 97°54'24", Travis County, Hydrologic Unit 12090205, in powerhouse at Mansfield Dam on Colorado River, 7.3 mi (11.7 km) downstream from Sandy Creek, 12 mi (19 km) northwest of Austin, and at mile 318.0 (511.7 km).

DRAINAGE AREA.--38,130 mi<sup>2</sup> (98,760 km<sup>2</sup>), approximately, of which 12,880 mi<sup>2</sup> (33,360 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--September 1940 to current year. Prior to October 1948, published as Marshall Ford Reservoir near Austin.

REVISED RECORDS.--WSP 1342: Drainage area.

GAGE.--Nonrecording gage. Datum of gage is 0.12 ft (0.037 m) above mean sea level (levels by Bureau of Reclamation). Prior to Dec. 26, 1940, staff gages on left bank near dam, datum at mean sea level, unadjusted. Dec. 26, 1940, to February 1942, mercury manometer in powerhouse, datum at mean sea level, unadjusted.

REMARKS.--The lake is formed by a 7,098-foot-long (2,163 m) concrete gravity, earth, and rockfill dam. Storage began Sept. 9, 1940, and dam was completed in early 1942. Capacity curve is based on October 1939 survey. Capacity between gage heights 681.0 and 714.0 ft (207.57 and 217.63 m) is 778,000 acre-ft (959 hm<sup>3</sup>) and is reserved for flood control. Figures given herein represent total contents. Water is used for power development and for irrigation below Columbus. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam (roadway).....	750.1	-
Design flood.....	748.9	3,223,000
Crest of spillway.....	714.0	1,950,000
Top of power storage.....	681.0	1,172,000
Lowest gated outlet (invert).....	535.8	27,900

COOPERATION.--Records of daily gage heights and capacity curve furnished by Lower Colorado River Authority.

EXTREMES (at 2400) FOR PERIOD OF RECORD.--Maximum contents, 1,770,000 acre-ft (2.18 km<sup>3</sup>) May 18, 1957, gage height, 707.4 ft (215.62 m); minimum, 332,600 acre-ft (410 hm<sup>3</sup>) Aug. 13, 14, 1951, gage height, 614.2 ft (187.21 m).

EXTREMES (at 2400) FOR CURRENT YEAR.--Maximum contents, 1,404,000 acre-ft (1.73 km<sup>3</sup>) Apr. 17, gage height, 692.42 ft (211.050 m); minimum, 898,700 acre-ft (1.11 km<sup>3</sup>) Sept. 30, gage height, 664.92 ft (202.668 m).

Capacity table (gage height, in feet, and total contents, in acre-feet)

664.0	884,700	685.0	1,252,000
670.0	976,900	690.0	1,352,000
675.0	1,062,000	693.0	1,417,000
680.0	1,152,000		

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1047000	1095000	1158000	1154000	1154000	1156000	1175000	1374000	1262000	1137000	1062000	962000
2	1043000	1099000	1159000	1155000	1151000	1155000	1175000	1363000	1257000	1139000	1058000	957700
3	1039000	1106000	1161000	1157000	1152000	1156000	1175000	1359000	1252000	1135000	1057000	954100
4	1039000	1099000	1162000	1157000	1153000	1155000	1176000	1361000	1247000	1129000	1054000	949200
5	1043000	1110000	1164000	1156000	1154000	1154000	1171000	1361000	1241000	1126000	1051000	944800
6	1043000	1114000	1163000	1156000	1154000	1152000	1167000	1362000	1234000	1122000	1048000	940800
7	1047000	1118000	1160000	1155000	1157000	1151000	1163000	1356000	1226000	1120000	1044000	937100
8	1047000	1121000	1158000	1156000	1158000	1148000	1160000	1354000	1220000	1116000	1043000	933500
9	1046000	1125000	1156000	1153000	1159000	1150000	1157000	1353000	1214000	1114000	1041000	928500
10	1046000	1130000	1158000	1152000	1159000	1152000	1154000	1352000	1207000	1110000	1038000	925400
11	1048000	1134000	1160000	1152000	1161000	1155000	1150000	1352000	1202000	1108000	1037000	925800
12	1048000	1139000	1158000	1149000	1158000	1157000	1147000	1364000	1196000	1105000	1035000	922800
13	1048000	1143000	1159000	1152000	1156000	1158000	1147000	1366000	1197000	1103000	1031000	919900
14	1048000	1146000	1157000	1153000	1154000	1161000	1153000	1366000	1192000	1100000	1028000	918200
15	1050000	1148000	1155000	1154000	1154000	1161000	1320000	1364000	1188000	1098000	1024000	916300
16	1050000	1149000	1155000	1154000	1154000	1159000	1401000	1363000	1184000	1095000	1022000	913700
17	1050000	1151000	1152000	1155000	1155000	1158000	1404000	1359000	1179000	1092000	1017000	913100
18	1050000	1151000	1155000	1154000	1156000	1156000	1403000	1356000	1175000	1090000	1014000	911500
19	1055000	1153000	1155000	1154000	1157000	1154000	1390000	1355000	1168000	1089000	1010000	911900
20	1056000	1153000	1155000	1153000	1158000	1153000	1383000	1351000	1165000	1093000	1006000	909500
21	1057000	1154000	1152000	1153000	1158000	1152000	1391000	1350000	1159000	1092000	1002000	907400
22	1059000	1158000	1152000	1154000	1157000	1150000	1380000	1348000	1154000	1089000	997500	905200
23	1059000	1159000	1152000	1158000	1159000	1149000	1370000	1343000	1153000	1088000	996100	903700
24	1061000	1159000	1151000	1157000	1157000	1151000	1369000	1327000	1152000	1086000	992500	902600
25	1063000	1163000	1152000	1157000	1157000	1152000	1370000	1307000	1151000	1084000	987800	901100
26	1064000	1167000	1153000	1156000	1156000	1155000	1370000	1297000	1149000	1081000	983500	902800
27	1068000	1167000	1152000	1157000	1155000	1161000	1370000	1289000	1148000	1078000	981700	904600
28	1070000	1165000	1153000	1155000	1155000	1163000	1372000	1283000	1146000	1076000	978300	903400
29	1077000	1164000	1153000	1154000	---	1166000	1373000	1278000	1144000	1072000	974400	901100
30	1082000	1162000	1155000	1155000	---	1169000	1375000	1272000	1140000	1068000	970100	898700
31	1087000	---	1155000	1155000	---	1174000	---	1267000	---	1065000	966100	---
(†)	676.38	680.52	680.14	680.13	680.14	681.12	691.09	685.75	679.34	675.16	669.30	664.92
(*)	+36000	+75000	-7000	0	0	+19000	+201000	-108000	-127000	-75000	-98900	-67400
MAX	1087000	1167000	1164000	1158000	1161000	1174000	1404000	1374000	1262000	1139000	1062000	962000
MIN	1039000	1095000	1151000	1149000	1151000	1148000	1147000	1267000	1140000	1065000	966100	898700

CAL YR 1976 MAX 1233000 MIN 1039000 \* +74000  
WTR YR 1977 MAX 1404000 MIN 898700 \* -152300

† Gage height, in feet, at end of month.

\* Change in contents, in acre-feet.

## COLORADO RIVER BASIN

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## 08154510 COLORADO RIVER BELOW MANSFIELD DAM, AUSTIN, TX

LOCATION.--Lat 30°23'30", long 97°54'28". Travis County, Hydrologic Unit 12090205, at the downstream side of Mansfield Dam, 12.9 mi (20.8 km) northwest of the State Capitol at Austin, and at mile 318.0 (511.7 km).

DRAINAGE AREA.--38,130 mi<sup>2</sup> (98,760 km<sup>2</sup>), approximately of which 12,880 mi<sup>2</sup> (33,360 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--None. Daily discharge record is based on daily releases from Lake Travis.

REMARKS.--Records fair.

COOPERATION.--All records of releases were furnished by the Lower Colorado River Authority.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 25,300 ft<sup>3</sup>/s (716 m<sup>3</sup>/s) Apr. 17-19, 1977; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 25,300 ft<sup>3</sup>/s (716 m<sup>3</sup>/s) Apr. 17-19; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2210	.00	2180	792	2770	1510	3260	20300	5530	2290	1450	1950
2	1980	.00	.00	1540	1700	1070	3180	20300	5530	2360	1520	2180
3	2250	.00	.00	1960	666	1230	3080	9240	5530	2260	1430	1910
4	1550	.00	.00	696	211	1380	3080	5440	5500	2240	2050	2380
5	503	.00	.00	842	126	1260	3400	5440	5340	1930	1790	2190
6	.00	.00	1360	1810	126	1160	3140	5290	5370	2040	1780	1940
7	.00	.00	1520	380	126	1370	2840	5440	5530	1640	1900	1920
8	.00	.00	937	210	795	1290	1550	5440	5530	1860	2030	1900
9	174	.00	1590	1720	940	487	1570	5440	5530	1360	1920	2260
10	.00	.00	954	2550	1430	499	1580	5440	3960	1580	1690	2230
11	.00	.00	940	2520	1960	581	1820	5440	3030	1730	1280	2120
12	.00	.00	896	1370	1900	482	1740	5440	3030	1480	1680	2300
13	.00	515	918	322	1540	526	1660	5440	2990	1760	2350	1190
14	172	.00	1760	367	1980	672	1580	5440	3030	1360	1850	1020
15	.00	333	1810	364	1980	756	8490	5440	3180	1350	2280	1060
16	.00	.00	809	342	1860	669	25200	5440	3030	1320	2000	1070
17	.00	249	1840	2570	1520	910	25300	5440	3030	1590	2160	1160
18	180	.00	.00	2480	189	913	25300	5440	3030	1580	1890	1120
19	.00	.00	1180	2910	126	904	25300	5440	3030	1070	2130	983
20	.00	.00	1100	1050	126	513	9200	5440	2760	2040	1870	940
21	.00	.00	1350	178	126	915	8140	5440	2610	1140	2160	900
22	.00	924	414	255	946	966	15300	5440	2460	863	2020	966
23	.00	1770	266	249	932	484	12800	5440	1970	813	2030	821
24	.00	1850	311	225	789	779	8650	9640	2110	862	1910	805
25	.00	659	.00	461	365	806	5440	12400	2350	1100	2320	958
26	.00	855	.00	982	905	770	5440	7480	2060	1080	1920	1580
27	.00	2230	330	998	1150	2080	5440	5500	2280	1220	2230	1060
28	.00	3090	241	981	1180	3270	5370	5530	2110	1230	1850	782
29	.00	3540	512	638	---	2920	5440	5530	2440	1540	2090	1010
30	.00	3090	.00	946	---	2960	12100	5530	2040	1390	2010	1310
31	.00	---	939	1990	---	2930	---	5530	---	1590	1880	---
TOTAL	9019.00	19105.00	24157.00	34698	28464	37062	236390	215630	105920	47668	59470	44015
MEAN	291	637	779	1119	1017	1196	7880	6956	3531	1538	1918	1467
MAX	2250	3540	2180	2910	2770	3270	25300	20300	5530	2360	2350	2380
MIN	.00	.00	.00	178	126	482	1550	5290	1970	813	1280	782
AC-FT	17890	37890	47920	68820	56460	73510	468900	427700	210100	94550	118000	87300
CAL YR 1976	TOTAL	448051.00	MEAN	1224	MAX	5090	MIN	.00	AC-FT	888700		
WTR YR 1977	TOTAL	861598.00	MEAN	2361	MAX	25300	MIN	.00	AC-FT	1709000		



## COLORADO RIVER BASIN

08154760 BULL CREEK AT FARM ROAD 2222 NEAR AUSTIN, TX  
(Reconnaissance partial-record station)

LOCATION.--Lat 30°21'33", long 97°47'16". Travis County, Hydrologic Unit 12090205, low-water crossing at Farm Road 2222, 50 ft (15 m) west of Lakewood Drive, and 6.5 mi (10.5 km) northwest of State capitol in Austin.

DRAINAGE AREA.--30.42 mi<sup>2</sup> (78.79 km<sup>2</sup>).

PERIOD OF RECORD.--Occasional discharge measurements and water-quality data: January 1975 to current year.

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM PER 100 ML	FECAL COLIFORM 7UM-MF (COL./100 ML)
NOV 02...	0835	1.1	661	8.1	13.0	0	2	10.0	98	.3	2000	58
JAN 03...	0900	1.8	588	8.4	5.0	5	1	12.2	98	.3	590	20
MAR 01...	1050	1.9	537	8.2	12.0	5	1	10.1	97	.4	2000	9
APR 15...	0930	8.0	292	8.0	16.5	0	380	9.4	99	3.0	39000	4300
MAY 16...	1117	5.1	515	8.1	22.0	5	10	8.6	101	.6	12000	80
JUL 11...	0835	.18	523	8.0	26.0	5	20	7.3	91	1.4	7200	33
SEP 21...	1045	7.6	387	7.8	24.5	10	25	7.6	93	1.2	32000	1100

DATE	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV 02...	130	280	54	73	23	34	.9	1.9	272	0	65	42
JAN 03...	40	--	--	--	--	--	--	--	--	--	--	--
MAR 01...	24	--	--	--	--	--	--	--	--	--	--	--
APR 15...	33000	150	38	42	10	4.8	.2	1.8	132	0	30	7.3
MAY 16...	500	--	--	--	--	--	--	--	--	--	--	--
JUL 11...	240	--	--	--	--	--	--	--	--	--	--	--
SEP 21...	560	180	69	52	11	9.7	.3	2.8	130	0	67	16

DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
NOV 02...	.2	9.2	383	3	1	.21	.00	.00	.24	.01	5.6
JAN 03...	--	--	--	2	1	.22	.00	.01	.10	.00	3.4
MAR 01...	--	--	--	3	1	.18	.00	.01	.25	.00	2.2
APR 15...	.1	5.8	167	654	116	.23	.01	.06	.93	.12	12
MAY 16...	--	--	--	14	1	.10	.00	.01	.52	.01	4.9
JUL 11...	--	--	--	25	3	.03	.01	.05	.48	.02	3.4
SEP 21...	.2	8.3	231	23	4	.30	.01	.00	.08	.05	6.6

COLORADO RIVER BASIN

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08154760 BULL CREEK AT FARM ROAD 2222 NEAR AUSTIN, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
NOV 02...	0835	0	100	0	0	0	10
APR 15...	0930	1	0	0	1	0	10
SEP 21...	1045	1	100	0	0	2	20

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
NOV 02...	0	0	.2	0	0	10
APR 15...	0	10	.0	0	0	10
SEP 21...	0	0	.0	0	0	10

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
NOV 02...	0835	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
APR 15...	0930	.0	.00	.00	.0	.00	.00	.00	.02	.00	.00	.00
MAY 16...	1117	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
SEP 21...	1045	.0	.00	.00	.0	.00	.00	.00	.33	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 02...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
APR 15...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
MAY 16...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
SEP 21...	.00	.00	.01	.00	.00	.00	.00	0	.00	.00	.01	.00

## COLORADO RIVER BASIN

08154900 LAKE AUSTIN AT AUSTIN, TX

LOCATION.--Lat 30°18'53", long 97°47'10", Travis County, Hydrologic Unit 12090205, at city of Austin Waterplant No. 2 and 1.5 mi (2.4 km) upstream from Tom Miller Dam on the Colorado River at Austin.

DRAINAGE AREA.--38,240 mi<sup>2</sup> (99,040 km<sup>2</sup>), of which 11,900 mi<sup>2</sup> (30,800 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--Chemical analyses: October 1964 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1964 to current year.

WATER TEMPERATURES: October 1964 to current year.

REMARKS.--No water-discharge records available.

## EXTREMES FOR PERIOD OF DAILY RECORDS.--

SPECIFIC CONDUCTANCE (1964-75): Maximum daily, 982 micromhos Aug. 15-17, 1974; minimum daily, 311 micromhos June 19, 1968.

WATER TEMPERATURES (1964-75): Maximum daily, 32.0°C Aug. 24, 1965; minimum daily, 9.0°C Jan. 30, 1966, Jan. 9, 11, 1968, and Jan. 5, 1969.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)
OCT 18...	1410	526	8.1	21.5	210	51	46	23	29
JAN 14...	1325	546	8.4	9.5	200	44	42	24	32
FEB 15...	1345	542	8.6	12.0	210	48	47	22	45
MAR 17...	1325	561	8.2	17.0	210	48	47	23	33
MAY 16...	1340	498	8.0	20.0	180	37	41	20	27
JUN 16...	1330	485	7.9	23.0	180	40	42	18	27
JUL 19...	1355	507	7.7	25.0	210	60	52	19	28
AUG 16...	1350	528	7.8	25.0	200	51	45	21	29
SEP 16...	1430	551	7.9	25.0	200	44	47	20	32
DATE	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)
OCT 18...	.9	3.2	193	0	32	50	.2	10	289
JAN 14...	1.0	3.6	186	4	37	57	.2	8.7	300
FEB 15...	1.4	3.2	181	7	39	77	.3	7.8	338
MAR 17...	1.0	3.2	200	0	39	58	.2	7.1	309
MAY 16...	.9	3.3	180	0	33	46	.2	8.1	267
JUN 16...	.9	3.4	170	0	34	51	.2	8.3	268
JUL 19...	.8	3.3	180	0	39	56	.4	9.3	296
AUG 16...	.9	3.5	180	0	38	57	.2	10	292
SEP 16...	1.0	3.5	190	0	37	58	.2	9.9	301

08154900 LAKE AUSTIN AT AUSTIN, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	516	508	---	---	531	524	---	---	495	484	509	538
2	520	---	525	---	---	555	557	533	---	486	---	538
3	514	---	535	---	514	526	557	531	---	491	511	538
4	516	509	536	550	509	550	554	525	487	---	---	539
5	---	512	540	---	519	500	557	516	484	496	532	543
6	---	520	537	551	511	---	---	---	495	---	---	---
7	516	510	514	---	526	547	550	516	484	---	---	---
8	519	512	---	544	521	558	---	---	488	489	515	547
9	520	---	537	535	528	---	521	507	486	---	518	---
10	---	510	532	546	531	---	554	---	---	---	518	547
11	519	512	518	---	511	552	557	---	489	---	518	544
12	---	513	509	543	---	552	557	---	489	---	---	529
13	516	511	532	539	---	---	498	---	487	---	521	---
14	516	505	533	539	---	552	544	---	486	---	522	540
15	519	518	---	---	---	552	557	492	---	---	527	550
16	514	515	---	540	---	552	531	500	486	---	---	---
17	519	515	---	537	554	558	544	---	486	---	522	546
18	520	515	---	538	557	555	537	498	486	500	529	543
19	---	519	---	---	---	---	544	495	---	503	530	542
20	---	---	---	542	554	---	531	485	482	499	527	---
21	519	515	---	538	531	552	544	486	482	---	---	544
22	526	---	---	538	538	---	544	---	487	---	529	546
23	---	---	---	543	---	---	---	495	484	---	529	---
24	530	520	---	542	549	558	---	495	485	---	531	544
25	520	---	---	---	556	552	---	495	485	501	---	542
26	519	508	---	---	538	558	554	488	486	507	532	542
27	521	515	---	544	---	562	544	495	488	511	531	543
28	---	---	546	539	556	552	544	495	487	508	531	546
29	520	532	---	532	---	---	544	495	485	510	533	---
30	520	532	538	533	---	---	---	490	489	---	---	550
31	521	---	---	546	---	550	---	---	---	---	537	---
MEAN	519	515	531	541	533	548	545	502	487	499	525	543

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24.0	16.5	---	---	10.0	13.5	---	---	19.5	24.0	25.5	24.5
2	24.0	---	13.0	---	---	14.5	14.0	16.0	---	23.5	---	24.5
3	24.0	---	10.0	---	9.5	14.0	15.0	15.5	---	23.5	25.0	24.5
4	20.0	---	13.0	9.0	9.5	13.5	15.0	18.5	19.5	---	---	24.5
5	---	16.5	12.0	---	9.5	13.5	14.0	18.5	20.0	24.0	26.0	24.5
6	---	16.5	13.0	9.5	9.5	---	---	---	20.5	---	---	---
7	23.5	17.0	13.0	---	10.5	13.0	14.5	19.0	19.5	---	---	---
8	23.5	16.5	---	9.5	10.0	13.5	---	---	19.5	23.5	25.5	24.0
9	23.0	---	---	9.5	10.0	---	14.5	19.0	20.0	---	24.0	---
10	---	17.0	13.0	9.5	10.0	---	14.5	---	---	---	23.5	24.0
11	22.0	17.0	13.0	---	10.0	13.5	14.5	---	21.0	---	24.5	24.0
12	---	16.5	13.0	10.5	---	14.0	15.0	---	21.0	---	---	24.0
13	21.5	15.0	13.0	10.0	---	---	16.5	---	21.0	---	26.5	---
14	22.0	14.5	13.0	10.0	---	14.5	15.0	---	20.5	---	26.5	25.0
15	22.0	14.0	---	---	---	16.0	14.5	19.0	---	---	25.5	24.5
16	21.0	14.0	---	9.5	---	15.5	16.5	18.5	21.0	---	---	---
17	21.5	13.5	---	9.0	11.0	16.0	14.0	---	21.5	---	25.5	24.0
18	21.5	13.0	---	9.5	11.5	16.0	15.0	18.0	21.5	25.5	25.5	23.5
19	---	13.0	---	---	---	---	15.5	18.0	---	24.5	23.5	23.5
20	---	---	---	9.0	13.0	---	15.5	18.5	22.0	24.0	24.5	---
21	20.0	14.0	---	9.5	13.0	11.0	14.0	18.5	23.0	---	---	26.0
22	16.5	---	---	9.0	13.5	---	15.0	---	21.0	---	25.5	24.0
23	---	---	---	10.0	---	---	---	19.0	23.0	---	25.0	---
24	19.5	14.0	---	10.0	13.5	15.5	---	19.0	23.0	---	25.5	24.5
25	19.0	---	---	---	14.0	16.5	---	19.5	23.0	25.0	---	23.5
26	19.5	13.0	---	---	13.5	16.5	15.0	18.5	23.0	25.5	25.5	26.5
27	18.5	14.5	---	10.5	---	16.5	15.5	18.5	21.0	25.5	26.0	27.0
28	---	---	13.0	10.5	13.5	16.5	16.5	19.5	23.5	25.0	24.5	27.0
29	18.5	18.0	---	10.5	---	---	18.0	19.5	24.0	25.5	26.0	---
30	16.5	13.5	12.0	10.0	---	---	---	19.0	22.0	---	---	26.5
31	18.0	---	---	9.0	---	15.0	---	---	---	---	25.0	---
MEAN	21.0	15.0	12.5	9.5	11.5	14.5	15.0	18.5	21.5	24.5	25.0	24.5

## COLORADO RIVER BASIN

08155300 BARTON CREEK AT LOOP 360, AUSTIN, TX

LOCATION.--Lat 30°14'40", long 97°48'07", Travis County, Hydrologic Unit 12090205, on Loop 360, 0.9 mi (1.4 km) west of the intersection of Ben White and Lamar Boulevards, and 4.3 mi (6.9 km) southwest of the State Capitol Building in Austin.

DRAINAGE AREA.--116 mi<sup>2</sup> (300 km<sup>2</sup>).

PERIOD OF RECORD.--June 1975 to January 1977 (periodic gage heights and discharge measurements only), February to September 1977.

GAGE.--Water-stage recorder. Datum of gage is 510.32 (155.546 m) above mean sea level (Texas Department of Highways and Public Transportation bench mark).

REMARKS.--Records fair above 10 ft<sup>3</sup>/s (0.28 m<sup>3</sup>/s) and poor below. No known regulation or diversions. There are two recording rain gages located in the watershed.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,270 ft<sup>3</sup>/s (92.6 m<sup>3</sup>/s) Apr. 15, 1977, gage height, 7.67 ft (2.338 m); no flow for many days each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--The flood of May 28, 1929, was probably the highest since that date, discharge 39,400 ft<sup>3</sup>/s (1,120 m<sup>3</sup>/s), based on a slope-area measurement of peak flow at a site about 2 mi (3 km) upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period February to September 1977, 3,270 ft<sup>3</sup>/s (92.6 m<sup>3</sup>/s) Apr. 15, gage height, 7.67 ft (2.338 m); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, FEBRUARY TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					46	54	11	156	15	.00	.00	.00
2					45	53	11	136	15	.00	.00	.00
3					45	55	10	126	11	.00	.00	.00
4					44	59	8.6	117	7.8	.00	.00	.00
5					44	53	7.0	107	5.9	.00	.00	.00
6					42	47	5.5	100	4.4	.00	.00	.00
7					42	44	4.0	91	2.9	.00	.00	.00
8					42	42	2.5	84	1.4	.00	.00	.00
9					41	41	1.0	78	.60	.00	.00	.00
10					44	40	.50	72	.00	.00	.00	.00
11					149	38	.00	66	.00	.00	.00	.00
12					265	34	.00	62	.00	.00	.00	.00
13					184	31	6.0	57	.00	.00	.00	.00
14					164	29	19	53	.00	.00	.00	.00
15					145	28	1650	48	.00	.00	.00	.00
16					134	26	2000	43	.00	.00	.00	.00
17					125	24	1020	41	.00	.00	.00	.00
18					117	24	596	41	.00	.00	.00	.00
19					108	22	444	41	.00	.00	.00	.00
20					100	20	852	39	.00	.00	.00	.00
21					95	19	608	44	.00	.00	.00	.00
22					92	17	450	42	.00	.00	.00	.00
23					85	16	354	33	.00	.00	.00	.00
24					75	16	300	28	.00	.00	.00	.00
25					71	16	259	24	.00	.00	.00	.00
26					67	17	222	21	.00	.00	.00	.00
27					60	21	192	18	.00	.00	.00	.00
28					58	23	172	16	.00	.00	.00	.00
29					---	23	157	15	.00	.00	.00	.00
30					---	16	213	14	.00	.00	.00	.00
31					---	12	---	14	---	.00	.00	---
TOTAL					2529	960	9575.10	1827	64.00	.00	.00	.00
MEAN					90.3	31.0	319	58.9	2.13	.000	.000	.000
MAX					265	59	2000	156	15	.00	.00	.00
MIN					41	12	.00	14	.00	.00	.00	.00
CFSM					.78	.27	2.75	.51	.02	.000	.000	.000
IN.					.81	.31	3.07	.59	.02	.00	.00	.00
AC-FT					5020	1900	18990	3620	127	.00	.00	.00
(††)					2.34	1.47	8.56	1.31	2.15	.03	.16	2.52

WTR YR 1977 TOTAL - MEAN - MAX - MIN - CFSM - IN - AC-FT - †† -

†† Weighted-mean rainfall, in inches, based on two rain gages.



## COLORADO RIVER BASIN

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08155505 BARTON CREEK BELOW BARTON SPRINGS AT AUSTIN, TX  
(Reconnaissance partial-record station)

LOCATION.--Lat 30°15'50", long 97°46'03", Travis County, Hydrologic Unit 12090205, 800 ft (240 m) upstream from bridge on Barton Springs Road and 1.8 mi (2.9 km) southwest of State Capitol at Austin.

DRAINAGE AREA.--125.3 mi<sup>2</sup> (324.5 km<sup>2</sup>).

PERIOD OF RECORD.--Occasional discharge measurements and water-quality data: January 1975 to current year.

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL./100 ML)
NOV 03...	1403	97	581	7.2	21.0	0	0	8.0	92	0	300	58
JAN 04...	1100	98	582	7.2	7.5	0	0	9.4	81	.2	1500	270
MAR 02...	1315	147	478	7.8	16.0	0	1	8.9	93	.4	490	3
APR 15...	1215	807	286	7.5	17.5	20	200	8.2	88	3.2	22000	4900
15...	1330	1080	290	7.6	17.5	20	280	8.1	87	3.1	34000	8100
18...	1310	688	491	7.9	19.5	0	3	9.1	102	.8	4400	150
MAY 18...	1250	144	502	7.6	22.5	0	0	7.8	92	.3	2800	38
JUL 12...	1005	95	602	7.2	22.0	0	0	7.3	86	.2	2600	88
SEP 22...	1045	72	622	7.3	21.5	0	0	7.8	91	.0	3500	54
DATE	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV 03...	31	290	35	85	20	11	.3	1.2	316	0	18	17
JAN 04...	110	--	--	--	--	--	--	--	--	--	--	--
MAR 02...	34	--	--	--	--	--	--	--	--	--	--	--
APR 15...	41000	--	--	--	--	--	--	--	--	--	--	--
15...	42000	140	12	41	9.1	4.9	.2	2.4	156	0	11	8.3
18...	840	--	--	--	--	--	--	--	--	--	--	--
MAY 18...	140	250	25	68	19	8.9	.2	1.0	272	0	20	15
JUL 12...	110	--	--	--	--	--	--	--	--	--	--	--
SEP 22...	320	300	30	84	22	14	.4	1.3	330	0	22	32
DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	
NOV 03...	.2	9.8	318	1	0	1.3	.00	.01	.09	.01	5.2	
JAN 04...	--	--	--	1	1	.83	.00	.01	.03	.01	2.2	
MAR 02...	--	--	--	1	1	.38	.00	.01	.10	.00	1.6	
APR 15...	--	--	--	308	38	.38	.01	.04	1.1	.09	8.5	
15...	.1	7.3	161	440	68	.37	.01	.04	1.3	.12	15	
18...	--	--	--	4	0	.37	.00	.01	.23	.01	5.2	
MAY 18...	.2	8.9	275	0	0	.68	.00	.01	.21	.01	1.7	
JUL 12...	--	--	--	0	0	1.7	.01	.00	.03	.00	1.4	
SEP 22...	.2	12	350	0	0	.74	.00	.00	.03	.01	1.7	

## COLORADO RIVER BASIN

08155505 BARTON CREEK BELOW BARTON SPRINGS AT AUSTIN, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
NOV 03...	1403	0	100	0	0	0	0
APR 15...	1330	1	0	0	4	0	20
MAY 18...	1250	0	0	0	0	0	0
SEP 22...	1045	0	200	0	0	0	20

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
NOV 03...	0	0	.2	0	0	10
APR 15...	0	10	.0	0	0	0
MAY 18...	0	0	.0	0	0	5
SEP 22...	0	1	.0	1	0	0

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
NOV 03...	1403	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
APR 15...	1330	.0	.00	.00	.0	.00	.00	.00	.01	.00	.00	.00
MAY 18...	1250	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
SEP 22...	1045	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 03...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
APR 15...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
MAY 18...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
SEP 22...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

## 08156700 SHOAL CREEK AT NORTHWEST PARK, AUSTIN, TX

LOCATION.--Lat 30°20'50", long 97°44'41", Travis County, Hydrologic Unit 12090205, at Northwest Park in Austin, 400 ft (122 m) upstream from Shoal Creek Boulevard bridge, 0.5 mi (0.8 km) west of intersection of Burnet Road and Justin Lane, and 5.0 mi (8.0 km) north of State Capitol Building in Austin.

DRAINAGE AREA.--7.03 mi<sup>2</sup> (18.21 km<sup>2</sup>).

PERIOD OF RECORD.--March 1975 to current year.

GAGE.--Water-stage recorder. Datum of gage is 661.34 ft (201.576 m), revised, above mean sea level (city of Austin bench mark).

REMARKS.--Records good. The city of Austin diverts water into the channel above gage during the summer months from a swimming pool at Northwest Park. There is some diversion into and out of the drainage area by storm sewers. This station is part of a hydrologic project to study the rainfall-runoff relationship for the Austin urban area. There are two digital recording rain gages located in the watershed. Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,620 ft<sup>3</sup>/s (45.9 m<sup>3</sup>/s) Apr. 28, 1976, gage height, 7.50 ft (2.286 m); no flow for many days each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum flood since 1885, occurred Apr. 22, 1915, stage and discharge unknown.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 580 ft<sup>3</sup>/s (16.4 m<sup>3</sup>/s) Apr. 15, gage height, 5.38 ft (1.640 m), no other peak above base of 500 ft<sup>3</sup>/s (14.2 m<sup>3</sup>/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.19	.82	.25	.43	1.7	.45	.60	.32	.27	.07	.00	.00
2	.19	.25	.25	1.5	2.7	.56	.75	.27	.13	.06	.00	.00
3	.18	.23	.25	.62	1.9	17	.65	.32	.11	.06	.00	.00
4	9.6	.25	.25	.53	.49	.36	1.4	.38	.10	.04	.00	.00
5	7.0	.23	7.4	.47	.46	.25	.69	.56	.11	.06	.00	.00
6	.30	.19	2.0	.79	.45	.27	.64	.70	.11	.03	.00	.00
7	.51	.17	.37	.44	.44	.27	.60	.50	.08	.04	.00	.00
8	.42	.17	.32	.79	.68	.25	.56	.51	.06	.04	.00	.00
9	.23	.16	.93	1.6	.42	.25	.60	1.1	.08	.04	.00	.02
10	.21	.15	20	.53	15	.25	.64	1.1	.08	.03	.00	.01
11	.19	.12	21	.51	45	.24	.64	.38	.11	.03	.00	.00
12	.17	1.7	3.0	1.5	2.9	.25	.90	.29	.10	.02	.00	3.4
13	.16	5.8	1.1	9.5	1.2	.30	5.0	.23	.12	.02	.00	17
14	.19	.15	1.1	.91	.69	.24	.81	.23	.08	.03	.00	.42
15	12	.11	.77	.80	.60	.23	72	.23	.48	.03	.00	.07
16	1.6	.10	.65	.94	.48	.64	43	.27	.13	.04	.00	.05
17	.25	.18	.60	1.0	.45	.95	2.6	.48	.08	.95	.00	.04
18	.19	.12	.57	1.1	.39	.90	1.1	.22	.08	.16	.00	.03
19	10	9.3	1.5	1.3	.39	1.3	22	.62	.07	.07	.00	32
20	.36	.27	.74	1.5	.36	1.2	29	1.1	.07	.04	.00	.70
21	.22	.25	.72	1.5	.36	.83	2.5	14	.84	.05	.00	.09
22	.21	.25	.60	10	.36	.91	1.1	.24	.19	.04	.00	.06
23	1.8	.27	.60	2.3	.34	.69	.64	1.3	3.9	.02	.00	.05
24	10	.28	.55	.83	.36	.93	.51	.15	.23	.03	.00	.03
25	.44	6.8	.50	.77	.42	1.0	.43	.07	.11	.01	.00	.02
26	.29	.76	.46	.67	.39	4.3	.37	.09	.09	.00	.00	.02
27	.31	.22	.45	.62	.36	5.2	.32	.12	.07	.00	.27	.00
28	5.0	.36	.44	.53	.39	1.2	.28	.13	.08	.00	.07	.00
29	87	.26	.53	.56	---	.34	3.2	.13	.07	.00	.01	.00
30	1.1	.25	.42	2.1	---	.38	4.6	.12	.07	.00	.01	.00
31	.37	---	.42	.65	---	.49	---	.21	---	.00	.00	---
TOTAL	150.68	30.17	68.74	47.29	79.68	42.43	198.13	26.37	8.10	2.01	.36	54.01
MEAN	4.86	1.01	2.22	1.53	2.85	1.37	6.60	.85	.27	.065	.012	1.80
MAX	87	9.3	21	10	45	17	72	14	3.9	.95	.27	32
MIN	.16	.10	.25	.43	.34	.23	.28	.07	.06	.00	.00	.00
CFSM	.69	.14	.32	.22	.41	.20	.94	.12	.04	.009	.002	.26
IN.	.80	.16	.36	.25	.42	.22	1.05	.14	.04	.01	.00	.29
AC-FT	299	60	136	94	158	84	393	52	16	4.0	.7	107
(††)	5.81	1.79	2.41	1.90	2.51	1.82	6.61	1.31	.82	.26	.25	2.83

CAL YR 1976 TOTAL 1087.90 MEAN 2.97 MAX 205 MIN .00 CFSM .42 IN 5.76 AC-FT 2160 †† 38.65  
WTR YR 1977 TOTAL 707.97 MEAN 1.94 MAX 87 MIN .00 CFSM .28 IN 3.75 AC-FT 1400 †† 28.32

†† Weighted-mean rainfall, in inches, based on two rain gages.

## COLORADO RIVER BASIN

08156800 SHOAL CREEK AT 12TH STREET, AUSTIN, TX  
(Flood-hydrograph partial-record station)

LOCATION.--Lat 30°16'35", long 97°45'00", Travis County, Hydrologic Unit 12090205, at downstream side of bridge on 12th Street and 0.6 mi (1.0 km) west of the State Capitol Building in Austin.

DRAINAGE AREA (revised).--12.8 mi<sup>2</sup> (33.2 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1975 to current year. Periodic discharge measurements only: November 1974 to current year.

GAGE.--Flood-hydrograph recorder and crest-stage gage. Datum of gage is 455.33 ft (138.785 m) above mean sea level.

REMARKS.--Additional storm rainfall-runoff data for this site can be obtained from the report "Hydrologic Data for Urban Studies in the Austin, Texas Metropolitan Area, 1977."

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,800 ft<sup>3</sup>/s (136 m<sup>3</sup>/s) Nov. 23, 1974, gage height, 15.0 ft (4.57 m), from slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 999 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s) Apr. 15, gage height, 8.50 ft (2.591 m), no peak above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s).

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1975 to current year. Water temperatures: January 1975 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL./100 ML)	FECAL COLIFORM (COL./100 ML)
DATE	TIME											
NOV 02...	0940	4.0	707	7.8	12.0	0	1	9.6	92	.1	8800	2200
JAN 03...	0930	4.3	661	8.0	4.0	5	5	11.8	93	1.2	16000	1500
FEB 11...	0845	322	178	8.1	13.0	50	600	9.9	97	13	45000	4400
11...	1515	92	318	7.8	15.5	20	150	9.3	96	6.2	480000	100000
12...	0755	22	660	8.0	12.0	5	2	9.2	88	1.1	100000	42000
14...	0855	1.8	887	8.0	9.5	0	0	10.0	90	.3	45000	3100
MAR 01...	1005	.35	869	8.2	10.0	0	0	15.0	138	.7	14000	760
APR 15...	1005	150	149	8.0	16.0	60	400	8.2	85	5.9	110000	34000
SEP 20...	1200	23	398	7.8	26.5	20	8	6.6	84	1.2	180000	37000
DATE	FECAL STREP-TOCOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV 02...	400	310	120	110	7.9	28	.7	3.6	226	0	99	48
JAN 03...	1900	--	--	--	--	--	--	--	--	--	--	--
FEB 11...	130000	80	8	29	1.8	3.5	.2	2.2	88	0	12	4.7
11...	100000	--	--	--	--	--	--	--	--	--	--	--
12...	11000	--	--	--	--	--	--	--	--	--	--	--
14...	880	--	--	--	--	--	--	--	--	--	--	--
MAR 01...	420	--	--	--	--	--	--	--	--	--	--	--
APR 15...	240000	62	5	22	1.7	3.2	.2	2.6	70	0	13	4.1
SEP 20...	6000	160	59	56	4.3	14	.5	4.0	120	0	57	25
DATE	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SI02) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	
NOV 02...	.3	8.1	416	2	0	.82	.00	.01	.21	.04	4.0	
JAN 03...	--	--	--	15	3	.11	.00	.00	.17	.03	5.3	
FEB 11...	.1	4.2	101	1520	208	.34	.02	.19	11	1.0	27	
11...	--	--	--	262	62	1.2	.02	.28	1.1	.47	11	
12...	--	--	--	6	4	2.3	.02	.11	.45	.13	4.6	
14...	--	--	--	0	0	2.4	.02	.02	2.7	.05	3.6	
MAR 01...	--	--	--	1	1	.60	.01	.02	.33	.01	2.0	
APR 15...	.1	2.8	84	572	204	.41	.02	.17	1.8	.51	14	
SEP 20...	.2	6.9	227	10	2	.53	.01	.01	.29	.13	5.5	

COLORADO RIVER BASIN

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08156800 SHOAL CREEK AT 12TH STREET, AUSTIN, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV 02...	0940	7	0	0	14	1	50
FEB 11...	0845	4	0	0	0	3	20
APR 15...	1005	42	0	0	2	2	20
SEP 20...	1200	53	100	0	0	3	60

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV 02...	0	0	.3	0	0	10
FEB 11...	0	0	.0	0	0	0
APR 15...	2	20	.0	0	0	10
SEP 20...	0	1	.0	0	0	10

DATE	TIME	TOTAL PCB (UG/L)	POLY-CHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
NOV 02...	0940	.0	.00	.00	.0	.00	.00	.00	.02	.01	.00	.00
FEB 11...	0845	.1	.00	.00	.2	.16	.13	.43	.13	.05	.00	.00
APR 15...	1005	.0	.00	.00	.1	.11	.02	.16	.61	.05	.00	.00
SEP 20...	1200	.0	.00	.00	.2	.00	.00	.00	.39	.01	.00	.00

DATE	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRIETHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRIETHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 02...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
FEB 11...	.02	.01	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
APR 15...	.00	.00	.01	.00	.00	.00	.00	0	.00	.04	.11	.02
SEP 20...	.00	.00	.00	.00	.00	.00	.00	0	.00	.01	.05	.00



## COLORADO RIVER BASIN

08157000 WALLER CREEK AT 38TH STREET, AUSTIN, TX

LOCATION.--Lat 30°17'49", Long 97°43'36", Travis County, Hydrologic Unit 12090205, on right bank 200 ft (61 m) upstream from bridge at East 38th Street in Austin, 1.1 mi (1.8 km) upstream from West Branch of Waller Creek, and 3.3 mi (5.3 km) upstream from Colorado River.

DRAINAGE AREA.--2.31 mi<sup>2</sup> (5.98 km<sup>2</sup>).

PERIOD OF RECORD.--April 1955 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 555.44 ft (169.298 m) above mean sea level.

REMARKS.--Records good. Flow slightly regulated at times by a small reservoir at Holy Cross High School (formerly St. Mary's Academy) on East 41st Street and a small swimming pool at the school which is drained into the creek every week or two during the summer. Water from other swimming pools also drain into the creek. Station is part of hydrologic research project to study rainfall-runoff relation for small urban areas. Two recording rain gages are located in the watershed. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--22 years, 1.69 ft<sup>3</sup>/s (0.0479 m<sup>3</sup>/s), 9.94 in/yr (252 mm/yr), 1,220 acre-ft/yr (1.50 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,970 ft<sup>3</sup>/s (55.8 m<sup>3</sup>/s) Oct. 29 1960, gage height, 7.77 ft (2.368 m); no flow for many days in 1955-57, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft<sup>3</sup>/s (8.50 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Dec. 10	2100	*379 10.7	5.12 1.561	Sept. 19	1645	321 9.09	4.93 1.503
Apr. 15	0615	304 8.61	4.87 1.484				

Minimum daily discharge, 0.08 ft<sup>3</sup>/s (0.002 m<sup>3</sup>/s) Sept. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.22	.26	.29	.31	.87	.44	.36	.57	.56	.51	.19	.09
2	.20	.23	.26	1.9	2.2	.48	.64	.49	.56	.51	.39	.09
3	.17	.21	.26	.50	1.4	13	.35	.43	.58	.52	.45	.09
4	6.1	.21	.26	.40	.53	.78	.77	.41	.57	.51	.42	.09
5	4.7	.21	6.7	.35	.50	.56	.32	.40	.56	.52	.45	.08
6	.21	.22	1.6	.82	.47	.51	.36	.41	.30	.48	.42	.09
7	.32	.20	.41	.39	.46	.49	.33	.39	.49	.49	.40	.10
8	.44	.20	.35	.78	.84	.48	.34	.38	.53	.53	.18	.15
9	.19	.21	.32	1.6	.46	.44	.35	.36	.51	.48	.32	.17
10	.18	.20	23	.34	12	.45	.35	.35	.55	.44	.42	.16
11	.18	.20	15	.37	41	.44	.35	.41	.55	.21	.40	.11
12	.21	.85	2.3	1.7	3.7	.39	.39	.34	.52	.43	.58	1.7
13	.18	5.2	.89	8.4	1.5	.39	4.6	.35	.28	.45	.41	9.7
14	.18	.26	1.0	.69	1.1	.39	.69	.32	.54	.44	.41	.33
15	9.7	.24	.62	.56	.90	.39	36	.32	3.7	.44	.22	.13
16	.74	.24	.53	.47	.84	.37	24	.32	.59	.43	.31	.12
17	.23	.68	.47	.45	.75	.37	1.3	.39	.54	1.5	.42	.12
18	.21	.27	.47	.42	.69	.37	.84	.33	.56	.23	.41	.11
19	8.8	7.5	1.4	.40	.64	.35	14	.84	.77	.41	.42	23
20	.25	.38	.54	.43	.58	.36	18	1.1	.26	.42	.42	.28
21	.22	.26	.40	.39	.55	.36	3.2	9.1	.73	.43	.41	.15
22	.17	.24	.39	9.2	.58	.36	1.4	.40	.97	.42	.17	.14
23	.81	.24	.38	1.7	.50	.36	.89	1.7	4.3	.42	.10	.18
24	7.8	.26	.36	.67	.50	.43	.73	.37	.88	.41	.10	.14
25	.30	4.6	.36	.61	.50	.41	.65	.30	.63	.19	.09	.12
26	.20	1.2	.33	.54	.45	-3.2	.57	.31	.51	.40	.10	.11
27	.18	.28	.32	.51	.44	5.4	.57	.29	.26	.43	.10	.11
28	4.1	.61	.36	.45	.44	2.0	.49	.29	.54	.45	.23	.11
29	34	.46	.47	.40	---	.42	.47	.28	.50	.45	.12	.10
30	.69	.35	.33	2.2	---	.35	1.5	.27	.50	.38	.12	.11
31	.34	---	.30	.60	---	.35	---	.26	---	.45	.10	---
TOTAL	82.22	26.47	60.67	38.55	75.39	35.09	114.81	22.48	23.34	14.38	9.28	37.98
MEAN	2.65	.88	1.96	1.24	2.69	1.13	3.83	.73	.78	.46	.30	1.27
MAX	34	7.5	23	9.2	41	13	36	9.1	4.3	1.5	.58	23
MIN	.17	.20	.26	.31	.44	.35	.32	.26	.26	.19	.09	.08
CFSM	1.15	.38	.85	.54	1.17	.49	1.66	.32	.34	.20	.13	.55
IN.	1.32	.43	.98	.62	1.21	.56	1.85	.36	.38	.23	.15	.61
AC-FT	163	53	120	76	150	70	228	45	46	29	18	75
(††)	5.68	1.75	2.77	1.88	2.72	1.83	5.20	1.12	1.50	.06	.09	3.00
CAL YR 1976	TOTAL 677.22	MEAN 1.85	MAX 69	MIN .14	CFSM .80	IN 10.90	AC-FT 1340	†† 36.11				
WTR YR 1977	TOTAL 540.66	MEAN 1.48	MAX 41	MIN .08	CFSM .64	IN 8.70	AC-FT 1070	†† 27.60				

†† Weighted-mean rainfall, in inches, based on two rain gages.

## 08157500 WALLER CREEK AT 23D STREET, AUSTIN, TX

LOCATION.--Lat 30°17'08", long 97°44'01", Travis County, Hydrologic Unit 12090205, on San Jacinto Boulevard, 50 ft (15 m) upstream from bridge on East 23d Street in Austin, and 2.1 mi (3.4 km) upstream from Colorado River.

DRAINAGE AREA.--4.13 mi<sup>2</sup> (10.70 km<sup>2</sup>).

PERIOD OF RECORD.--December 1954 to current year.

Water-quality records: Periodic chemical, biochemical, and pesticide analyses: October 1970 to September 1971.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 509.95 ft (155.433 m) above mean sea level.

REMARKS.--Records good. Some regulation by small dam upstream. Diversion of city water into channel during the summer months from municipal and private swimming pools. Some diversions into and out of drainage area by storm sewers. Station is part of a hydrologic research project to study rainfall-runoff relation for small urban areas. Three recording rain gages are located in watershed. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--22 years, 3.57 ft<sup>3</sup>/s (0.101 m<sup>3</sup>/s), 11.74 in/yr (298 mm/yr), 2,590 acre-ft/yr (3.19 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,020 ft<sup>3</sup>/s (114 m<sup>3</sup>/s) Oct. 11, 1973, gage height, 9.00 ft (2.743 m); minimum daily, 0.2 ft<sup>3</sup>/s (0.006 m<sup>3</sup>/s) at times in 1955-57.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum flood since 1885 occurred Apr. 22, 1915, stage unknown.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 641 ft<sup>3</sup>/s (18.2 m<sup>3</sup>/s) Apr. 15, gage height, 4.43 ft (1.350 m), no peak above base of 800 ft<sup>3</sup>/s (22.7 m<sup>3</sup>/s); minimum daily, 0.30 ft<sup>3</sup>/s (0.008 m<sup>3</sup>/s) Sept. 25, 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.48	.72	.64	.66	1.7	.97	.83	1.2	.81	.73	.75	.42
2	.41	.65	.60	3.9	4.3	1.0	1.4	1.1	.88	.70	.43	.41
3	.41	.62	.61	.96	2.7	24	.79	1.0	.90	.68	.60	.37
4	14	.64	.58	.77	1.0	1.6	1.9	.98	.81	.65	.60	.36
5	7.8	.63	13	.70	.94	1.1	.74	.98	.82	.73	.69	.32
6	.55	.61	4.0	1.6	.93	1.0	.79	.93	.79	.73	.57	.35
7	1.1	.59	.82	.73	.92	1.0	.77	.90	.77	.68	.55	.34
8	.88	.59	.74	2.0	1.7	1.0	.84	.85	.82	.68	.52	.78
9	.44	.61	.70	2.8	.89	1.0	.80	.89	.84	.61	.48	1.0
10	.43	.59	41	1.1	23	.98	.76	.82	.85	.58	.68	.64
11	.52	.66	26	1.2	68	.94	.80	.93	.86	.54	.67	.42
12	.49	2.4	4.6	3.7	5.5	.86	.82	.77	.76	.51	1.1	4.0
13	.55	11	1.8	15	3.0	.85	13	.77	.71	.64	.67	15
14	.51	.68	2.2	1.2	2.3	.90	1.7	.75	.86	.64	.62	.92
15	20	.62	1.3	.98	1.8	.87	72	.76	8.7	.65	.61	.44
16	1.8	.64	1.1	.87	1.7	.87	45	.77	.86	.58	.48	.36
17	.52	1.7	.97	.86	1.5	.88	3.0	1.2	.75	1.8	.62	.39
18	.51	.85	.95	.82	1.5	.89	2.0	.80	.78	.64	.68	.36
19	17	15	2.6	.81	1.3	.78	24	1.6	.99	.53	.73	36
20	.80	.91	1.0	.82	1.3	.81	29	2.3	.61	.67	.72	.82
21	.64	.65	.83	.78	1.2	.95	5.7	16	.97	.59	.64	.43
22	.57	.67	.82	18	1.2	.85	2.9	1.4	2.5	.65	.54	.39
23	2.4	.63	.78	3.3	1.1	.78	1.9	2.1	8.3	.54	.36	.36
24	16	.64	.75	1.2	1.1	.98	1.6	.93	1.2	.53	.38	.34
25	.90	9.6	.74	1.1	1.1	.85	1.4	.76	.84	.75	.36	.30
26	.64	2.4	.68	1.1	.98	6.4	1.2	.73	.73	.76	.37	.31
27	.69	.66	.68	1.0	.97	12	1.2	.70	.57	.65	.44	.30
28	9.3	1.2	.69	.91	.99	3.1	1.1	.66	.67	.65	.55	.34
29	60	.78	.83	.85	---	.93	1.1	.65	.72	.87	.39	.34
30	1.2	.76	.68	5.1	---	.81	2.4	.66	.70	.63	.49	.32
31	.87	---	.62	1.1	---	.79	---	.89	---	.60	.42	---
TOTAL	162.41	58.70	113.31	75.92	134.62	70.74	221.44	45.78	41.37	21.19	17.71	67.13
MEAN	5.24	1.96	3.66	2.45	4.81	2.28	7.38	1.48	1.38	.68	.57	2.24
MAX	60	15	41	18	68	24	72	16	8.7	1.8	1.1	.36
MIN	.41	.59	.58	.66	.89	.78	.74	.65	.57	.51	.36	.30
CFSM	1.27	.48	.89	.59	1.17	.55	1.79	.36	.33	.17	.14	.54
IN.	1.46	.53	1.02	.68	1.21	.64	1.99	.41	.37	.19	.16	.60
AC-FT	322	116	225	151	267	140	439	91	82	42	35	133
(††)	5.82	1.75	2.81	2.00	2.71	1.88	5.26	1.11	1.39	.12	.06	2.96

CAL YR 1976 TOTAL 1281.16 MEAN 3.50 MAX 121 MIN .35 CFSM .85 IN 11.54 AC-FT 2540 †† 37.06  
WTR YR 1977 TOTAL 1030.32 MEAN 2.82 MAX 72 MIN .30 CFSM .68 IN 9.28 AC-FT 2040 †† 27.87

†† Weighted-mean rainfall, in inches, based on three rain gages.

## COLORADO RIVER BASIN

08157900 TOWN LAKE AT AUSTIN, TX

LOCATION.--Lat 30°14'56", Long 97°43'03", Travis County, Hydrologic Unit 12090205, at Longhorn Dam on the Colorado River at Austin, 1.5 mi (2.4 km) downstream from Interstate Highway 35, and 2.3 mi (3.7 km) southeast of the State Capitol in Austin.

DRAINAGE AREA.--38,390 mi<sup>2</sup> (99,430 km<sup>2</sup>), approximately, of which 12,880 mi<sup>2</sup> (33,360 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: February 1975 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. PER 100 ML)	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)
DEC 28...	1100	554	8.0	17.0	0	1	9.4	100	.4	680	12	6
APR 26...	1050	550	8.1	17.0	0	2	10.3	110	.2	400	16	6
AUG 23...	1035	535	7.7	27.5	5	2	5.4	69	.9	1900	--	--

DATE	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
DEC 28...	210	36	49	22	26	.8	3.0	216	0	35	48
APR 26...	220	50	49	23	29	.9	3.4	204	0	37	53
AUG 23...	200	52	49	19	30	.9	3.4	180	0	37	54

DATE	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
DEC 28...	.3	8.4	298	1	0	.26	.00	.02	.25	.03	5.8
APR 26...	.2	8.7	304	2	0	.16	.00	.02	.30	.00	5.5
AUG 23...	.2	9.7	291	--	--	.25	.01	.05	.36	.01	2.8

COLORADO RIVER BASIN

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08157900 TOWN LAKE AT AUSTIN, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
DEC 28...	1100	1	0	0	10	7	40
APR 26...	1050	--	--	--	--	--	0
AUG 23...	1035	0	300	0	0	4	50

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
DEC 28...	3	0	.0	0	0	10
APR 26...	--	0	--	--	--	--
AUG 23...	0	0	.0	0	0	10

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
DEC 28...	1100	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
AUG 23...	1035	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
DEC 28...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
AUG 23...	.00	.00	.00	.00	.00	.00	.00	0	.00	.15	.00	.00

## COLORADO RIVER BASIN

08158000 COLORADO RIVER AT AUSTIN, TX  
(National stream-quality accounting network)

LOCATION.--Lat 30°14'40", long 97°41'39", Travis County, Hydrologic Unit 12090205, on right bank 1,000 ft (305 m) upstream from upstream bridge on U.S. Highway 183 in Austin, 1.4 mi (2.3 km) downstream from Longhorn Dam, and at mile 290.3 (467.1 km).

DRAINAGE AREA.--38,400 mi<sup>2</sup> (99,500 km<sup>2</sup>), approximately, of which 12,880 mi<sup>2</sup> (33,360 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1898 to current year. Records of daily discharge for Dec. 13-26, 1914, and Feb. 9-17, 1915, published in WSP 408, have been found unreliable and should not be used.

REVISED RECORDS.--WSP 508: 1915(M). WSP 528: 1900(M), 1918(M). WSP 548: 1901-16. WSP 1342: Drainage area. WSP 1562: 1908, 1929(M), 1936.

GAGE.--Water-stage recorder. Datum of gage is 402.27 ft (122.612 m) above mean sea level. Prior to June 19, 1939, all records collected at or near Congress Avenue Bridge 3.9 mi (6.3 km) upstream at datum 19.6 ft (5.97 m) higher; prior to June 18, 1915, nonrecording gages, recording gages thereafter; June 20, 1939, to Oct. 16, 1963, at site 1,000 ft (305 m) downstream from present site at datum 5.0 ft (1.52 m) higher.

REMARKS.--Water-discharge records good. National Weather Service gage-height telemetering device at station. Since 1937, at least 10 percent of drainage area regulated by reservoirs. Flow largely regulated by Lake Travis (station 08154500). The city of Austin reported that 71,600 acre-ft (88.3 hm<sup>3</sup>) was diverted for municipal use above station and 37,610 acre-ft (46.4 hm<sup>3</sup>) of treated sewage was returned below station. Many other diversions above Lake Buchanan for irrigation, municipal supplies, and oilfield operations.

AVERAGE DISCHARGE.--38 years (water years 1899-1936) unregulated, 2,711 ft<sup>3</sup>/s (76.78 m<sup>3</sup>/s), 1,964,000 acre-ft/yr (2.42 km<sup>3</sup>/yr); 41 years (water years 1937-77) regulated, 2,069 ft<sup>3</sup>/s (58.59 m<sup>3</sup>/s), 1,499,000 acre-ft/yr (1.85 km<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 481,000 ft<sup>3</sup>/s (13,600 m<sup>3</sup>/s) June 15, 1935, gage height, 50 ft (15.2 m), present site and datum, from floodmark; minimum daily, 10 ft<sup>3</sup>/s (0.28 m<sup>3</sup>/s) Dec. 17, 1972.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1833, 51 ft (15.5 m) July 7, 1869, present site and datum (adjusted to present site on basis of record for flood of June 15, 1935), determined from information concerning stage at former site furnished by Dean T. U. Taylor.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 34,300 ft<sup>3</sup>/s (971 m<sup>3</sup>/s) Apr. 16, gage height, 22.23 ft (6.776 m); minimum daily, 111 ft<sup>3</sup>/s (3.14 m<sup>3</sup>/s) Nov. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2310	146	2510	1020	3040	1650	3290	22300	5900	2650	1680	2340
2	2310	135	165	1740	1990	1360	3500	22200	5920	2790	1690	2220
3	2340	131	140	1710	885	1760	3320	11900	5890	2370	1710	2260
4	2000	131	141	1020	482	1590	3320	5540	5900	2630	2000	2420
5	921	130	224	1050	331	1610	3310	5410	5640	2480	2080	2390
6	146	134	1490	1990	354	1480	3430	5340	5680	2090	2060	2370
7	142	132	1650	590	374	1610	3030	5480	5910	2120	2060	2280
8	125	111	1240	350	1090	1500	1870	5240	5910	2000	2130	2470
9	134	129	1710	1670	1050	727	1860	5400	5890	1850	2090	2360
10	131	151	1320	2950	1830	737	1860	5420	4990	1780	2020	2600
11	127	133	1500	2370	2880	779	1890	5490	3550	1880	2060	2730
12	127	127	1110	1560	2520	780	1810	5330	3610	1850	1380	2780
13	131	826	1190	665	2200	745	2070	5130	3650	1760	2270	1960
14	127	131	1980	566	2550	950	1830	5310	3520	1700	2460	890
15	308	472	2000	579	2460	967	7450	5300	3660	1740	2350	1220
16	161	139	1030	833	2220	919	29400	5300	3670	1730	2370	1290
17	125	329	2000	2660	1960	1170	31500	5300	3600	1740	2300	1340
18	113	142	234	2360	551	1170	30100	5310	3820	1760	2330	1250
19	278	258	1340	3430	468	1130	29800	5320	3490	1460	2260	1540
20	129	153	1230	1290	428	725	22300	5320	3290	2290	2280	1250
21	118	148	1570	387	454	1170	7390	5470	3070	1260	2300	1320
22	122	1140	672	627	1270	1190	16800	5330	2750	1130	2300	1250
23	128	1930	446	518	1300	691	14500	5320	2720	1030	2260	1010
24	250	2050	525	459	1110	1010	10200	8110	2650	1020	2280	1020
25	131	955	207	711	628	1010	5490	13800	2590	1030	2280	1120
26	124	1080	185	1290	1190	1060	5700	8640	2480	1290	2290	1830
27	129	2250	526	1330	1460	2210	5660	5780	2730	1400	2300	1240
28	173	3350	467	1270	1440	3350	5510	5860	2500	1340	2310	978
29	1220	3060	683	960	---	3400	5480	5960	2630	1620	2320	1280
30	180	3520	191	1220	---	2780	10700	5880	2510	1830	2310	1230
31	154	---	1120	2130	---	3400	---	5880	---	1680	2340	---
TOTAL	14914	23523	30796	41305	38515	44630	274370	223370	120120	55300	66870	52238
MEAN	481	784	993	1332	1376	1440	9146	7205	4004	1784	2157	1741
MAX	2340	3520	2510	3430	3040	3400	31500	22300	5920	2790	2460	2780
MIN	113	111	140	350	331	691	1810	5130	2480	1020	1380	890
AC-FT	29580	46660	61080	81930	76390	88520	544200	443100	238300	109700	132600	103600
CAL YR 1976	TOTAL	536446	MEAN	1466	MAX	5690	MIN	36	AC-FT	1064000		
WTR YR 1977	TOTAL	985951	MEAN	2701	MAX	31500	MIN	111	AC-FT	1956000		



## COLORADO RIVER BASIN

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08158000 COLORADO RIVER AT AUSTIN, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1947 to current year. Sediment records: October 1974 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1947 to current year.

WATER TEMPERATURES: October 1947 to current year.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 737 micromhos Jan. 12, 1964; minimum daily, 243 micromhos Dec. 2, 1953.

WATER TEMPERATURES (1947-76): Maximum daily, 31.0°C on several days during summer months; minimum daily, 6.0°C Jan. 28, 1948, Feb. 4, 1949.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 598 micromhos Sept. 2; minimum daily, 384 micromhos Nov. 10.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIO-CHEMICAL OXYGEN DEMAND 5 DAY (MG/L)
OCT 12...	1546	113	499	8.5	26.0	1	1	14.2	178	1.1
NOV 09...	0838	128	526	7.5	22.0	2	1	5.4	64	.4
DEC 14...	1145	3030	525	7.7	13.5	2	6	10.6	105	.3
JAN 17...	1216	3410	550	7.9	11.0	1	4	11.2	105	.2
FEB 15...	0754	2560	541	7.6	13.0	2	8	10.6	104	.3
MAR 07...	1450	2050	543	8.0	17.0	1	1	11.4	121	.6
APR 12...	1048	2910	554	8.2	18.0	0	2	10.6	115	.2
MAY 18...	1005	5300	489	7.7	20.0	5	7	9.3	106	.1
JUN 13...	1610	3820	492	7.4	25.0	0	3	9.6	119	.5
JUL 18...	0945	241	529	7.5	28.0	4	2	7.4	95	.4
AUG 16...	0810	192	544	7.4	27.5	2	1	5.8	74	.2
SEP 07...	0835	264	550	7.8	27.0	3	0	6.3	80	.6
DATE	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	FECAL STREPTOCOCCI (COL. PER 100 ML)	HARDNESS (CA, MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)
OCT 12...	7000	620	29	210	44	48	21	25	.8	3.0
NOV 09...	15000	2300	140	230	30	61	19	20	.6	2.3
DEC 14...	10000	1500	280	200	40	47	21	27	.8	3.0
JAN 17...	1800	330	94	220	47	52	22	27	.8	3.1
FEB 15...	6800	1200	620	210	42	49	21	28	.8	3.2
MAR 07...	330	9	17	--	--	--	--	--	--	--
APR 12...	210	27	44	210	44	46	23	29	.9	3.5
MAY 18...	6000	190	500	190	40	43	19	26	.8	3.1
JUN 13...	10000	1700	240	180	41	41	19	27	.9	3.3
JUL 18...	32000	1600	110	210	50	51	19	32	1.0	3.6
AUG 16...	44000	330	300	210	50	51	21	30	.9	3.4
SEP 07...	19000	70	1400	200	43	50	18	28	.9	3.3

## COLORADO RIVER BASIN

08158000 COLORADO RIVER AT AUSTIN, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)
OCT 12...	182	8	29	44	.6	9.3	280	278	1	0
NOV 09...	244	0	27	31	.4	8.9	295	290	0	0
DEC 14...	200	0	32	49	.2	8.6	290	286	12	0
JAN 17...	212	0	35	49	.1	8.3	302	301	10	2
FEB 15...	204	0	35	50	.2	7.7	296	295	24	3
MAR 07...	--	--	--	--	--	--	--	--	2	0
APR 12...	202	0	35	54	.2	8.0	338	298	3	0
MAY 18...	178	0	32	45	.2	6.7	277	263	11	2
JUN 13...	170	0	37	47	.2	7.5	278	266	4	0
JUL 18...	190	0	37	51	.2	9.8	300	297	2	1
AUG 16...	200	0	38	53	.2	9.6	302	305	2	1
SEP 07...	190	0	34	45	.2	10	289	282	1	0

DATE	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUS- PENDE SEDI- MENT (MG/L)	SUS- PENDE SEDI- MENT DIS- CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT 12...	.04	.00	.01	.25	.01	2.2	1	.31	75
NOV 09...	.26	.01	.05	--	.02	3.1	2	.69	10
DEC 14...	.21	.00	.04	.12	.03	3.4	30	245	56
JAN 17...	.33	.00	.02	.21	.01	2.4	16	147	49
FEB 15...	.20	.00	.04	.20	.03	4.0	6	41	63
MAR 07...	.12	.00	.02	.07	.01	6.8	8	44	84
APR 12...	.19	.00	.02	.24	.01	4.5	13	102	19
MAY 18...	.27	.00	.01	.04	.15	4.0	12	172	82
JUN 13...	.24	.01	.03	.07	.05	2.2	6	62	58
JUL 18...	.30	.01	.02	.26	.01	2.8	2	1.3	58
AUG 16...	.08	.01	--	--	.04	2.4	3	1.6	83
SEP 07...	.17	.01	--	--	.01	3.0	4	2.9	90

COLORADO RIVER BASIN

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08158000 COLORADO RIVER AT AUSTIN, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	
DATE	TIME									
OCT										
12...	1546	2	2	--	100	0	0	10	0	
FEB										
15...	0754	2	1	--	0	2	2	50	0	
JUN										
13...	1610	0	0	--	0	<10	1	20	0	
AUG										
16...	0810	0	1	200	100	<10	1	0	10	
		TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)
DATE										
OCT										
12...	0	0	6	4	50	0	2	2	10	
FEB										
15...	0	0	1	1	370	10	4	0	30	
JUN										
13...	<50	0	<10	2	140	20	<100	1	10	
AUG										
16...	<50	1	20	1	30	10	<100	2	20	
		DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
DATE										
OCT										
12...	10	.1	.1	0	0	--	0	30	10	
FEB										
15...	0	.1	.1	0	0	--	0	10	0	
JUN										
13...	8	.4	.0	1	0	--	0	6	0	
AUG										
16...	20	.0	.0	0	0	<10	0	10	2	

## COLORADO RIVER BASIN

08158000 COLORADO RIVER AT AUSTIN, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 12,76 1546	NOV 9,76 0838	JAN 17,77 1216	FEB 15,77 0754	MAY 18,77 1005
TOTAL CELLS/ML	410	360	72	310	170
DIVERSITY: DIVISION	0.8	1.5	1.4	1.0	0.9
..CLASS	0.8	1.5	1.4	1.6	0.9
..ORDER	0.8	2.0	1.6	1.8	0.9
...FAMILY	2.7	2.8	2.0	2.4	2.2
....GENUS	2.9	2.8	2.0	2.5	2.6

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....CHARACIACEAE										
....SCHROEDERIA	--	-	--	-	--	-	--	-	--	-
...COELASTRACEAE										
....COELASTRUM	--	-	45	12	--	-	--	-	55#	32
...MICRACTINIACEAE										
....MICRACTINIUM	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE										
....ANKISTRODESMUS	--	-	3	1	--	-	3	1	--	-
....CHODATELLA	--	-	--	-	--	-	--	-	--	-
....FRANCEIA	--	-	--	-	--	-	--	-	7	4
...OOCYSTIS	--	-	8	2	--	-	--	-	--	-
...TETRAEDRON	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE										
....SCENEDESMUS	--	-	62#	17	--	-	*	0	27#	16
...TETRASTRUM	--	-	--	-	--	-	--	-	27#	16
...CLADOPHORALES										
...CLADOPHORACEAE										
....CLADOPHORA	--	-	--	-	--	-	--	-	--	-
...TETRASPORALES										
...PALMELLACEAE										
...GLOFOCYSTIS	--	-	25	7	--	-	--	-	--	-
...VOLVOCALES										
...CHLAMYDOMONADACEAE	--	-	--	-	--	-	--	-	--	-
....CARTERIA	83#	20	6	2	--	-	--	-	--	-
...CHLAMYDOMONAS	10	2	--	-	--	-	--	-	--	-
...CHLOROGONIUM	--	-	--	-	--	-	--	-	--	-
...VOLVOCAEAE										
...GONIUM	--	-	--	-	--	-	--	-	--	-
...PANDORINA	--	-	--	-	--	-	--	-	--	-
CHRYSTOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	--	-	8	2	3	5	3	1	--	-
....MELOSIRA	--	-	--	-	--	-	6	2	--	-
...PENNALES										
...ACHNANTHACEAE										
....ACHNANTHES	10	2	--	-	--	-	--	-	7	4
....COCCONEIS	--	-	--	-	--	-	--	-	14	8
...RHOICOSPHEINIA	21	5	3	1	--	-	11	4	--	-
...CYMBELLACEAE										
....AMPHORA	--	-	--	-	--	-	--	-	*	0
...CYMBELLA	41	10	--	-	--	-	--	-	7	4
...EPITHEMIA	--	-	--	-	--	-	--	-	--	-
...DIATOMACEAE										
....DIATOMA	--	-	--	-	--	-	17	6	--	-
...FRAGILARIACEAE										
....FRAGILARIA	--	-	--	-	--	-	--	-	*	0
...SYNEDRA	52	13	17	5	--	-	17	6	--	-
...GOMPHONEMACEAE										
....GOMPHONEMA	72#	17	28	8	--	-	--	-	*	0
...NAVICULACEAE										
....MASTOGLIOIA	--	-	--	-	--	-	*	0	--	-
...NAVICULA	62	15	6	2	10	14	11	4	*	0
...NITZSCHIA										
....NITZSCHIA	62	15	11	3	14#	19	34	11	27#	16
...SIRIURELLACEAE										
....SIRIURELLA	--	-	--	-	--	-	--	-	*	0
...CHRYSTOPHYCEAE										
...CHRYSONOMADALES										
...OCHROMONADACEAE										
...DINORRYON	--	-	--	-	--	-	86#	28	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

COLORADO RIVER BASIN

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08158000 COLORADO RIVER AT AUSTIN, TX.--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 12,76 1546		NOV 9,76 0838		JAN 17,77 1216		FEB 15,77 0754		MAY 18,77 1005	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCALES										
...CHROCOCCACEAE										
...ANACYSTIS	--	-	--	-	--	-	--	-	--	-
...HORMOGONALES										
...OSCILLATORIA										
...LYNGBYA	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIA	--	-	140#	39	35#	48	120#	38	--	-
EUGLENOPHYTA (EUGLENIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDAE										
...CRYPTOCHRYSIDACEAE										
...CHROOMONAS	--	-	--	-	--	-	--	-	--	-
...CRYPTOMONODACEAE										
...CRYPTOMONAS	--	-	--	-	10	14	--	-	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
...EUGLENA	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...PERIDINIALES										
...GLENODINIACEAE										
...GLENODINIUM	--	-	--	-	--	-	*	0	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%



08158000 COLORADO RIVER AT AUSTIN, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	JUN 13,77 1610	JUL 18,77 0945	AUG 16,77 0810	SEP 7,77 0835
TOTAL CELLS/ML	850	320	480	23
DIVERSITY: DIVISION	1.2	1.5	1.2	1.0
..CLASS	1.2	1.5	1.3	1.0
..ORDER	1.9	2.4	1.7	1.4
...FAMILY	2.7	2.8	2.5	2.5
....GENUS	3.0	0.0	3.0	2.5

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)								
..CHLOROPHYCEAE								
...CHLOROCOCCALES								
....CHARACIACEAE								
....SCHROEDERIA	7	1	--	-	--	-	--	-
....COELASTRACEAE								
....COELASTRUM	170#	20	--	-	--	-	--	-
...MICRACITINACEAE								
....MICRACITINUM	--	-	--	-	18	4	--	-
...OOCYSTACEAE								
....ANKISTRODESMUS	--	-	5	2	--	-	--	-
....CHODATELLA	7	1	--	-	--	-	--	-
....FRANCEIA	--	-	--	-	--	-	--	-
....OOCYSTIS	28	3	5	2	--	-	--	-
....TETRAEDRON	7	1	--	-	5	1	--	-
...SCENEDESMACEAE								
....SCENEDESMUS	70	8	10	3	32	7	6#	29
....TETRASTRUM	--	-	--	-	--	-	--	-
..CLADOPHORALES								
...CLADOPHORACEAE								
....CLADOPHORA	--	-	100#	32	--	-	--	-
..TETRASPORALES								
...PALMELLACEAE								
...GLOEOCYSTIS	--	-	--	-	--	-	--	-
..VOLVOCALES								
...CHLAMYDOMONADACEAE	--	-	10	3	--	-	--	-
....CARTERIA	7	1	--	-	120#	24	--	-
....CHLAMYDOMONAS	63	7	--	-	23	5	3	14
....CHLOROGONIUM	7	1	--	-	--	-	--	-
...VOLVOCAEEAE								
....GONIUM	63	7	--	-	83#	17	--	-
....PANDORINA	110	13	82#	25	74#	15	--	-
CHRYSTOPHYTA								
..BACILLARIOPHYCEAE								
...CENTRALES								
....COSCONODISCACEAE								
....CYCLOTETRA	--	-	--	-	--	-	--	-
....MELOSIRA	--	-	--	-	--	-	--	-
..PENNALES								
...ACHNANTHACEAE								
....ACHNANTHES	7	1	--	-	--	-	--	-
....COCCONEIS	14	2	--	-	--	-	3	14
....RHOICOSPHEMIA	--	-	--	-	--	-	--	-
...CYMBELLACEAE								
....AMPHORA	--	-	5	2	--	-	--	-
....CYMBELLA	--	-	10	3	--	-	--	-
....EPITHEMIA	--	-	--	-	--	-	3	14
...DIATOMACEAE								
....DIATOMA	--	-	5	2	--	-	--	-
...FRAGILARIACEAE								
....FRAGILARIA	--	-	--	-	--	-	--	-
....SYNEDRA	--	-	--	-	14	3	--	-
...GOMPHONEMACEAE								
....GOMPHONEMA	--	-	--	-	--	-	3	14
...NAVICULACEAE								
....MASTOGLIOIA	--	-	--	-	--	-	--	-
....NAVICULA	--	-	5	2	--	-	--	-
...NITZSCHACEAE								
....NITZSCHIA	28	3	10	3	5	1	3	14
...SURIPELLACEAE								
....SURIPELLA	--	-	--	-	--	-	--	-
..CHRYSTOPHYCEAE								
...CHRYSONOMADACEAE								
....DINOBRYON	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%  
 \* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

COLORADO RIVER BASIN

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08158000 COLORADO RIVER AT AUSTIN, TX.--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	JUN 13,77 1610		JUL 18,77 0945		AUG 16,77 0810		SEP 7,77 0835	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)								
..CYANOPHYCEAE								
...CHROCOCCALES								
...CHROCOCCACEAE								
....ANACYSTIS	--	-	--	-	88#	18	--	-
...HORMOGONALES								
...OSCILLATORIA								
....LYNGBYA	--	-	51#	16	--	-	--	-
...OSCILLATORIA	250#	30	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)								
..CRYPTOPHYCEAE								
...CRYPTOMONADALES								
...CRYPTOCHRYSIDACEAE								
....CHROOMONAS	--	-	--	-	18	4	--	-
...CRYPTOMONODACEAE								
....CRYPTOMONAS	7	1	10	3	--	-	--	-
..EUGLENOPHYCEAE								
...EUGLENALES								
...EUGLENACEAE								
....EUGLENA	--	-	--	-	5	1	--	-
PYRRHOPHYTA (FIRE ALGAE)								
..DINOPHYCEAE								
...PERIDINIALES								
...GLENODINIACEAE								
...GLENODINIUM	--	-	10	3	5	1	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%  
\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	14914	516	280	11400	44	1760	30	1220	200
NOV. 1976.....	23523	486	260	16800	41	2590	28	1790	190
DEC. 1976.....	30796	511	280	23100	43	3590	30	2490	200
JAN. 1977.....	41305	519	280	31500	44	4910	31	3420	200
FEB. 1977.....	38515	509	280	28900	43	4480	30	3100	200
MAR. 1977.....	44630	545	300	35700	46	5590	33	3920	210
APR. 1977.....	274370	531	290	215000	45	33400	31	23300	200
MAY 1977.....	223370	503	270	164000	43	25700	29	17700	190
JUNE 1977.....	120120	489	270	86800	41	13300	28	9170	190
JULY 1977.....	55300	497	270	40500	42	6250	29	4330	190
AUG. 1977.....	66870	524	290	51600	44	8020	31	5600	200
SEPT 1977.....	52238	542	300	41700	46	6490	32	4560	210
TOTAL .....	985951	**	**	747000	**	116000	**	80600	**
WTD.AVG. ....	2701.24	515	280	**	44	**	30	**	200

## COLORADO RIVER BASIN

08158000 COLORADO RIVER AT AUSTIN, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	528	434	522	439	533	559	491	540	494	455	496	545
2	516	550	549	533	540	552	502	537	490	483	506	598
3	511	485	463	485	544	559	491	520	488	499	508	544
4	489	415	443	557	452	516	497	518	489	490	465	512
5	516	399	508	569	509	544	514	509	490	508	516	534
6	523	441	489	467	435	534	518	515	486	506	521	547
7	544	559	511	471	487	560	502	518	489	489	516	550
8	477	463	504	541	457	555	463	502	487	491	523	544
9	495	526	540	457	477	552	471	500	488	496	519	531
10	507	384	526	521	485	491	480	502	487	493	521	539
11	425	430	499	530	491	485	491	500	488	499	519	535
12	499	457	490	551	423	480	554	497	483	495	491	539
13	514	534	540	525	516	500	532	495	492	493	523	541
14	473	401	478	546	507	526	522	491	485	494	520	524
15	438	535	523	424	543	535	463	487	481	496	523	536
16	521	585	530	442	428	557	528	485	485	492	520	541
17	554	506	496	525	514	561	546	482	483	508	524	550
18	581	481	510	554	486	555	544	487	482	498	527	544
19	521	509	496	547	455	550	542	489	487	506	542	546
20	519	415	500	530	505	552	536	483	496	483	531	507
21	505	413	468	457	510	539	546	477	490	495	530	539
22	498	471	540	514	551	542	535	487	483	503	527	535
23	509	538	553	475	557	545	528	483	482	510	536	536
24	500	495	556	425	562	552	540	484	499	505	530	550
25	505	506	475	493	560	538	530	485	489	502	532	547
26	569	521	396	526	562	545	528	486	490	516	544	546
27	564	500	553	542	557	565	532	487	491	507	540	542
28	570	425	565	508	568	555	540	490	518	510	536	544
29	560	500	525	551	---	547	538	489	509	511	538	550
30	507	475	483	546	---	550	535	496	491	513	532	544
31	546	---	538	559	---	551	---	486	---	505	538	---
MEAN	516	478	509	510	508	540	518	497	490	498	522	541

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	15.5	10.5	9.5	---	12.0	---	---	18.0	21.5	24.5	24.0
2	23.0	---	11.0	9.0	8.0	13.0	---	14.5	18.5	22.0	24.5	24.0
3	---	---	11.0	---	9.0	12.0	---	14.5	18.5	22.0	24.5	23.5
4	---	18.0	12.0	8.5	9.5	13.0	---	14.5	---	22.0	24.5	---
5	21.5	18.0	12.0	11.0	---	13.0	12.0	19.5	19.0	22.0	24.5	---
6	24.0	17.0	14.5	---	10.5	12.0	12.0	---	18.5	22.0	24.5	24.0
7	20.5	17.0	11.0	---	---	11.5	---	16.5	19.0	22.0	23.5	---
8	19.5	17.0	11.0	---	11.0	10.5	---	16.5	18.5	22.0	24.0	23.0
9	19.5	17.0	11.5	---	10.0	---	---	16.5	---	22.0	23.5	---
10	18.0	17.0	---	---	---	11.0	---	16.5	19.0	23.0	24.0	---
11	19.0	17.0	---	7.0	10.5	14.0	---	16.5	19.0	23.5	24.0	---
12	19.0	17.0	11.0	7.0	10.0	13.0	14.0	16.5	---	22.0	23.0	---
13	19.5	---	10.5	---	10.0	14.0	14.5	16.5	---	22.0	24.5	23.0
14	---	14.5	---	---	10.0	14.0	---	16.5	19.5	25.5	23.5	23.5
15	---	13.5	10.5	---	10.0	16.5	---	16.5	21.0	23.5	23.5	---
16	---	13.0	11.0	---	10.0	14.0	---	12.0	---	23.5	24.0	---
17	---	13.0	11.5	---	10.0	15.5	14.0	16.5	---	24.0	24.0	24.0
18	---	13.0	---	6.5	13.0	15.0	---	16.5	---	24.0	24.0	24.0
19	18.5	13.5	12.0	6.5	10.0	15.0	14.5	---	---	24.0	23.5	---
20	17.0	14.0	11.5	---	11.0	15.0	---	19.5	---	24.0	23.0	24.5
21	---	14.0	10.5	---	---	15.5	14.5	19.5	21.0	---	23.5	24.0
22	---	16.0	10.5	9.5	12.0	14.5	14.5	---	20.5	23.5	23.5	---
23	---	12.0	11.0	---	12.0	15.0	---	---	---	23.5	23.0	---
24	---	---	11.5	11.0	12.0	14.5	13.5	18.5	---	---	23.0	---
25	---	12.0	11.5	10.0	12.0	---	---	18.0	---	24.5	23.5	---
26	18.0	13.5	---	9.5	12.0	---	14.0	16.5	---	24.5	23.5	---
27	17.0	---	---	9.5	12.0	14.5	15.0	17.0	---	24.5	23.5	25.0
28	---	---	12.0	10.0	11.0	14.0	15.0	18.0	21.0	24.5	23.5	24.5
29	---	---	11.5	8.5	---	14.5	---	18.0	21.5	25.5	23.5	---
30	---	10.5	---	9.5	---	14.5	15.5	18.0	21.5	25.5	23.5	---
31	19.0	---	---	9.0	---	14.5	---	18.0	---	---	24.0	---
MEAN	19.5	15.0	11.5	9.0	10.5	14.0	14.0	17.0	19.5	23.5	24.0	24.0

## COLORADO RIVER BASIN

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08158050 BOGGY CREEK AT U.S. HIGHWAY 183, AUSTIN, TX

LOCATION.--Lat 30°15'47", long 97°40'20", Travis County, Hydrologic Unit 12090205, on U.S. Highway 183, 1.6 mi (2.6 km) south of the intersection of Webberville Road and U.S. Highway 183, and 4.1 mi (6.6 km) east of the State Capitol Building in Austin.

DRAINAGE AREA.--13.1 mi<sup>2</sup> (33.9 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January to July 1975 (periodic discharge measurements only), August 1975 to June 1977 (operated as a flood-hydrograph partial-record station only), June to September 1977.

GAGE.--Water-stage recorder. Datum of gage is 411.29 ft (125.361 m) above mean sea level (levels from city of Austin bench mark).

REMARKS.--Water-discharge records poor. No known regulation or diversions. There is one recording rain gage located in the watershed above station. The station is part of a hydrologic research project to study the rainfall-runoff relationship for the Austin urban area.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,100 ft<sup>3</sup>/s (173 m<sup>3</sup>/s) May 23, 1975, gage height, 17.03 ft (5.191 m), from floodmark, from rating curve extended above 500 ft<sup>3</sup>/s (14.2 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; minimum discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 750 ft<sup>3</sup>/s (21.2 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 19	2345	*1,560 44.2	10.71 3.264	Sept. 19	1815	1,180 33.4	9.97 3.039

Minimum discharge, 0.03 ft<sup>3</sup>/s (0.001 m<sup>3</sup>/s) Aug. 23 to Sept. 11, Sept. 15-18.

DISCHARGE, IN CUBIC FEET PER SECOND, JUNE TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1									---	.57	.25	.03
2									---	.57	.24	.03
3									---	.45	.23	.03
4									---	.44	.22	.03
5									---	.44	.21	.03
6									---	.46	.20	.03
7									---	.51	.19	.03
8									---	.45	.18	.92
9									---	.44	.17	.03
10									---	.46	.16	.03
11									---	.45	.15	.03
12									---	.46	.14	.56
13									---	.38	.13	50
14									---	.37	.12	7.5
15									---	.36	.11	.03
16									3.1	.35	.10	.03
17									1.6	1.3	.09	.03
18									1.3	.49	.08	.03
19									2.2	.38	.07	100
20									.86	.37	.06	8.0
21									2.3	.36	.05	.08
22									3.3	.35	.04	.08
23									24	.34	.03	.08
24									3.8	.33	.03	.07
25									.88	.32	.03	.07
26									.69	.31	.03	.07
27									.68	.30	.03	.06
28									.55	.29	.03	.06
29									.56	.28	.03	.06
30									.59	.27	.03	.05
31									---	.26	.03	---
TOTAL									---	13.11	3.46	168.08
MEAN									---	.42	.11	5.60
MAX									---	1.3	.25	100
MIN									---	.26	.03	.03
CFSM									---	.03	.008	.43
IN.									---	.04	.01	.48
AC-FT									---	.26	6.9	333
(††)									---	.20	.07	2.55

WTR YR 1977 TOTAL - MEAN - MAX - MIN - CFSM - IN - AC-FT - †† -

†† Rainfall, in inches, based on one rain gage.

NOTE.--No gage-height record July 18 to Aug. 23.

## COLORADO RIVER BASIN

08158050 BOGGY CREEK AT U.S. HIGHWAY 183, AUSTIN, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Periodic chemical, biochemical, and pesticide analyses: January 1975 to current year.

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL./100 ML)
NOV 03...	1150	6.3	735	8.1	17.0	0	0	9.9	105	.2	3000	330
JAN 03...	1240	2.6	639	8.1	7.7	5	3	11.8	100	1.9	56000	1500
FEB 11...	1245	493	157	8.2	15.0	50	1200	9.6	98	5.2	400000	41000
11...	1725	67	347	7.9	16.0	30	200	8.3	86	5.0	540000	72000
12...	1030	19	669	8.2	13.0	10	20	9.6	94	.8	42000	6800
14...	1105	17	843	8.1	12.5	5	3	9.8	95	.4	26000	2500
MAR 02...	1354	2.6	695	8.4	17.5	5	15	16.5	177	4.9	100000	8000
MAY 17...	1300	.68	733	8.1	23.0	0	20	10.7	127	.8	30000	1900
JUL 11...	1320	.45	666	7.6	30.5	5	5	13.6	181	.8	50000	3200
SEP 21...	1345	.08	542	8.1	30.0	5	4	7.2	96	.6	20000	1500

DATE	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV 03...	170	320	73	110	10	34	.8	3.5	296	0	71	49
JAN 03...	1500	--	--	--	--	--	--	--	--	--	--	--
FEB 11...	190000	67	3	24	1.8	3.7	.2	3.0	78	0	12	3.2
11...	170000	--	--	--	--	--	--	--	--	--	--	--
12...	8400	--	--	--	--	--	--	--	--	--	--	--
14...	2200	--	--	--	--	--	--	--	--	--	--	--
MAR 02...	310	--	--	--	--	--	--	--	--	--	--	--
MAY 17...	780	300	64	100	11	37	.9	2.5	282	0	81	50
JUL 11...	520	--	--	--	--	--	--	--	--	--	--	--
SEP 21...	840	220	38	72	9.4	24	.7	3.8	220	0	45	36

DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
NOV 03...	.3	14	438	1	0	.77	.01	.01	.23	.08	2.4
JAN 03...	--	--	--	4	1	.30	.01	.03	.45	.07	4.8
FEB 11...	.1	7.1	93	3320	388	.37	.02	.15	4.4	1.7	40
11...	--	--	--	462	70	.97	.02	.22	1.5	.46	26
12...	--	--	--	44	13	1.5	.01	.05	.51	.14	5.4
14...	--	--	--	6	2	1.3	.01	.05	.58	.09	5.2
MAR 02...	--	--	--	26	4	.12	.01	.04	.81	.12	3.6
MAY 17...	.4	13	434	25	1	.70	.01	.02	--	.06	1.8
JUL 11...	--	--	--	11	3	.07	.01	.01	.19	.04	3.3
SEP 21...	.3	13	312	8	0	.36	.01	.01	.04	.06	4.2

## COLORADO RIVER BASIN

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08158050 BOGGY CREEK AT U.S. HIGHWAY 183, AUSTIN, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
NOV 03...	1150	6	100	0	0	0	0
FEB 11...	1245	7	0	0	2	3	30
MAY 17...	1300	2	0	0	10	1	10
SEP 21...	1345	20	200	0	0	1	10

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
NOV 03...	0	10	.2	0	0	10
FEB 11...	0	0	.0	0	0	0
MAY 17...	0	10	.0	0	0	5
SEP 21...	0	10	.0	1	0	10

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
NOV 03...	1150	.0	.00	.00	.0	.00	.00	.00	.03	.00	.00	.00
FEB 11...	1245	.1	.00	.00	.2	.35	.25	1.0	.14	.03	.04	.00
MAY 17...	1300	.0	.00	.00	.0	.00	.01	.02	.02	.00	.00	.00
SEP 21...	1345	.0	.00	.00	.0	.00	.00	.00	.15	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 03...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
FEB 11...	.01	.01	.00	.00	.00	.00	.00	1	.00	.00	.09	.00
MAY 17...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
SEP 21...	.00	.00	.00	.00	.00	.00	.00	1	.00	.00	.01	.00



## 08158600 WALNUT CREEK AT WEBBERVILLE ROAD, AUSTIN, TX

LOCATION.--Lat 30°16'59", long 97°39'17", Travis County, Hydrologic Unit 12090205, on left bank 190 ft (58 m) downstream from bridge on Farm Road 969, 0.8 mi (1.3 km) downstream from Little Walnut Creek, 2.8 mi (4.5 km) upstream from Colorado River, and 5.2 mi (8.4 km) east of the State Capitol Building in Austin.

DRAINAGE AREA.--51.3 mi<sup>2</sup> (132.9 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 425.96 ft (129.833 m) above mean sea level.

REMARKS.--Records fair. No known regulation or diversion. Station is part of hydrologic research project to study rainfall-runoff relation for urban areas. Six recording rain gages are located in watershed. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--11 years, 23.4 ft<sup>3</sup>/s (0.663 m<sup>3</sup>/s), 6.19 in/yr (157 mm/yr), 16,950 acre-ft/yr (20.9 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,500 ft<sup>3</sup>/s (297 m<sup>3</sup>/s) Nov. 23, 1974, gage height, 26.16 ft (7.974 m); no flow at times in 1967 and 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1891, that of Nov. 23, 1974; 25.56 ft (7.791 m) occurred on Oct. 11, 1973, discharge 10,000 ft<sup>3</sup>/s (283 m<sup>3</sup>/s); and 24 ft (7.3 m) occurred on June 15, 1935 (backwater from Colorado River). A flood in 1919 reached a stage of 22 ft (6.7 m), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft<sup>3</sup>/s (14.2 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 29	1030	762	21.6	8.97	2.734	Apr. 20	0200	*2,520	71.4	14.04	4.279
Feb. 11	1230	2,170	61.5	13.22	4.029	Apr. 30	0145	752	21.3	8.93	2.722
Apr. 15	1900	983	27.8	9.80	2.987	Sept. 19	1930	927	26.3	9.60	2.926
Apr. 16	1245	1,720	48.7	12.05	3.673						

Minimum discharge, 0.18 ft<sup>3</sup>/s (0.005 m<sup>3</sup>/s) Aug. 25 to Sept. 6, Sept. 28, 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.9	12	9.4	16	23	24	12	48	11	3.7	.72	.18
2	5.4	9.9	8.8	22	27	24	12	41	11	3.5	.50	.18
3	5.2	9.8	8.2	19	34	114	11	37	10	3.1	.43	.22
4	19	8.4	8.0	17	24	41	13	35	9.3	2.9	.46	.18
5	31	7.3	49	16	22	28	10	30	8.5	2.7	.38	.18
6	8.9	6.9	25	17	22	25	9.7	29	8.1	2.5	.38	.21
7	7.2	6.5	13	15	21	24	9.4	28	7.6	2.3	.38	.38
8	8.6	6.4	12	15	22	23	9.4	26	7.4	2.1	.38	.31
9	6.8	6.0	11	20	20	21	9.1	25	7.1	2.1	.38	.31
10	6.4	6.3	17	15	121	21	9.1	23	6.6	1.8	.31	.31
11	6.2	6.3	135	14	656	21	8.2	22	16	1.8	.31	.31
12	6.2	8.1	76	18	155	19	8.0	21	11	1.6	.31	1.5
13	5.9	28	55	87	104	18	16	19	7.4	1.5	.26	32
14	5.9	8.0	47	34	83	17	13	19	6.2	1.5	.24	4.3
15	26	6.7	40	24	64	17	379	18	21	1.4	.24	.60
16	19	6.1	34	21	56	16	450	18	13	1.5	.18	.39
17	8.6	7.5	31	20	51	16	104	17	7.1	3.7	.33	.31
18	7.3	6.2	28	20	45	15	61	17	6.1	3.1	.38	.24
19	33	48	34	19	40	14	122	18	5.6	1.4	.38	106
20	14	12	28	18	36	13	755	25	4.9	1.3	.40	15
21	9.4	9.7	24	18	34	13	129	67	6.9	1.2	.38	1.6
22	8.4	8.5	24	50	34	13	84	22	6.9	1.2	.31	1.0
23	9.0	8.2	23	59	31	12	62	19	26	1.2	.31	.71
24	38	8.0	21	29	28	13	51	16	14	1.0	.31	.71
25	14	30	21	26	28	14	43	15	7.0	.93	.23	1.2
26	10	28	20	25	26	26	42	14	5.6	.72	.18	.56
27	9.3	12	20	24	25	37	41	13	5.1	.72	.18	.46
28	14	11	19	22	25	28	35	12	4.5	.88	.18	.22
29	244	10	18	21	---	15	34	12	4.4	.93	.18	.24
30	29	9.7	18	28	---	13	157	12	4.1	.93	.18	.24
31	15	---	16	24	---	12	---	11	---	.73	.18	---
TOTAL	636.6	351.5	893.4	773	1857	707	2698.9	729	269.4	55.94	9.97	170.05
MEAN	20.5	11.7	28.8	24.9	66.3	22.8	90.0	23.5	8.98	1.80	.32	5.67
MAX	244	48	135	87	656	114	755	67	26	3.7	.72	106
MIN	5.2	6.0	8.0	14	20	12	8.0	11	4.1	.72	.18	.18
CFSM	.40	.23	.56	.49	1.29	.44	1.75	.46	.18	.04	.006	.11
IN.	.46	.25	.65	.56	1.35	.51	1.96	.53	.20	.04	.01	.12
AC-FT	1260	697	1770	1530	3680	1400	5350	1450	534	111	20	337
(††)	6.00	2.27	2.74	2.03	2.73	2.12	7.11	1.61	2.29	.10	.09	2.13

CAL YR 1976 TOTAL 8210.00 MEAN 22.4 MAX 1220 MIN 1.9 CFSM .44 IN 5.95 AC-FT 16280 †† 41.59  
WTR YR 1977 TOTAL 9151.76 MEAN 25.1 MAX 755 MIN .18 CFSM .49 IN 6.64 AC-FT 18150 †† 32.22

†† Weighted-mean rainfall, in inches, based on six rain gages.

NOTE.--No gage-height record Nov. 16 to Dec. 15.

08158600 WALNUT CREEK AT WEBBERVILLE ROAD, AUSTIN, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1975 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL./100 ML)
NOV 04...	1315	8.4	657	8.0	16.5	0	1	9.6	101	.2	1000	88
JAN 03...	1150	16	634	8.0	6.0	0	1	11.9	98	.8	9500	240
FEB 11...	1000	1220	339	7.9	13.5	10	1900	10.0	99	13	72000	8000
11...	1615	683	335	8.0	15.0	20	750	9.1	93	5.2	28000	15000
12...	0910	155	570	8.1	12.0	5	80	10.4	100	1.4	2400	2100
14...	0945	75	667	8.0	11.0	0	20	10.2	95	.7	8400	600
MAR 01...	1250	24	646	8.0	13.0	0	2	10.1	99	.6	840	60
MAY 16...	1400	16	590	7.9	22.0	0	1	7.7	91	.5	2800	680
JUL 11...	1130	1.8	584	7.5	27.5	0	0	7.8	100	.3	35000	240
SEP 20...	1300	6.9	322	7.8	26.0	20	160	6.9	86	2.6	270000	31000
DATE	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA, MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV 04...	160	300	85	110	6.4	26	.7	2.8	264	0	66	41
JAN 03...	460	--	--	--	--	--	--	--	--	--	--	--
FEB 11...	81000	140	36	51	3.3	11	.4	3.6	128	0	50	11
11...	140000	--	--	--	--	--	--	--	--	--	--	--
12...	9200	--	--	--	--	--	--	--	--	--	--	--
14...	1700	--	--	--	--	--	--	--	--	--	--	--
MAR 01...	96	--	--	--	--	--	--	--	--	--	--	--
MAY 16...	460	260	60	95	5.6	22	.6	2.1	244	0	58	31
JUL 11...	840	--	--	--	--	--	--	--	--	--	--	--
SEP 20...	26000	130	40	47	3.0	11	.4	3.8	110	0	40	14
DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	
NOV 04...	.4	9.6	392	2	1	.73	.01	.01	.18	.00	2.0	
JAN 03...	--	--	--	3	0	.31	.00	.02	.27	.01	3.6	
FEB 11...	.4	9.2	203	4230	456	.64	.01	.15	4.5	1.5	32	
11...	--	--	--	1780	216	.67	.02	.12	8.1	.76	22	
12...	--	--	--	197	34	1.4	.01	.08	.86	.18	12	
14...	--	--	--	29	4	1.5	.00	.07	.64	.02	3.2	
MAR 01...	--	--	--	3	1	1.2	.01	.02	.27	.01	9.0	
MAY 16...	.4	8.3	343	1	1	1.0	.00	.01	.30	.01	5.0	
JUL 11...	--	--	--	1	1	.29	.01	.01	.19	.01	2.5	
SEP 20...	.3	6.9	180	225	34	.70	.01	.00	.40	.21	9.7	

## COLORADO RIVER BASIN

08158600 WALNUT CREEK AT WEBBERVILLE ROAD, AUSTIN, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CAD- MIUM (CD) (UG/L)	DIS-SOLVED CHRO- MIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV 04...	1315	1	100	0	0	0	0
FEB 11...	1000	1	0	0	1	4	30
MAY 16...	1400	0	0	0	10	1	20
SEP 20...	1300	8	0	0	0	1	20

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN- GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELE- NIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV 04...	0	10	.2	0	0	0
FEB 11...	0	0	.0	1	0	10
MAY 16...	1	8	.0	0	0	5
SEP 20...	2	10	.0	0	0	0

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
NOV 04...	1315	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
FEB 11...	1000	.0	.00	.00	.0	.00	.01	.02	.03	.01	.00	.00
MAY 16...	1400	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
SEP 20...	1300	.0	.00	.00	.0	.00	.00	.00	.06	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 04...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
FEB 11...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
MAY 16...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
SEP 20...	.00	.00	.00	.00	.00	.00	.00	0	.00	.03	.03	.00

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	TEMPER- ATURE (DEG C)	SUS- PENDE SEDI- MENT (MG/L)	SUS- PENDE SEDI- MENT DIS- CHARGE (T/DAY)
DEC 15...	1330	39	7.0	42	4.4

COLORADO RIVER BASIN

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08158640 WALNUT CREEK AT SOUTHERN PACIFIC RAILROAD BRIDGE, AUSTIN, TX  
(Reconnaissance partial-record station)

LOCATION.--Lat 30°15'58", long 97°39'24", Travis County, Hydrologic Unit 12090205, at Southern Pacific Railroad bridge, 1.2 mi (1.9 km) south of Webberville Road, and 5.0 mi (8.0 km) east of the State Capitol in Austin.

DRAINAGE AREA.--53.5 mi<sup>2</sup> (138.6 km<sup>2</sup>).

PERIOD OF RECORD.--Periodic chemical, biochemical, and pesticide analyses: January 1975 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL.-MF / 100 ML)
NOV 03...	1000	23	757	7.6	14.5	10	5	9.4	95	7.6	0	0
JAN 03...	1030	27	745	7.9	5.5	5	6	11.6	95	2.9	0	0
FEB 11...	1105	1360	318	8.0	13.5	20	1600	9.6	95	13	74000	5600
11...	1650	569	354	7.9	17.0	20	750	9.0	96	12	35000	14000
12...	1002	152	618	8.0	13.0	10	65	9.4	92	7.8	4400	480
14...	1025	78	724	8.0	12.0	0	20	9.7	93	7.1	6400	110
MAR 01...	1400	29	730	8.0	16.5	10	4	9.6	101	16	0	0
MAY 17...	1130	23	710	7.7	22.5	5	3	5.9	69	25	4	0
JUL 11...	1115	13	606	7.1	27.5	5	2	3.6	46	8.7	20000	31
SEP 20...	1420	37	588	7.7	28.0	15	50	6.6	85	10	22000	2800
DATE	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV 03...	0	230	53	77	10	59	1.7	6.5	220	0	79	70
JAN 03...	2	--	--	--	--	--	--	--	--	--	--	--
FEB 11...	66000	140	31	49	3.3	11	.4	3.6	128	0	42	11
11...	250000	--	--	--	--	--	--	--	--	--	--	--
12...	600	--	--	--	--	--	--	--	--	--	--	--
14...	380	--	--	--	--	--	--	--	--	--	--	--
MAR 01...	0	--	--	--	--	--	--	--	--	--	--	--
MAY 17...	9	250	47	87	8.1	46	1.3	4.2	248	0	73	50
JUL 11...	170	--	--	--	--	--	--	--	--	--	--	--
SEP 20...	1900	130	41	31	13	64	2.4	6.4	110	0	78	71
DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SI02) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	
NOV 03...	2.1	10	422	19	13	2.0	.26	2.2	2.2	3.5	7.2	
JAN 03...	--	--	--	11	10	.30	.08	1.6	7.5	2.0	13	
FEB 11...	.4	9.6	193	3880	344	.54	.02	.37	12	1.4	32	
11...	--	--	--	1750	236	.66	.02	.58	5.3	1.0	29	
12...	--	--	--	150	33	1.2	.03	2.0	1.8	.90	6.8	
14...	--	--	--	35	5	1.2	.06	3.0	1.1	1.3	7.3	
MAR 01...	--	--	--	8	6	.96	.14	3.6	3.8	1.9	9.4	
MAY 17...	1.2	9.6	402	7	3	.85	.95	3.4	3.3	2.0	7.8	
JUL 11...	--	--	--	7	3	.62	.68	.44	.76	4.3	6.8	
SEP 20...	1.4	9.5	329	78	14	.13	.03	.69	2.5	5.0	10	

## COLORADO RIVER BASIN

08158640 WALNUT CREEK AT SOUTHERN PACIFIC RAILROAD BRIDGE, AUSTIN, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CAD- MIUM (CD) (UG/L)	DIS-SOLVED CHRO- MIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV 03...	1000	1	0	1	0	4	0
FEB 11...	1105	2	0	0	1	3	20
MAY 17...	1130	1	0	0	0	1	220
SEP 20...	1420	4	0	0	0	2	20

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN- GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELE- NIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV 03...	2	10	.2	0	0	10
FEB 11...	0	0	.0	1	0	0
MAY 17...	0	6	.0	0	0	10
SEP 20...	1	1	.0	0	0	0

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
NOV 03...	1000	.0	.00	.00	.0	.00	.00	.00	.11	.00	.00	.00
FEB 11...	1105	.0	.00	.00	.0	.00	.01	.02	.05	.00	.00	.00
MAY 17...	1130	.0	.00	.00	.0	.00	.00	.00	.13	.00	.00	.00
SEP 20...	1420	.0	.00	.00	.0	.00	.00	.00	.17	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 03...	.00	.00	.00	.00	.00	.00	.00	0	.00	--	--	--
FEB 11...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
MAY 17...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.01	.00
SEP 20...	.00	.00	.00	.00	.00	.00	.00	0	.00	.03	.01	.00





## COLORADO RIVER BASIN

08158650 COLORADO RIVER BELOW AUSTIN, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILT-RABLE RESIDUE (MG/L)	VOL. NON-FILT-RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 13...	1.0	9.6	324		1	.23	.11	.89	1.7	1.3	3.6
NOV 09...	--	--	--	6	2	.34	.14	1.2	2.0	1.2	5.1
DEC 14...	.4	9.2	299	15	0	.46	.07	.37	.19	.25	15
JAN 17...	--	--	--	63	4	.38	.03	.51	.44	.26	2.6
FEB 15...	.3	8.2	311	12	2	.37	.04	.37	.38	.21	4.2
MAR 07...	--	--	--	31	3	.28	.04	.66	.34	.29	7.2
APR 12...	.2	8.3	308	12	2	.36	.03	.17	.42	.20	5.1
MAY 18...	--	--	--	11	2	.29	.01	.09	--	.05	3.8
JUN 14...	.2	7.6	271	14	2	.28	.03	.21	.09	.17	4.7
JUL 18...	--	--	--	4	0	.35	.04	.16	.32	.14	3.0
AUG 16...	.2	9.7	298	6	2	.12	.03	.07	.43	.18	2.7
SEP 06...	--	--	--	4	0	.24	.04	.19	.11	.16	3.2

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT 13...	1032	2	0	2	0	3	0
FEB 15...	0918	1	100	0	0	2	10
JUN 14...	1035	2	0	1	0	2	30
AUG 16...	0915	0	0	1	0	1	20

DATE	TIME	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT 13...		0	20	.1	0	0	10
FEB 15...		0	0	.1	0	0	0
JUN 14...		1	0	.0	0	0	0
AUG 16...		4	0	.0	0	0	8

DATE	TIME	TOTAL PCB (UG/L)	POLY-CHLO-RINATED NAPH-THALENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR-DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
OCT 13...	1032	.0	.00	.00	.0	.00	.00	.00	.10	.00	.00	.00
FEB 15...	0918	.0	.00	.00	.0	.00	.00	.00	.03	.00	.00	.00
JUN 14...	1035	.0	.00	.00	.0	.00	.00	.00	.02	.00	.00	.00
AUG 16...	0915	.0	.00	.00	.0	.00	.00	.00	.02	.00	.00	.00

DATE	TOTAL HEPTA-CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA-THION (UG/L)	TOTAL METHYL PARA-THION (UG/L)	TOTAL METHYL TRI-THION (UG/L)	TOTAL PARA-THION (UG/L)	TOTAL TOX-APHENE (UG/L)	TOTAL TRI-THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 13...	.00	.00	.00	.00	.00	.00	0	.00	.01	.01	.00
FEB 15...	.00	.00	.00	.00	.00	.00	0	.00	.05	.00	.00
JUN 14...	.00	.00	.00	.00	.00	.00	0	.00	.21	.01	.00
AUG 16...	.00	.00	.00	.00	.00	.00	0	.00	.19	.00	.00

## COLORADO RIVER BASIN

185

08158700 ONION CREEK NEAR DRIFTWOOD, TX  
(Reconnaissance partial-record station)

LOCATION.--Lat 30°05'00", Long 98°00'20", Hays County, Hydrologic Unit 12090205, at bridge at lower crossing on Farm Road 150, 3.2 mi (5.1 km) southeast of Driftwood, and 10 mi (16 km) west of Buda.

PERIOD OF RECORD.--Occasional discharge measurements: April 1958, November 1961 to current year. Occasional water-quality data: January 1974 to current year.

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIO-CHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA, MG) (MG/L)
OCT 12...	1154	7.7	459	7.6	19.0	0	0	9.0	100	.7	240
NOV 08...	1240	50	457	8.1	16.5	0	0	9.9	104	.3	240
DEC 13...	1329	94	490	7.8	12.0	0	1	10.6	102	.2	250
JAN 20...	0919	64	500	7.8	7.0	0	0	11.5	97	.2	260
FEB 14...	1622	195	508	7.8	16.5	0	1	9.7	102	.0	260
MAR 10...	0958	74	584	7.7	15.0	0	0	9.8	100	.7	240
APR 11...	1318	31	458	8.1	21.0	0	0	9.8	113	.6	240
MAY 19...	1235	83	469	7.7	22.0	0	0	8.6	101	.1	250
JUN 16...	0915	24	449	8.0	26.0	0	0	7.7	96	.6	230
JUL 21...	0830	4.6	420	7.9	27.5	0	1	7.2	92	.5	210
AUG 15...	1017	1.2	406	7.7	27.5	0	0	6.7	86	.2	190
SEP 09...	1000	2.1	376	8.0	26.0	0	1	7.1	89	.8	190

DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 12...	31	68	16	7.5	.2	1.2	250	0	23	12	.3
NOV 08...	20	69	16	6.9	.2	1.1	266	0	18	10	.3
DEC 13...	24	73	17	6.9	.2	.9	278	0	23	11	.2
JAN 20...	38	78	17	7.3	.2	1.0	276	0	26	11	.1
FEB 14...	21	77	16	7.0	.2	1.0	289	0	23	10	.2
MAR 10...	19	68	17	7.8	.2	.9	269	0	26	12	.2
APR 11...	40	67	18	8.4	.2	1.1	246	0	28	13	.1
MAY 19...	30	72	16	7.1	.2	1.0	263	0	26	12	.2
JUN 16...	31	65	16	7.7	.2	1.1	240	0	30	15	.2
JUL 21...	28	57	16	8.6	.3	1.2	220	0	27	16	.2
AUG 15...	27	50	16	8.9	.3	1.3	200	0	27	14	.2
SEP 09...	30	48	16	8.1	.3	1.4	190	0	27	17	.2

## COLORADO RIVER BASIN

08158700 ONION CREEK NEAR DRIFTWOOD, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 12...	8.9	260	0	0	.01	.00	.00	.10	.00	.6
NOV 08...	8.1	261	0	0	.04	.00	.00	.16	.01	.8
DEC 13...	8.5	278	7	1	.19	.00	.01	.02	.02	2.5
JAN 20...	7.6	284	1	0	.23	.00	.00	.04	.01	2.8
FEB 14...	8.1	285	1	0	.25	.00	.01	.06	.01	3.8
MAR 10...	7.7	272	0	0	.13	.00	.00	.02	.00	7.1
APR 11...	8.4	265	1	0	.04	.00	.01	.12	.00	5.2
MAY 19...	7.5	271	0	0	.17	.00	.00	--	.00	1.5
JUN 16...	8.8	262	0	0	.04	.01	.01	.00	.04	1.4
JUL 21...	11	245	0	0	.01	.01	.00	.10	.02	2.7
AUG 15...	13	229	0	0	.01	.00	.01	.39	.03	1.5
SEP 09...	12	223	1	0	.03	.00	.01	.19	.00	2.1

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
OCT 12...	1154	0	0	14	0	0	0
FEB 14...	1622	0	100	0	0	0	0
JUN 16...	0915	0	0	0	0	0	30
AUG 15...	1017	0	0	1	0	0	10

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
OCT 12...	3	20	.0	0	0	10
FEB 14...	0	10	.1	1	0	0
JUN 16...	0	8	.0	0	0	0
AUG 15...	2	0	.0	0	0	10

## COLORADO RIVER BASIN

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08158920 WILLIAMSON CREEK AT OAK HILL, TX  
(Reconnaissance partial-record station)

LOCATION.--Lat 30°14'06", long 97°51'36", Travis County, Hydrologic Unit 12090205, at U.S. Highway 290 road crossing in Oak Hill and 7.7 mi (12.4 km) southwest of the State Capitol at Austin.

PERIOD OF RECORD.--Occasional discharge measurements and water-quality data: January 1974 to current year.

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA+MG) (MG/L)
NOV 08...	1050	.74	679	8.0	15.0	2	0	11.8	120	.6	340
DEC 13...	1536	7.0	611	8.0	13.0	1	0	11.8	116	.4	320
JAN 20...	1112	2.1	655	8.0	8.5	1	0	14.6	129	.8	330
FEB 14...	1840	11	624	7.7	15.5	1	1	8.7	90	.5	320
MAR 03...	1015	12	591	7.3	15.0	3	2	9.0	92	2.5	290
APR 11...	1122	.17	650	8.2	19.5	1	0	11.7	131	.3	330
MAY 15...	1120	43	325	7.8	16.5	20	40	8.1	85	2.9	160
MAY 19...	1030	1.1	655	7.8	22.0	1	0	9.1	107	.6	340

DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV 08...	41	93	26	18	.4	1.6	364	0	37	29	.4
DEC 13...	34	86	25	11	.3	.9	346	0	27	20	.2
JAN 20...	42	91	26	14	.3	1.2	356	0	34	25	.1
FEB 14...	30	85	25	11	.3	1.0	348	0	30	19	.2
MAR 03...	24	76	24	12	.3	1.5	322	0	29	19	.1
APR 11...	29	86	27	18	.4	.5	362	0	31	32	.2
MAY 15...	16	44	13	5.2	.2	2.2	180	0	13	8.8	.1
MAY 19...	32	93	25	13	.3	1.4	370	0	30	20	.2

DATE	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
NOV 08...	4.8	389	0	0	.08	.03	.02	.23	.38	2.4
DEC 13...	6.5	347	0	0	.33	.02	.04	.16	.13	3.6
JAN 20...	3.4	370	0	0	.38	.03	.04	.19	.28	1.4
FEB 14...	6.8	350	1	0	.31	.02	.05	.21	.12	2.6
MAR 03...	4.5	325	4	1	.31	.03	.08	.23	.33	3.0
APR 11...	6.6	380	1	1	.01	.00	.02	.25	.37	4.7
MAY 15...	5.9	181	57	6	.25	.02	.08	.82	.24	7.2
MAY 19...	6.9	372	0	0	.58	.05	.01	--	.34	2.1

## COLORADO RIVER BASIN

08158920 WILLIAMSON CREEK AT OAK HILL, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
DEC 13...	1536	1	0	0	10	0	60
FEB 14...	1840	0	0	0	0	9	10
APR 15...	1120	1	0	0	7	0	20

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
DEC 13...	0	20	.0	0	0	20
FEB 14...	0	20	.1	0	0	0
APR 15...	0	10	.0	0	0	0

## 08158970 WILLIAMSON CREEK AT JIMMY CLAY ROAD, AUSTIN, TX

LOCATION.--Lat 30°11'21", long 97°43'56", Travis County, Hydrologic Unit 12090205, at Jimmy Clay Road, 0.5 mi (0.8 km) southeast of the Intersection of Jimmy Clay and Nuckles Crossing Roads, and 5.9 mi (9.5 km) south of the State Capitol in Austin.

DRAINAGE AREA.--27.6 mi<sup>2</sup> (71.5 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1974 to September 1975 (periodic discharge measurements only), September 1975 to current year.

GAGE.--Water-stage recorder. Datum of gage is 497.18 ft (151.540 m) above mean sea level, from city of Austin bench mark.

REMARKS.--Water-discharge records good above 50 ft<sup>3</sup>/s (1.42 m<sup>3</sup>/s) and fair below. No known regulation or diversion above station. There are two recording rain gages located in the watershed. The station is part of a hydrologic research project to study the rainfall-runoff relationships for the Austin urban-rural areas.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,100 ft<sup>3</sup>/s (286 m<sup>3</sup>/s) Nov. 23, 1974, gage height, 15.2 ft (4.63 m), from floodmark, by slope-area measurement; minimum not determined.

EXTREMES OUTSIDE PERIOD OF RECORD.--The maximum flood since 1869 occurred on Sept. 9 or 10, 1921, stage and discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 891 ft<sup>3</sup>/s (25.2 m<sup>3</sup>/s) Sept. 19, gage height, 6.36 ft (1.939 m), from floodmark, no peak above base of 950 ft<sup>3</sup>/s (26.9 m<sup>3</sup>/s); minimum, 0.03 ft<sup>3</sup>/s (0.001 m<sup>3</sup>/s) Sept. 16, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.63	5.0	2.7	4.0	4.6	7.1	1.7	7.1	13	.54	.10	.17
2	.54	4.3	2.7	5.2	5.4	7.4	1.9	6.7	2.7	.38	.10	.10
3	.46	2.8	2.7	5.1	8.1	39	1.8	6.9	2.0	.38	.10	.08
4	16	2.5	2.7	4.4	5.1	16	2.6	6.8	1.7	.38	.06	.10
5	34	2.4	11	3.9	4.4	5.9	1.7	6.3	1.7	.38	.06	.10
6	2.7	2.4	16	4.5	4.2	5.0	1.5	6.3	1.6	.38	.06	.08
7	1.8	2.7	5.6	4.2	4.4	4.7	1.5	6.1	1.4	.38	.08	.08
8	2.2	2.5	4.4	4.0	4.9	4.6	1.7	6.0	1.2	.38	.10	.06
9	1.6	2.6	4.0	4.9	5.1	5.1	1.7	5.8	1.2	.38	.08	.06
10	1.3	2.6	11	4.2	29	5.1	1.6	6.6	1.2	.38	.08	.06
11	1.3	2.6	46	4.0	147	5.3	1.6	6.1	1.2	.38	.08	.06
12	1.2	2.4	13	5.3	42	5.3	1.6	5.3	1.2	.32	.08	.06
13	1.0	7.3	9.6	26	16	5.1	22	5.2	1.0	.32	.10	4.4
14	1.3	4.1	7.6	9.0	11	6.3	16	5.4	.93	.21	.12	6.7
15	21	2.5	6.6	5.2	8.3	6.2	175	5.1	1.9	.21	.15	.10
16	22	2.3	5.3	4.3	7.3	6.0	254	5.0	1.4	.24	.16	.03
17	3.6	4.0	5.1	4.3	6.4	5.6	49	4.9	1.0	.21	.17	.04
18	2.4	2.8	5.0	4.3	6.0	5.0	22	4.9	.82	.21	.12	.04
19	20	27	5.3	4.1	5.2	4.5	14	5.0	.72	.21	.11	90
20	7.6	6.9	5.0	4.2	5.0	3.9	154	5.2	.63	.23	.13	30
21	3.2	3.9	4.4	4.1	5.1	4.0	40	16	.63	.21	.13	.32
22	2.4	3.3	4.4	14	5.3	3.6	21	4.6	2.0	.17	.13	.21
23	2.7	3.1	4.3	19	5.1	3.4	13	2.8	5.6	.16	.16	.10
24	10	3.2	4.0	5.3	4.6	3.5	10	2.4	7.4	.17	.20	.03
25	5.6	4.4	4.1	4.2	5.3	3.3	8.9	2.2	1.6	.17	.21	.04
26	3.2	8.5	3.9	4.0	5.3	4.5	8.1	2.0	1.0	.17	.19	.13
27	2.4	4.0	3.8	3.8	6.0	13	7.6	2.0	.72	.17	.19	.26
28	4.1	3.9	3.9	3.5	7.5	7.1	7.1	1.9	.63	.21	.29	.27
29	155	3.5	3.7	3.3	---	2.9	7.1	1.9	.93	.17	.34	.40
30	18	2.7	3.9	5.9	---	2.1	7.4	1.9	1.0	.17	.39	.56
31	6.6	---	4.0	6.9	---	1.9	---	2.5	---	.12	.29	---
TOTAL	355.83	132.2	215.7	189.1	373.6	202.4	857.1	156.9	60.01	8.39	4.56	134.64
MEAN	11.5	4.41	6.96	6.10	13.3	6.53	28.6	5.06	2.00	.27	.15	4.49
MAX	155	27	46	26	147	39	254	16	13	.54	.39	.90
MIN	.46	2.3	2.7	3.3	4.2	1.9	1.5	1.9	.63	.12	.06	.03
CFSM	.42	.16	.25	.22	.48	.24	1.04	.18	.07	.01	.005	.16
IN.	.48	.18	.29	.25	.50	.27	1.16	.21	.08	.01	.01	.18
AC-FT	706	262	428	375	741	401	1700	311	119	17	9.0	267
(††)	7.44	2.16	1.96	2.60	2.38	1.98	5.96	2.40	1.29	.04	.14	4.60

CAL YR 1976 TOTAL 3655.84 MEAN 9.99 MAX 902 MIN .38 CFSM .36 IN 4.93 AC-FT 7250 †† 43.47  
WTR YR 1977 TOTAL 2690.43 MEAN 7.37 MAX 254 MIN .03 CFSM .27 IN 3.63 AC-FT 5340 †† 32.95

†† Weighted-mean rainfall, in inches, based on two rain gages.

NOTE.--No gage-height record Sept. 19-24.



## COLORADO RIVER BASIN

08158970 WILLIAMSON CREEK AT JIMMY CLAY ROAD, AUSTIN, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Periodic chemical, biochemical, and pesticide analyses: January 1975 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL.-MF (COL./ 100 ML)
DATE	TIME			(UNITS)								
NOV 02...	1325	5.3	596	7.6	15.5	5	4	5.0	52	.3	1700	680
JAN 03...	1345	4.4	660	7.8	8.0	5	2	12.4	108	.9	1400	36
MAR 01...	0915	6.6	667	7.7	11.0	5	1	10.0	93	1.8	2200	200
APR 15...	1045	124	284	7.7	17.5	20	95	8.0	86	5.4	120000	8800
15...	1530	112	205	8.0	16.5	30	750	8.2	86	6.5	220000	36000
18...	1225	17	553	7.7	19.0	10	10	8.2	91	1.8	10000	600
MAY 16...	1300	5.0	666	7.7	22.0	0	3	7.4	87	1.1	14000	480
JUL 12...	1115	.32	730	8.2	27.0	5	1	8.1	103	.9	17000	580
SEP 20...	1005	5.1	370	7.6	22.5	20	250	6.8	80	3.1	410000	56000
DATE	FECAL STREP- TOCOC- KI AGAR (COL. PER 100 ML)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
NOV 02...	220	260	37	92	8.5	22	.6	2.8	278	0	44	27
JAN 03...	92	--	--	--	--	--	--	--	--	--	--	--
MAR 01...	120	--	--	--	--	--	--	--	--	--	--	--
APR 15...	53000	--	--	--	--	--	--	--	--	--	--	--
15...	300000	91	16	33	2.1	5.4	.2	2.7	92	0	18	5.8
18...	1800	--	--	--	--	--	--	--	--	--	--	--
MAY 16...	620	290	27	98	10	29	.7	2.0	316	0	42	34
JUL 12...	520	--	--	--	--	--	--	--	--	--	--	--
SEP 20...	43000	150	39	51	4.5	11	.4	4.0	130	0	50	13
DATE	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	
NOV 02...	1.2	12	347	6	2	.48	.02	.40	.27	.07	4.4	
JAN 03...	--	--	--	2	2	.11	.01	.13	.34	.08	3.4	
MAR 01...	--	--	--	1	1	.41	.03	.31	.33	.06	4.5	
APR 15...	--	--	--	236	4	.34	.02	.11	1.3	.20	11	
15...	.1	5.5	118	1880	210	.44	.03	.13	3.8	.61	58	
18...	--	--	--	23	4	.48	.01	.12	.44	.07	3.2	
MAY 16...	.5	11	383	7	1	.59	.06	.30	.57	.02	2.4	
JUL 12...	--	--	--	6	2	.97	.13	.15	.28	.02	3.7	
SEP 20...	.4	9.1	207	355	47	.69	.01	.12	.66	.34	10	

COLORADO RIVER BASIN

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08158970 WILLIAMSON CREEK AT JIMMY CLAY ROAD, AUSTIN, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
NOV 02...	1325	3	100	0	0	0	0
APR 15...	1530	2	0	0	5	2	10
MAY 16...	1300	2	100	0	0	0	0
SEP 20...	1005	2	0	0	10	1	20

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
NOV 02...	0	150	.3	0	0	0
APR 15...	0	10	.0	0	0	10
MAY 16...	0	110	.0	0	0	10
SEP 20...	0	30	.0	0	0	10

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
NOV 02...	1325	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
APR 15...	1530	.0	.00	.00	.0	.01	.01	.04	.13	.00	.00	.00
MAY 16...	1300	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
SEP 20...	1005	.0	.00	.00	.0	.00	.00	.01	.47	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 02...	.00	.00	.00	.00	.00	.00	.00	0	.00	.26	.02	.00
APR 15...	.00	.00	.00	.00	.00	.00	.00	0	.00	.03	.05	.01
MAY 16...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
SEP 20...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.01	.00

## COLORADO RIVER BASIN

08159000 ONION CREEK AT U.S. HIGHWAY 183 NEAR AUSTIN, TX

LOCATION.--Lat 30°10'40", long 97°41'18", Travis County, Hydrologic Unit 12090205, on right bank at downstream side of downstream bridge on U.S. Highway 183, 2.4 mi (3.9 km) downstream from Williamson Creek, 3.2 mi (5.1 km) southwest of Del Valle, and 7.3 mi (11.7 km) southeast of the State Capitol Building in Austin.

DRAINAGE AREA.--321 mi<sup>2</sup> (831 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1924 to March 1930, March 1976 to current year. Discharge records for the period 1924-30 were published as monthly and annual figures in WSP 1312 as Onion Creek near Del Valle.

GAGE.--Water-stage recorder. Datum of gage is 442.85 ft (134.981 m) above mean sea level (Texas State Department of Highways and Public Transportation bench mark). May 15, 1924, to Mar. 15, 1930, nonrecording gage at highway bridge 1,700 ft (518 m) upstream at 6.42 ft (1.96 m) higher datum.

REMARKS.--Records fair. Flow is slightly regulated by several small ponds on main channel and tributaries above station.

AVERAGE DISCHARGE.--6 years (water years 1925-29, 1977), 84.1 ft<sup>3</sup>/s (2.382 m<sup>3</sup>/s), 3.56 in/yr (90 mm/yr), 60,930 acre-ft/yr (75.1 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 76,000 ft<sup>3</sup>/s (2,150 m<sup>3</sup>/s) May 28, 1929, gage height, 30.5 ft (9.30 m), present datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stages since 1869 occurred about July 3, 1869, stage about 38 ft (11.6 m) from newspaper accounts, and Sept. 9, 1921, stage 38.0 ft (11.58 m) from floodmark, present site and datum.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,500 ft<sup>3</sup>/s (70.8 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 16	2345	3,730 106	12.72 3.877	Apr. 20	1345	*4,780 135	14.45 4.404

Minimum daily discharge, 0.87 ft<sup>3</sup>/s (0.025 m<sup>3</sup>/s) Aug. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	11	86	31	46	82	93	38	193	58	13	4.0	3.0		
2	10	67	30	49	80	93	37	178	46	12	4.0	3.0		
3	7.7	53	30	58	108	158	35	168	40	11	4.0	3.6		
4	9.1	42	29	59	97	169	37	141	38	10	3.6	4.3		
5	150	35	63	55	90	108	33	136	38	10	3.3	5.0		
6	36	32	124	52	86	93	29	130	35	10	3.3	5.6		
7	17	31	60	50	85	87	27	127	32	9.6	3.0	6.4		
8	16	29	48	47	85	83	26	122	29	9.1	2.4	7.8		
9	13	29	47	49	86	81	25	118	27	9.1	2.4	7.8		
10	12	29	50	46	143	79	25	117	26	6.2	2.4	8.2		
11	11	28	263	42	991	78	25	115	25	5.4	2.2	8.2		
12	10	26	106	45	430	74	24	111	25	5.0	2.2	8.2		
13	10	36	93	122	263	68	34	108	24	6.6	2.2	12		
14	9.2	34	84	109	220	65	54	104	22	4.3	1.9	23		
15	29	29	83	85	192	64	608	99	22	4.1	1.8	11		
16	201	27	80	72	177	61	2880	96	29	4.6	1.6	8.7		
17	42	34	74	64	171	59	1660	90	22	4.6	1.4	9.1		
18	21	34	70	62	161	58	944	87	20	5.7	1.4	8.7		
19	39	121	71	60	150	56	608	82	19	6.6	1.4	57		
20	61	82	74	61	140	55	2020	82	19	6.6	1.4	27		
21	27	47	67	61	134	52	1190	88	18	6.6	1.2	6.3		
22	19	43	62	71	133	48	841	80	19	6.2	1.2	4.2		
23	17	36	62	166	131	48	624	75	22	6.2	1.2	4.0		
24	515	33	62	99	118	47	479	69	24	6.2	.90	4.3		
25	114	33	62	81	111	47	389	65	18	5.8	.87	3.6		
26	55	74	62	75	105	51	325	60	16	5.8	.90	3.6		
27	39	47	57	74	99	74	277	57	15	6.2	1.1	4.0		
28	33	35	55	71	97	74	244	54	14	6.2	1.2	4.0		
29	977	33	54	68	---	60	222	52	13	6.0	1.2	4.0		
30	296	32	51	71	---	51	210	49	14	5.4	1.6	4.3		
31	127	---	47	94	---	41	---	46	---	5.2	2.7	---		
TOTAL	2934.0	1297	2151	2164	4765	2275	13970	3099	769	219.3	63.97	269.9		
MEAN	94.6	43.2	69.4	69.8	170	73.4	466	100	25.6	7.07	2.06	9.00		
MAX	977	121	263	166	991	169	2880	193	58	13	4.0	57		
MIN	7.7	26	29	42	80	41	24	46	13	4.1	.87	3.0		
CFSM	.30	.14	.22	.22	.53	.23	1.45	.31	.08	.02	.006	.03		
IN.	.34	.15	.25	.25	.55	.26	1.62	.36	.09	.03	.01	.03		
AC-FT	5820	2570	4270	4290	9450	4510	27710	6150	1530	435	127	535		
WTR YR 1977	TOTAL	33977.17	MEAN	93.1	MAX	2880	MIN	.87	CFSM	.29	IN	3.94	AC-FT	67390

COLORADO RIVER BASIN

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08159000 ONION CREEK AT U.S. HIGHWAY 183 NEAR AUSTIN, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1976 to current year. Sediment analyses: October 1976 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL./100 ML)
OCT 13...	0920	10	560	8.0	19.5	3	7	8.6	97	.8	330	62
NOV 08...	1420	34	577	8.0	17.0	1	10	9.8	104	.5	180	37
DEC 14...	0948	83	592	7.9	11.0	4	8	10.4	97	.7	2100	260
JAN 17...	0935	64	603	8.0	7.0	4	5	11.2	95	.8	390	52
FEB 15...	1014	192	514	7.8	12.0	2	7	10.3	99	.3	320	55
MAR 07...	1254	87	511	7.8	15.0	1	3	10.6	108	1.1	88	24
APR 12...	1305	24	603	8.0	22.5	2	5	9.5	112	.7	220	56
MAY 18...	1303	76	476	7.6	23.0	2	5	8.0	95	.5	6200	59
JUN 13...	1350	24	552	7.6	30.0	0	5	9.2	123	.8	4800	12
JUL 18...	1100	5.7	562	7.9	29.0	1	1	8.6	113	.5	25000	22
AUG 15...	1450	1.8	586	8.1	32.0	1	2	10.2	140	.3	8000	58
SEP 06...	1150	5.6	649	7.9	28.0	4	1	6.9	88	.6	5400	74
DATE	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT 13...	140	220	12	70	11	31	.9	2.6	254	0	25	37
NOV 08...	60	250	23	82	11	25	.7	2.6	277	0	37	28
DEC 14...	440	250	32	88	8.3	25	.7	3.0	270	0	52	26
JAN 17...	110	270	46	89	11	31	.8	2.5	270	0	60	51
FEB 15...	180	240	22	76	13	12	.3	1.7	270	0	30	15
MAR 07...	20	230	23	68	14	18	.5	1.6	249	0	39	21
APR 12...	420	250	21	77	13	31	.9	2.2	274	0	39	35
MAY 18...	92	220	25	67	13	15	.4	1.4	239	0	32	18
JUN 13...	180	220	5	66	13	30	.9	2.0	260	0	34	32
JUL 18...	290	200	2	58	13	42	1.3	2.4	240	0	25	45
AUG 15...	12	190	0	50	15	50	1.6	2.7	230	0	21	60
SEP 06...	150	200	0	53	17	59	1.8	3.0	260	0	16	73

08159000 ONION CREEK AT U.S. HIGHWAY 183 NEAR AUSTIN, TX--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILT- RABLE RESIDUE (MG/L)	VOL. NON-FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 13...	.4	10	312	9	1	.28	.01	.02	.32	.01	3.7
NOV 08...	.4	9.9	332	13	3	.24	.01	.03	.30	.01	2.4
DEC 14...	.3	9.5	345	12	2	.89	.01	.06	.29	.02	5.6
JAN 17...	.2	8.1	386	7	2	.88	.01	.09	.17	.02	2.4
FEB 15...	.2	8.5	290	10	2	.49	.00	.04	.16	.01	4.6
MAR 07...	.2	7.7	292	4	1	.58	.00	.07	.03	.01	8.0
APR 12...	.2	10	342	7	1	.94	.06	.16	.24	.01	4.9
MAY 18...	.2	8.2	273	5	1	.53	.01	.10	--	.01	1.7
JUN 13...	.3	12	318	6	0	.80	.04	.13	.07	.04	2.6
JUL 18...	.3	15	319	1	0	.46	.02	.02	.28	.01	2.3
AUG 15...	.4	18	330	2	1	.15	.01	.01	.49	.03	3.1
SEP 06...	.3	18	367	1	0	.48	.01	.04	.16	.01	7.4

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT 13...	0920	1	100	2	0	0	0
FEB 15...	1014	1	100	0	0	0	10
JUN 13...	1350	1	0	3	0	0	20
AUG 15...	1450	1	0	1	0	0	0

DATE	TIME	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT 13...		1	20	.1	0	0	10
FEB 15...		0	10	.1	0	0	0
JUN 13...		1	20	.0	1	0	0
AUG 15...		0	0	.0	0	0	6

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLOR- NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ENDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
OCT 13...	0920	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
FEB 15...	1014	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
JUN 13...	1350	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
AUG 15...	1450	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 13...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
FEB 15...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
JUN 13...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
AUG 15...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

COLORADO RIVER BASIN

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08159000 ONION CREEK AT U.S. HIGHWAY 183 NEAR AUSTIN, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	TEMPER- ATURE (DEG C)	SUS- PENDE SEDI- MENT (MG/L)	SUS- PENDE SEDI- MENT DIS- CHARGE (T/DAY)
NOV 03...	0805	10	14.0	20	.54
MAR 09...	1200	82	8.5	36	8.0
APR 22...	1100	1020	13.0	27	74
MAY 17...	1400	308	23.0	37	31
SEP 21...	1429	20	27.0	29	1.6



## COLORADO RIVER BASIN

08159150 WILBARGER CREEK NEAR PFLUGERVILLE, TX

LOCATION.--Lat 30°27'16", long 97°36'02", Travis County, Hydrologic Unit 12090301, on left bank downstream from county road (Pfluger Lane), 800 ft (240 m) downstream from Farm Road 685, 1.6 mi (2.6 km) northeast of Pflugerville, and 1.9 mi (3.1 km) downstream from Missouri-Kansas-Texas Railroad.

DRAINAGE AREA.--4.61 mi<sup>2</sup> (11.9 km<sup>2</sup>).

PERIOD OF RECORD.--August 1963 to current year.

Water-quality records: Chemical, biochemical, and pesticide analyses: October 1970 to September 1971.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 670.61 ft (204.402 m) above mean sea level.

REMARKS.--Records good. Station is part of a hydrologic research project to study rainfall-runoff relations for small urban-rural areas. Two recording rain gages are located in watershed. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--14 years, 1.98 ft<sup>3</sup>/s (0.056 m<sup>3</sup>/s), 5.83 in/yr (148 mm/yr), 1,430 acre-ft/yr (1.76 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,760 ft<sup>3</sup>/s (49.8 m<sup>3</sup>/s) June 16, 1964, gage height, 6.92 ft (2.109 m); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1894, occurred in September 1921, stage unknown, from information by local residents, discharge 2,300 ft<sup>3</sup>/s (65.1 m<sup>3</sup>/s), from Corps of Engineers publication "Flood Plain Information, Williamson Creek, Austin, Texas."

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 405 ft<sup>3</sup>/s (11.5 m<sup>3</sup>/s) Feb. 11, gage height, 3.71 ft (1.131 m), no other peak above base of 400 ft<sup>3</sup>/s (11.3 m<sup>3</sup>/s); no flow Oct. 1-3, July 10 to Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.77	1.5	1.3	1.9	1.6	.78	5.2	.44	.03	.00	.00
2	.00	.68	1.4	1.9	2.0	1.6	.93	4.0	.32	.02	.00	.00
3	.00	.60	1.2	2.3	3.6	9.8	.79	3.1	.23	.02	.00	.00
4	.01	.53	1.2	2.2	2.4	4.5	.59	2.7	.20	.02	.00	.00
5	.03	.47	2.2	1.7	1.9	2.9	.53	2.4	.15	.02	.00	.00
6	.01	.43	4.5	1.6	1.8	2.1	.44	2.0	.17	.01	.00	.00
7	.02	.43	2.2	1.6	1.7	1.8	.45	1.8	.16	.01	.00	.00
8	.02	.43	1.9	1.5	1.7	1.8	.42	1.5	.14	.01	.00	.00
9	.01	.43	1.7	2.0	1.8	1.6	.41	2.1	.12	.01	.00	.00
10	.01	.43	3.6	1.3	11	1.6	.36	2.0	.11	.00	.00	.00
11	.02	.42	35	1.4	95	1.7	.37	1.4	.12	.00	.00	.00
12	.01	.44	13	1.7	14	1.2	.33	1.3	.12	.00	.00	.00
13	.02	.85	8.7	6.3	8.6	1.1	.47	1.1	.10	.00	.00	.00
14	.02	.60	7.4	4.2	6.6	.99	.53	.95	.09	.00	.00	.00
15	.03	.53	6.6	3.0	4.8	1.0	39	.82	.19	.00	.00	.00
16	.03	.49	5.4	2.4	4.2	.86	64	.80	.17	.00	.00	.00
17	.02	.49	4.6	2.0	3.9	1.0	14	.69	.08	.00	.00	.00
18	.02	.49	4.3	1.9	3.6	.98	7.9	.65	.07	.00	.00	.00
19	.06	2.5	6.4	1.7	3.0	.75	6.9	.83	.06	.00	.00	.00
20	.05	1.9	4.5	1.6	2.7	.62	80	1.2	.06	.00	.00	.00
21	.03	1.2	3.1	1.6	2.5	.68	15	3.7	.06	.00	.00	.00
22	.03	.95	3.1	2.8	2.5	.60	8.1	1.4	.08	.00	.00	.00
23	.04	.89	3.0	5.3	2.3	.59	5.1	.81	.28	.00	.00	.00
24	.11	.89	2.7	3.1	1.6	.73	3.9	.64	.15	.00	.00	.00
25	.06	2.4	2.7	2.5	1.6	.79	3.3	.53	.08	.00	.00	.00
26	.05	4.6	2.3	2.3	1.7	1.7	2.8	.48	.06	.00	.00	.00
27	.06	2.1	2.2	2.3	1.6	3.4	2.6	.40	.05	.00	.00	.00
28	.09	1.7	2.0	1.8	1.6	2.8	2.5	.39	.04	.00	.00	.00
29	4.8	1.5	1.7	1.5	---	1.3	6.0	.40	.04	.00	.00	.00
30	1.5	1.5	1.6	2.1	---	.93	23	.33	.04	.00	.00	.00
31	.95	---	1.4	2.2	---	.71	---	.31	---	.00	.00	---
TOTAL	8.11	31.64	143.1	71.1	191.6	53.73	291.50	45.93	3.98	.15	.00	.00
MEAN	.26	1.05	4.62	2.29	6.84	1.73	9.72	1.48	.13	.005	.000	.000
MAX	4.8	4.6	35	6.3	95	9.8	80	5.2	.44	.03	.00	.00
MIN	.00	.42	1.2	1.3	1.6	.59	.33	.31	.04	.00	.00	.00
CFSM	.06	.23	1.00	.50	1.48	.38	2.11	.32	.03	.001	.000	.000
IN.	.07	.26	1.15	.57	1.55	.43	2.35	.37	.03	.00	.00	.00
AC-FT	.16	.63	284	141	380	107	578	.91	7.9	.3	.00	.00
(††)	5.27	2.21	2.29	1.44	2.72	2.31	6.78	1.62	2.17	.03	.10	1.30
CAL YR 1976	TOTAL	662.30	MEAN	1.81	MAX	86	MIN	.00	CFSM	.39	IN	5.34
WTR YR 1977	TOTAL	840.84	MEAN	2.30	MAX	95	MIN	.00	CFSM	.50	IN	6.78
									AC-FT	1310	††	35.83
									AC-FT	1670	††	28.24

†† Weighted-mean rainfall, in inches, based on two rain gages.

## COLORADO RIVER BASIN

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## 08159200 COLORADO RIVER AT BASTROP, TX

LOCATION.--Lat 30°06'20", long 97°19'08", Bastrop County, Hydrologic Unit 12090301, on left bank in city park at Bastrop, 400 ft (122 m) upstream from bridge on State Highway 71, 0.3 mi (0.5 km) upstream from Gills Creek, 1.1 mi (1.8 km) downstream from Piney Creek, and at mile 236.8 (381.0 km).

DRAINAGE AREA.--39,400 mi<sup>2</sup> (102,000 km<sup>2</sup>), approximately, of which 12,880 mi<sup>2</sup> (33,360 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 307.38 ft (93.689 m) above mean sea level. Prior to May 10, 1960, nonrecording gage at same site and datum.

REMARKS.--Records good. National Weather Service gage-height telemeter at station. There are many diversions above stations for irrigation and municipal supply. Regulation is the same as that for Colorado River at Austin. During the 1977 water year, 1,658 acre-ft (2.04 hm<sup>3</sup>) was diverted above this station by pumping into Decker Lake by the City of Austin. During the year the Lower Colorado River Authority diverted 3,192 acre-ft (3.94 hm<sup>3</sup>) above this station into Lake Bastrop.

AVERAGE DISCHARGE.--17 years, 2,273 ft<sup>3</sup>/s (64.37 m<sup>3</sup>/s), 1,647,000 acre-ft/yr (2.03 km<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 79,600 ft<sup>3</sup>/s (2,250 m<sup>3</sup>/s) Oct. 29, 1960, gage height, 34.45 ft (10.500 m); minimum daily, 75 ft<sup>3</sup>/s (2.12 m<sup>3</sup>/s) Apr. 1, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1845, 60.3 ft (18.38 m) July 7 or 8, 1869. Flood of June 16, 1935, reached a stage of 57.0 ft (17.37 m), and flood of Dec. 4, 1913, reached a stage of 53.3 ft (16.25 m), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 44,600 ft<sup>3</sup>/s (1,260 m<sup>3</sup>/s) Apr. 20, gage height, 25.02 ft (7.626 m); minimum daily, 298 ft<sup>3</sup>/s (8.44 m<sup>3</sup>/s) Nov. 10, 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2360	693	3710	1130	2550	1950	3550	14800	6150	2610	1730	2260
2	2350	482	2800	1010	2930	2060	3590	24300	6180	2710	1740	2280
3	2280	443	762	1790	2350	1810	3640	24500	6150	2860	1720	2250
4	2350	395	532	1970	1560	2620	3580	11900	6120	2430	1720	2180
5	2490	365	538	1510	964	2280	3630	7410	6110	2640	1920	2340
6	1510	346	2660	1060	715	2050	3560	6930	5740	2520	2060	2280
7	662	330	2150	2060	689	1910	3670	6810	5930	2180	2030	2320
8	454	319	1980	1180	707	1990	3100	6730	6070	2190	2030	2250
9	408	316	1590	716	1100	1940	2310	6530	6060	2130	2080	2400
10	369	298	1850	1560	1250	1370	2140	6490	6030	1890	2080	2370
11	350	298	3900	3140	6050	1180	2190	6570	4630	1840	2030	2440
12	332	307	5510	2550	15000	1110	2160	6510	3740	1950	2060	2590
13	319	318	2240	1840	4140	1130	2150	6290	3690	1940	1700	2710
14	311	713	1920	1640	3250	1100	2340	6080	3640	1800	2040	2190
15	330	532	2570	1220	3230	1160	2340	6230	3670	1780	2340	1130
16	471	517	2530	982	3110	1250	17500	6220	3800	1800	2320	1280
17	758	436	1720	1080	2940	1210	39600	6210	3700	1790	2330	1400
18	406	369	2170	2660	2680	1370	34200	6200	3670	1810	2270	1350
19	348	619	1030	2720	1470	1400	32200	6200	3680	1820	2340	1270
20	412	1530	1510	3500	1130	1430	39500	6240	3480	1650	2230	1780
21	506	762	1660	1780	1050	1120	27600	6350	3180	2220	2270	1280
22	355	474	1890	803	1030	1250	13200	6500	3160	1450	2270	1420
23	317	827	1170	967	1490	1490	19800	6250	2900	1220	2260	1240
24	882	1820	849	1270	1720	1130	16700	6200	2900	1130	2240	1080
25	1690	2170	842	917	1650	1160	12000	10400	2840	1100	2260	1120
26	654	5080	615	978	1270	1260	7680	14100	2720	1100	2260	976
27	407	2020	522	1310	1420	1390	7430	8980	2640	1240	2250	1640
28	348	2590	695	1510	1800	2740	7150	6250	2760	1420	2260	1250
29	1470	3470	715	1440	---	3670	6870	6230	2610	1380	2270	988
30	6160	3260	866	1380	---	3620	6980	6300	2680	1630	2270	1240
31	1310	---	561	1250	---	3060	---	6130	---	1860	2260	---
TOTAL	33369	32099	54057	48923	69245	54210	332360	262840	126630	58090	65640	53304
MEAN	1076	1070	1744	1578	2473	1749	11080	8479	4221	1874	2117	1777
MAX	6160	5080	5510	3500	15000	3670	39600	24500	6180	2860	2340	2710
MIN	311	298	522	716	689	1100	2140	6080	2610	1100	1700	976
AC-FT	66190	63670	107200	97040	137300	107500	659200	521300	251200	115200	130200	105700
CAL YR 1976	TOTAL	726399	MEAN	1985	MAX	22100	MIN	180	AC-FT	1441000		
WTR YR 1977	TOTAL	1190767	MEAN	3262	MAX	39600	MIN	298	AC-FT	2362000		

## COLORADO RIVER BASIN

08159200 COLORADO RIVER AT BASTROP, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1967 to September 1973, October 1975 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA, MG) (MG/L)
OCT 13...	1220	315	652	7.9	22.0	8.8	104	.7	250
DEC 16...	1320	3400	568	7.2	14.0	9.3	93	1.2	220
FEB 16...	0900	3580	562	7.6	12.0	9.3	89	1.1	220
APR 14...	1307	3230	571	8.0	20.5	8.2	93	.5	210
JUN 14...	1155	3780	509	7.9	26.0	7.0	88	.6	190
AUG 16...	1027	2640	535	7.6	28.5	6.8	88	.4	210
DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)
OCT 13...	37	67	21	35	1.0	3.8	264	0	44
DEC 16...	46	56	19	30	.9	3.5	210	0	44
FEB 16...	43	56	20	28	.8	3.3	218	0	40
APR 14...	40	48	22	31	.9	3.8	208	0	37
JUN 14...	39	45	18	28	.9	3.4	180	0	35
AUG 16...	52	52	19	31	.9	3.5	190	0	37
DATE	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)
OCT 13...	51	.5	8.8	361	.74	.02	.00	.43	.44
DEC 16...	49	.3	9.1	314	.70	.03	.09	.46	.21
FEB 16...	45	.3	8.6	309	.57	.03	.12	.42	.18
APR 14...	55	.2	8.1	308	.55	.02	.05	.41	.15
JUN 14...	50	.2	7.8	276	.43	.02	.04	.16	.15
AUG 16...	53	.2	9.8	299	.35	.01	.01	.81	.15

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LOCATION.--Lat 29°47'56", long 96°31'55", Colorado County, Hydrologic Unit 12090301, on left bank 68 ft (21 m) downstream from bridge on Farm Road 109, 1.8 mi (2.9 km) upstream from Cummins Creek, and 7.0 mi (11.3 km) north of Columbus.

GAGE.--Water-stage recorder. Datum of gage is 200.82 ft (61.210 m) above mean sea level. Prior to Oct. 1, 1975, at datum 10.00 ft (3.048 m) higher.

AVERAGE DISCHARGE.--15 years, 6.00 ft<sup>3</sup>/s (0.170 m<sup>3</sup>/s), 4.71 in/yr (120 mm/yr), 4,350 acre-ft/yr (5.36 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,200 ft<sup>3</sup>/s (119 m<sup>3</sup>/s) Oct. 23, 1970, gage height, 24.60 ft (7.498 m), from rating curve extended above 2,170 ft<sup>3</sup>/s (61.5 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow of Jan. 22, 1965; no flow for many days.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1860, about 33.4 ft (10.18 m) in late June or early July 1940, from information by Texas Highway Department and local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft<sup>3</sup>/s (17.0 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)		Gage height (ft) (m)		Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)		Gage height (ft) (m)	
Oct. 29	1045	875	24.8	16.09	4.904	Apr. 16	1030	*1,910	54.1	19.00	5.791
Feb. 3	0200	1,180	33.4	17.00	5.182	Apr. 20	1200	1,700	48.1	18.42	5.614
Feb. 10	1630	634	18.0	15.26	4.651						

Minimum discharge, 0.16 ft<sup>3</sup>/s (0.005 m<sup>3</sup>/s) Aug. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.68	2.6	1.1	4.3	8.9	2.4	1.9	20	1.1	.45	.22	.33
2	.63	2.1	.97	7.0	7.7	2.4	2.4	6.2	1.0	.42	.22	.33
3	.63	1.7	.87	8.7	228	3.8	2.6	5.0	.87	.42	.20	.27
4	.59	1.6	.82	6.6	17	3.8	2.1	3.7	.87	.42	.22	.27
5	1.6	1.4	54	5.6	11	2.7	1.6	3.0	.82	.39	.20	.27
6	.72	1.3	129	7.3	8.4	2.6	1.4	2.8	1.0	.55	.25	.27
7	.59	1.2	8.9	6.4	7.3	2.3	1.3	2.4	.82	.82	.22	1.7
8	.82	1.1	3.2	5.2	6.8	2.4	1.3	2.4	.72	.45	.25	1.3
9	.68	1.1	2.3	13	6.4	2.1	1.4	11	.72	.42	.20	.68
10	.63	1.1	2.1	5.6	174	2.1	1.3	6.8	.72	.39	.22	.48
11	.55	1.1	136	4.5	84	2.3	1.3	3.1	.72	.39	.22	.36
12	.55	.97	24	4.8	19	2.3	1.3	2.4	.77	.39	.22	.36
13	.55	3.0	11	56	8.9	2.0	1.3	2.1	.72	.33	.25	1.5
14	.55	1.6	103	23	6.6	1.9	1.3	1.9	1.1	.36	.36	1.8
15	18	1.2	16	7.5	5.2	1.9	59	1.9	2.7	.39	1.3	.39
16	9.7	1.1	8.4	4.8	4.5	1.9	366	1.8	1.3	.36	.82	.33
17	1.6	1.1	6.4	4.0	4.3	1.9	24	1.7	.82	.36	.36	.33
18	1.2	1.1	5.4	3.7	4.0	1.8	12	1.6	.68	.36	.33	.33
19	4.5	31	75	3.4	3.8	1.7	7.5	1.6	.59	.36	.33	1.2
20	2.3	7.7	76	3.2	3.4	1.6	477	1.6	.59	.63	.33	.68
21	1.3	1.8	13	3.1	3.4	1.6	25	5.0	.55	.36	.27	.36
22	1.1	1.2	9.7	3.1	3.4	1.6	13	3.0	.55	.33	.20	.33
23	1.1	1.0	8.9	4.3	3.2	1.5	9.2	2.1	1.1	.33	.20	.33
24	65	.97	8.0	4.0	2.7	2.0	7.3	1.7	1.4	.33	.20	.33
25	8.4	1.0	12	3.1	2.6	2.8	6.6	1.6	.63	.27	.30	.33
26	2.3	1.1	9.4	3.0	2.6	2.6	5.8	1.4	.55	.27	.36	.30
27	1.6	.92	7.0	3.0	2.4	3.2	5.4	1.3	.52	.25	.27	.27
28	1.3	1.8	6.2	2.8	2.4	4.5	5.0	1.2	.52	.33	2.4	.22
29	177	1.6	5.2	2.3	---	2.3	4.8	1.3	.45	.39	.72	.22
30	12	1.3	5.0	24	---	1.9	30	1.3	.45	.30	.42	.22
31	4.7	---	4.5	24	---	1.7	---	1.1	---	.25	.39	---
TOTAL	322.87	77.76	753.36	261.3	641.9	71.6	1080.1	104.0	25.35	12.07	12.45	16.09
MEAN	10.4	2.59	24.3	8.43	22.9	2.31	36.0	3.35	.85	.39	.40	.54
MAX	177	31	136	56	228	4.5	477	20	2.7	.82	2.4	1.8
MIN	.55	.92	.82	2.3	2.4	1.5	1.3	1.1	.45	.25	.20	.22
CFSM	.60	.15	1.41	.49	1.32	.13	2.08	.19	.05	.02	.02	.03
IN.	.69	.17	1.62	.56	1.38	.15	2.32	.22	.05	.03	.03	.03
AC-FT	640	154	1490	518	1270	142	2140	206	50	24	25	32
CAL YR 1976	TOTAL	2049.92		MEAN 5.60	MAX 277	MIN .18	CFSM .32	IN 4.41	AC-FT 4070			
WTR YR 1977	TOTAL	3378.85		MEAN 9.26	MAX 477	MIN .20	CFSM .54	IN 7.27	AC-FT 6700			

## COLORADO RIVER BASIN

08161000 COLORADO RIVER AT COLUMBUS, TX

LOCATION.--Lat 29°42'22". Long 96°32'12", Colorado County, Hydrologic Unit 12090302, near right bank at downstream side of pier of bridge on U.S. Highway 90 at eastern edge of Columbus, 340 ft (104 m) downstream from Texas and New Orleans Railroad Co. bridge, 2.6 mi (4.2 km) downstream from Cummins Creek, and at mile 135.1 (217.4 km).

DRAINAGE AREA.--41,070 mi<sup>2</sup> (106,370 km<sup>2</sup>), approximately, of which 12,880 mi<sup>2</sup> (33,360 km<sup>2</sup>) probably is noncontributing; 41,170 mi<sup>2</sup> (106,630 km<sup>2</sup>), approximately at site "near Eagle Lake".

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1903 to December 1911 (gage heights only), May 1916 to current year. Discharge records for 1902-11, published in WSP 84, 99, 132, 174, 210, 288, and 308, have been found to be unreliable and should not be used. Records collected at site 23 mi (37 km) downstream October 1930 to May 1939, published as "near Eagle Lake". Gage-height records collected in this vicinity since 1903 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1342: Drainage area. WSP 1562: 1920-21(M), 1922. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 155.52 ft (47.402 m) above mean sea level. Prior to May 1, 1919, various nonrecording gages at sites in the immediate vicinity at datum 3.00 ft (0.914 m) lower. May 1, 1919, to Nov. 23, 1930, water-stage recorder at site about 300 ft (91 m) downstream at datum 3.00 ft (0.914 m) lower. Sept. 17, 1930, to June 12, 1939 (Oct. 1, 1930, to May 31, 1939, used herein), water-stage recorder at site 23 mi (37 km) downstream at different datum. May 17 to Nov. 14, 1939, nonrecording gage at present site and datum.

REMARKS.--Water-discharge records good except those above 25,000 ft<sup>3</sup>/s (708 m<sup>3</sup>/s), which are fair. At times, low-flow releases from Lake Travis (station 08154500) are made for generation of electric power and (or) to fulfill downstream water contracts. Flow is also affected at times by discharge from flood-detention pools of 20 floodwater-retarding structures with a combined detention capacity of 25,570 acre-ft (31.5 hm<sup>3</sup>). These structures control runoff from 73.1 mi<sup>2</sup> (189.3 km<sup>2</sup>) in the Cummins Creek watershed. The Lower Colorado River Authority reported that 39,840 acre-ft (49.1 hm<sup>3</sup>) was diverted from the river to Cedar Creek Reservoir (station 08063010) during the current year. This reservoir is located 10 mi (16 km) north of the river and 3.5 mi (5.6 km) west of Fayetteville. Many other diversions above station for irrigation and municipal supply.

AVERAGE DISCHARGE.--20 years (water years 1917-36) unregulated, 3,809 ft<sup>3</sup>/s (107.9 m<sup>3</sup>/s), 2,760,000 acre-ft/yr (3.40 km<sup>3</sup>/yr); 41 years (water years 1937-77) regulated, 3,007 ft<sup>3</sup>/s (85.16 m<sup>3</sup>/s), 2,179,000 acre-ft/yr (2.69 km<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 190,000 ft<sup>3</sup>/s (5,380 m<sup>3</sup>/s) June 18, 1935, gage height, 38.5 ft (11.73 m), present site and datum, computed on basis of records for station near Eagle Lake; minimum, 93 ft<sup>3</sup>/s (2.63 m<sup>3</sup>/s) Sept. 1, 1918.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1852, 41.6 ft (12.68 m), present datum, in July 1869 and Dec. 6, 1913, from information by local resident. River divided each time and left Columbus on an island.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 64,300 ft<sup>3</sup>/s (1,820 m<sup>3</sup>/s) Apr. 22, gage height, 28.50 ft (8.687 m); minimum daily, 469 ft<sup>3</sup>/s (13.3 m<sup>3</sup>/s) Oct. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2590	5740	3690	1240	2420	1820	3430	8760	6360	2630	1490	2070
2	2450	2620	3630	1100	2120	2240	3330	10600	6190	2570	1660	2060
3	2420	1890	3710	1520	7230	2320	3550	17900	6220	2610	1560	2070
4	2330	1490	2310	1540	4730	2500	3690	21100	6180	2780	1530	2060
5	2470	1210	1590	2200	3220	2360	3550	17800	6140	2460	1520	2000
6	2810	1040	13900	2320	2110	2870	3550	9040	6100	2500	1530	2030
7	2370	908	23200	1740	1570	2390	3620	7930	5950	2580	1750	2100
8	1530	806	11500	1570	1220	2270	3500	7460	5730	2340	1820	2170
9	945	739	5070	2260	1080	2180	3500	7430	5960	2140	1860	2270
10	704	677	3910	1600	2060	2180	2580	7130	5960	2110	1880	2170
11	612	639	7770	1180	18300	2110	2160	7130	5940	2030	1890	2200
12	555	588	17900	2280	20400	1640	2100	6960	5570	1830	1930	2130
13	505	576	12600	3410	19000	1440	2090	7060	4190	1780	1870	2340
14	469	636	7810	2750	11000	1350	2140	6860	3880	1910	1900	2510
15	475	869	8270	2520	5880	1370	2140	6680	3830	1840	1870	2460
16	2000	850	5830	2310	4810	1330	13400	6680	3920	1750	1660	1810
17	2010	963	4350	1720	4480	1370	26200	6640	3930	1740	2030	1130
18	1510	745	3620	1440	4090	1420	27400	6580	3830	1760	2140	1150
19	1080	1010	3040	1790	3790	1360	32200	6550	3680	1750	2100	1190
20	1130	1890	5260	2530	3130	1480	41900	6530	3730	1770	2120	1170
21	1570	3300	2690	3310	2220	1500	62000	6600	3510	1770	2080	1100
22	1040	2530	2750	3100	1940	1500	61400	6700	3360	1730	2040	1420
23	819	1460	2590	1840	1770	1230	33800	6790	3150	2000	2050	1150
24	2360	1050	2450	1280	1670	1380	18900	6630	3100	1490	2060	1170
25	9040	1140	1950	1470	2020	1600	19000	6450	2810	1310	2080	1100
26	6750	2190	1770	1680	2130	1310	15200	7410	2970	1230	2050	1020
27	3010	8540	1580	1300	2000	1320	10600	12100	2760	1200	2070	1020
28	1550	7590	1340	1250	1670	1470	9180	10600	2660	1180	2110	980
29	5230	3130	1160	1530	---	1720	8730	7040	2710	1220	2100	1260
30	13400	3700	1160	1720	---	3400	8420	6470	2640	1300	2100	1080
31	12300	---	1170	2700	---	3680	---	6400	---	1270	2090	---
TOTAL	88034	60516	169570	60200	138060	58110	433260	266010	132960	58580	58940	50390
MEAN	2840	2017	5470	1942	4931	1875	14440	8581	4432	1890	1901	1680
MAX	13400	8540	23200	3410	20400	3680	62000	21100	6360	2780	2140	2510
MIN	469	576	1160	1100	1080	1230	2090	6400	2640	1180	1490	980
AC-FT	174600	120000	336300	119400	273800	115300	859400	527600	263700	116200	116900	99950
CAL YR 1976	TOTAL	1053672	MEAN	2879	MAX	23200	MIN	246	AC-FT	2090000		
WTR YR 1977	TOTAL	1574630	MEAN	4314	MAX	62000	MIN	469	AC-FT	3123000		



COLORADO RIVER BASIN

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08161000 COLORADO RIVER AT COLUMBUS, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD---Chemical analyses: October 1967 to September 1971. Chemical and biochemical analyses: February 1968 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIO-CHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA, MG)
NOV 09...	0915	720	532	7.8	16.0	8.7	91	.9	220
JAN 19...	0830	1500	757	7.5	5.0	11.8	95	.2	280
MAR 07...	1335	2300	642	7.8	16.5	10.8	114	.8	240
MAY 09...	1315	7400	561	7.3	24.0	8.6	105	.8	210
JUL 20...	1400	2000	571	7.8	31.0	7.5	101	1.0	210
SEP 13...	0915	2400	584	7.7	28.5	7.2	94	.5	200
DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)
NOV 09...	37	68	12	23	.7	3.9	222	0	41
JAN 19...	88	81	18	46	1.2	4.0	230	0	83
MAR 07...	46	60	21	35	1.0	3.4	232	0	53
MAY 09...	40	52	20	28	.8	3.2	210	0	37
JUL 20...	30	53	19	32	1.0	3.6	220	0	38
SEP 13...	28	49	19	32	1.0	3.6	210	0	38
DATE	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)
NOV 09...	31	.5	14	303	.75	.01	.02	.49	.12
JAN 19...	67	.3	11	424	.51	.01	.02	.59	.09
MAR 07...	54	.3	7.2	348	.70	.01	.01	.36	.11
MAY 09...	47	.2	9.1	300	.47	.01	.00	.12	.13
JUL 20...	47	.3	8.1	309	.43	.01	.00	.41	.11
SEP 13...	51	.3	8.8	305	.53	.01	.00	.56	.17



## COLORADO RIVER BASIN

08162000 COLORADO RIVER AT WHARTON, TX  
(National stream-quality accounting and radiochemical networks)

LOCATION.--Lat 29°18'32", long 96°06'13", Wharton County, Hydrologic Unit 12090302, near left bank at downstream side of downstream bridge on U.S. Highway 59 in Wharton, 1,100 ft (335 m) downstream from Texas and New Orleans Railroad Co. bridge, 12 mi (19 km) upstream from Jones Creek, and at mile 66.6 (107.2 km).

DRAINAGE AREA.--41,380 mi<sup>2</sup> (107,170 km<sup>2</sup>), approximately, of which 12,880 mi<sup>2</sup> (33,360 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1916 to August 1918 (intermittent periods), March 1919 to September 1925, July and August 1938 (flood discharge measurements only), October 1938 to current year. June to November 1901 and May to September 1902, daily records published in U.S. Department of Agriculture, Office of Experiment Stations, Bulletin Nos. 119 and 133. Gage-height records collected in this vicinity since 1935 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 878: 1938(M). WSP 1342: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 62.42 ft (19.026 m) above mean sea level. Prior to Oct. 1, 1938, various types of recording and nonrecording gages 800 ft (244 m) upstream at different datum. Oct. 1, 1938, to June 1, 1966, nonrecording gage 100 ft (30 m) upstream at datum 3.00 ft (0.914 m) higher. June 1, 1966, to Sept. 30, 1975, water-stage recorder at present site at datum 3.00 ft (0.914 m) higher.

REMARKS.--Water-discharge records fair. Many diversions above station for irrigation, municipal supply, power generation plant cooling, and oilfield operations. For statement regarding upstream regulation and regulation by Soil Conservation Service floodwater-retarding structures, see station 08161000.

AVERAGE DISCHARGE.--5 years (water years 1920-25) unregulated, 3,680 ft<sup>3</sup>/s (104.2 m<sup>3</sup>/s), 2,666,000 acre-ft/yr (3.29 km<sup>3</sup>/yr); 39 years (water years 1939-77) regulated, 2,779 ft<sup>3</sup>/s (78.70 m<sup>3</sup>/s), 2,013,000 acre-ft/yr (2.48 km<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 100,000 ft<sup>3</sup>/s (2,830 m<sup>3</sup>/s) July 3, 1940, gage height, 38.99 ft (11.884 m); no flow Aug. 6, 1925 (result of pumping).

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1869, 41.9 ft (12.77 m) Dec. 8, 1913, present datum, from information by local residents; below Wharton floodwater combined with floodwater of Brazos River. Flood of about July 12, 1869, reached about same height. Flood of June 20, 1935, reached a stage of 41.2 ft (12.56 m), present datum, furnished by National Weather Service, discharge, 159,000 ft<sup>3</sup>/s (4,500 m<sup>3</sup>/s), from rating curve defined by current-meter measurements below 145,000 ft<sup>3</sup>/s (4,110 m<sup>3</sup>/s). Flood of July 30, 1938, reached a stage of 40.4 ft (12.31 m), present datum, observed by Geological Survey engineers, discharge, 145,000 ft<sup>3</sup>/s (4,110 m<sup>3</sup>/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 53,000 ft<sup>3</sup>/s (1,500 m<sup>3</sup>/s) Apr. 23, gage height, 32.35 ft (9.860 m); minimum daily, 693 ft<sup>3</sup>/s (19.6 m<sup>3</sup>/s) Sept. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB.	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2520	11300	3520	1370	2570	1820	3140	8200	5500	1820	1090	1740
2	2690	5810	3620	1370	2640	1790	3100	8330	5370	1710	1070	1530
3	2610	3030	3480	1370	2260	2100	2970	10300	5210	1700	1200	1370
4	2520	2230	3560	1420	7430	2260	3180	16700	5210	1690	1070	1370
5	2300	1780	2520	1580	5290	2390	3220	19500	5180	1800	948	1370
6	2360	1460	3640	1980	3630	2260	3160	15500	5190	1790	890	1350
7	2650	1300	18400	2240	2580	2690	3130	8440	5210	1730	893	1300
8	2540	1170	21900	1970	1970	2430	3160	7330	4990	1820	1040	1470
9	1920	1080	10500	1600	1640	2250	3070	6810	4790	1740	1160	1610
10	1420	1020	5360	2140	1640	2170	3070	6660	4960	1530	1020	1880
11	1080	951	4740	1840	5420	2180	2410	6220	5080	1540	970	1830
12	896	874	10800	1440	19400	2120	1980	6070	5060	1530	986	1800
13	833	863	17900	1800	19800	1830	1840	5910	4720	1410	1010	1770
14	786	830	12500	3740	17800	1580	1870	5940	3700	1380	1000	2130
15	754	814	9660	3500	9820	1470	1880	5800	3740	1440	1050	2360
16	763	901	8900	2810	5950	1490	2060	5760	4770	1440	962	2350
17	1520	901	6310	2540	4940	1460	16400	5740	4360	1370	968	1930
18	2190	996	4930	2020	4550	1450	26100	5730	4060	1460	1200	1350
19	1760	990	4340	1670	4150	1500	26900	5550	3720	1580	1270	1210
20	1360	1120	5090	1710	3840	1460	31700	5470	3320	1660	1350	1290
21	1080	1580	7030	2470	3290	1480	39000	5600	2960	1710	1340	1290
22	1520	2850	3750	3100	2530	1500	48500	6120	2690	1680	1370	1150
23	1280	2540	3290	3180	2200	1500	52300	6100	2560	1600	1240	1240
24	1050	1620	3030	2200	2010	1320	44100	6170	2370	1850	1220	1100
25	1620	1240	2880	1580	1850	1270	21900	6000	2250	1390	1250	1050
26	7670	1120	2460	1490	2000	1480	19100	5700	2030	1150	1230	989
27	6490	1860	2240	1830	2120	1330	14900	6800	2180	1030	1230	854
28	3430	7390	1940	1530	2040	1290	10500	10700	2080	977	1250	693
29	2130	6740	1710	1400	---	1270	8990	9140	2020	975	1390	707
30	6160	3220	1490	1510	---	1390	8380	6220	1940	995	1550	815
31	12800	---	1380	1790	---	2570	---	5710	---	1100	1680	---
TOTAL	80702	69580	192870	62190	145360	55100	412010	240220	117220	46597	35897	42898
MEAN	2603	2319	6222	2006	5191	1777	13730	7749	3907	1503	1158	1430
MAX	12800	11300	21900	3740	19800	2690	52300	19500	5500	1850	1680	2360
MIN	754	814	1380	1370	1640	1270	1840	5470	1940	975	890	693
AC-FT	160100	138000	382600	123400	288300	109300	817200	476500	232500	92430	71200	85090
CAL YR 1976	TOTAL	1002271	MEAN	2738	MAX	21900	MIN	342	AC-FT	1988000		
WTR YR 1977	TOTAL	1500644	MEAN	4111	MAX	52300	MIN	693	AC-FT	2977000		

08162000 COLORADO RIVER AT WHARTON, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: April 1944 to current year. Chemical and biochemical analyses: January 1968 to current year. Pesticide analyses: February 1968 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1944 to current year.

WATER TEMPERATURES: October 1945 to September 1948, March 1950 to current year.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 904 micromhos Oct. 29, 1963; minimum daily, 146 micromhos Sept. 27, 1957.

WATER TEMPERATURES: Maximum daily, 35.0°C July 26, 1954; minimum daily, 2.0°C Dec. 23, 1963, Jan. 14, 1964.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 738 micromhos Jan. 21; minimum daily, 218 micromhos Dec. 7.

WATER TEMPERATURES: Maximum daily, 30.5°C July 24, 25; minimum daily, 5.0°C Jan. 19.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)
OCT 06...	1300	2500	517	7.3	23.5	30	40	8.8	106	.5
NOV 09...	1100	1200	453	8.0	17.0	40	20	9.0	96	.8
DEC 08...	0915	24000	188	7.6	12.0	200	250	8.4	81	1.9
JAN 19...	1000	1700	637	8.0	6.0	40	20	11.7	97	1.4
FEB 22...	1330	2400	567	7.8	18.0	40	40	9.2	100	.5
MAR 07...	1100	2800	626	7.7	15.5	20	40	10.3	106	.7
APR 06...	0930	3300	602	8.0	19.0	30	80	8.6	96	.9
MAY 09...	1000	6800	569	7.7	24.0	10	100	8.4	102	.7
JUN 06...	1130	5000	529	8.2	28.0	10	40	8.4	108	1.3
JUL 20...	1130	1700	568	8.4	30.0	10	60	7.0	93	1.4
AUG 03...	1245	1300	593	8.1	32.5	20	60	7.2	99	1.4
SEP 13...	1130	1600	589	8.0	28.0	10	50	7.0	90	1.2

DATE	IMMEDIATE COLIFORM PER 100 ML	FECAL COLIFORM (COL./100 ML)	FECAL STREPTOCOCCI KF AGAR (COL./100 ML)	HARDNESS (CA, MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHORUS (K) (MG/L)
OCT 06...	700	62	68	200	32	48	20	28	.9	3.3
NOV 09...	620	46	52	190	34	59	9.7	21	.7	4.1
DEC 08...	16000	6000	8000	75	13	25	3.0	7.5	.4	4.5
JAN 19...	1000	18	32	240	58	64	19	36	1.0	3.8
FEB 22...	420	16	40	220	39	59	17	27	.8	3.6
MAR 07...	190	28	30	240	39	64	19	33	.9	3.3
APR 06...	520	32	60	210	42	49	21	34	1.0	3.6
MAY 09...	7700	56	140	210	41	53	20	28	.8	3.4
JUN 06...	38000	34	52	190	38	48	18	28	.9	3.3
JUL 20...	320	34	210	230	45	61	19	32	.9	3.5
AUG 03...	130	42	44	220	31	55	20	32	.9	3.6
SEP 13...	4800	64	80	200	35	50	18	34	1.1	3.6

## COLORADO RIVER BASIN

08162000 COLORADO RIVER AT WHARTON, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL FILT- RABLE RESIDUE (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)
OCT 06...	208	0	31	48	.3	7.3	295	288	--	110
NOV 09...	187	0	34	27	.4	13	264	260	280	25
DEC 08...	75	0	12	11	.2	8.4	119	109	--	816
JAN 19...	219	0	55	58	.3	11	372	355	--	69
FEB 22...	218	0	42	43	.3	10	312	309	--	119
MAR 07...	243	0	45	50	.3	7.0	364	342	--	165
APR 06...	204	0	40	55	.2	10	--	313	--	204
MAY 09...	212	0	38	53	.2	9.8	315	310	--	233
JUN 06...	190	0	36	47	.3	8.7	286	283	--	97
JUL 20...	210	8	36	47	.3	8.1	314	319	--	89
AUG 03...	230	0	37	48	.3	7.5	329	317	290	29
SEP 13...	200	0	42	51	.3	8.5	315	306	--	123
DATE	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUS- PENDE SEDIM- ENT (MG/L)	SUS- PENDE SEDIM- ENT CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT 06...	26	.30	.00	.03	.63	.15	9.2	58	391	99
NOV 09...	18	.56	.01	.01	.74	.11	5.4	32	104	91
DEC 08...	160	.11	.01	.04	1.7	.29	10	5530	358000	11
JAN 19...	15	.17	.00	.01	.66	.11	3.0	52	239	69
FEB 22...	43	.62	.01	.00	.44	.12	2.2	333	2160	37
MAR 07...	31	.47	.00	.04	.46	.13	9.5	315	2380	24
APR 06...	48	.32	.01	.01	.83	.21	4.6	98	873	95
MAY 09...	56	.46	.01	.00	.00	.16	3.6	237	4350	100
JUN 06...	26	.24	.01	.00	.50	.12	3.1	107	1440	85
JUL 20...	28	.15	.01	.00	.60	.13	3.2	142	652	64
AUG 03...	12	.09	.01	--	--	.10	2.3	28	98	98
SEP 13...	14	.59	.01	--	--	.20	2.4	74	320	93

08162000 COLORADO RIVER AT WHARTON, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)
NOV 09...	1100	4	3	100	0	0	20	0
JAN 19...	1000	1	1	100	1	1	<10	2
MAR 07...	1100	3	2	200	0	0	10	0
JUL 20...	1130	--	2	300	<10	0	5	0

DATE	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)
NOV 09...	0	0	3	3	1000	10	3	0	30
JAN 19...	0	0	2	2	1300	20	8	3	30
MAR 07...	0	0	3	3	1700	10	4	4	40
JUL 20...	<50	0	20	2	1500	10	<100	0	60

DATE	DIS-SOLVED MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV 09...	10	.1	.1	0	0	0	30	10
JAN 19...	0	.0	.0	0	0	0	10	10
MAR 07...	0	.4	.3	0	0	0	20	20
JUL 20...	60	.1	.0	--	1	0	30	2

DATE	TIME	DIS-SOLVED GROSS ALPHA AS U-NAT. (UG/L)	SUS-PENDED GROSS ALPHA AS U-NAT. (UG/L)	DIS-SOLVED GROSS BETA AS CS-137 (PC/L)	SUS-PENDED GROSS BETA AS CS-137 (PC/L)	DIS-SOLVED GROSS BETA AS SR90 /Y90 (PC/L)	SUS-PENDED GROSS BETA AS SR90 /Y90 (PC/L)	DIS-SOLVED RA-226 (PLAN-CHET COUNT) (PC/L)	DIS-SOLVED RA-226 (RADON METHOD) (PC/L)	DIS-SOLVED NATURAL URANIUM (U) (UG/L)	DIS-SOLVED URANIUM (DIRECT FLUORO-METRIC) (PC/L)
NOV 09...	1100	16	1.2	7.7	1.1	6.8	.9	<.1	--	--	1.2
AUG 03...	1245	5.4	2.0	4.2	1.5	3.4	1.2	--	.29	1.3	--

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MATERIAL (UG/KG)	POLY-CHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL CHLORDANE (UG/L)	CHLORDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MATERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MATERIAL (UG/KG)
NOV 09...	1100	--	--	--	ND	--	ND	--	ND	--	ND	--
JAN 19...	1000	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0
FEB 22...	1330	--	--	--	ND	--	ND	--	ND	--	ND	--
MAR 07...	1100	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0
MAY 09...	1000	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND
JUL 20...	1130	.1	0	.00	.00	.0	.0	0	.00	.0	.00	.0
AUG 03...	1245	--	--	--	ND	--	ND	--	ND	--	ND	--

## COLORADO RIVER BASIN

08162000 COLORADO RIVER AT WHARTON, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	DI- AZINON IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	ETHION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)
NOV 09...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
JAN 19...	.00	.0	.01	--	.00	.0	.00	.0	.00	--	.00	.0
FEB 22...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
MAR 07...	.00	.0	.00	--	.00	.0	.00	.0	.00	--	.00	.0
MAY 09...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
JUL 20...	.00	.0	.00	--	.00	.0	.00	.0	.00	--	.00	.0
AUG 03...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
DATE	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	MALA- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL METH- OXY- CHLOR (UG/L)	METHOX- YCHLOR IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL METHYL PARA- THION (UG/L)	METHYL PARA- THION IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL METHYL TRI- THION (UG/L)	METHYL TRI- THION IN BOT- TOM MA- TERIAL (UG/KG)
NOV 09...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
JAN 19...	.00	.0	.00	.0	.00	--	--	--	.00	--	.00	--
FEB 22...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
MAR 07...	.00	.0	.00	.0	.00	--	--	--	.00	--	.00	--
MAY 09...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
JUL 20...	.00	.0	.00	.0	.00	--	--	--	.00	--	.00	--
AUG 03...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
DATE	TOTAL PARA- THION (UG/L)	PARA- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TRI- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ATRA- ZINE (UG/L)	SIMA- ZINE TOTAL COUL- SON COND. (UG/L)	SIMA- ZINE IN BOTTOM MATERI- AL (UG/ KG DRY SOLIDS)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 09...	ND	--	ND	--	ND	--	ND	ND	--	ND	ND	ND
JAN 19...	.00	--	0	0	.00	--	--	--	--	.00	.00	.00
FEB 22...	ND	--	ND	--	ND	--	ND	ND	--	ND	ND	ND
MAR 07...	.00	--	0	0	.00	--	--	--	--	.00	.00	.00
MAY 09...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
JUL 20...	.00	--	0	0	.00	--	--	--	--	.02	.00	.00
AUG 03...	ND	--	ND	--	ND	--	ND	ND	--	ND	ND	ND

08162000 COLORADO RIVER AT WHARTON, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 6,76 1300	NOV 9,76 1100	DEC 8,76 0915	JAN 19,77 1000	FEB 22,77 1330					
TOTAL CELLS/ML	6400	270	540	190	920					
DIVERSITY: DIVISION	0.8	0.7	0.8	1.0	0.7					
..CLASS	0.8	0.7	0.8	1.0	0.7					
..ORDER	0.8	0.8	1.5	1.1	1.7					
...FAMILY	1.0	0.8	1.5	1.9	2.2					
....GENUS	1.0	0.8	1.5	1.9	2.2					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....CHARACIACEAE										
....SCHROEDERIA	--	-	--	-	--	-	--	-	--	-
....COELASTRACEAE										
....COELASTRUM	--	-	--	-	--	-	--	-	--	-
....MICRACTINIACEAE										
....GOLINKINIA	--	-	--	-	--	-	--	-	--	-
....MICRACTINIUM	--	-	--	-	--	-	--	-	78	8
....NOCTACEAE										
....ANKISTRODESMUS	--	-	--	-	--	-	22	12	22	2
....DICTYOSPHAERIUM	--	-	--	-	--	-	--	-	--	-
....TREUBARIA	--	-	--	-	--	-	--	-	--	-
....SCENEDESMACEAE										
....SCENEDESMUS	--	-	--	-	--	-	--	-	44	5
....TETRASTRUM	--	-	--	-	--	-	--	-	--	-
..TETRASTRALES										
...COCCOMYXACEAE										
....FLAKATOTHRIX	--	-	--	-	--	-	--	-	22	2
....ULOTRICHIALES										
....ULOTRICHACEAE										
....HORMIDIUM	--	-	--	-	--	-	--	-	550#	60
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	--	-	--	-	--	-	11	6	11	1
CHRYSTOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
....COSCINODISCACEAE										
....COSCINODISCUS	--	-	--	-	140#	25	--	-	--	-
....CYCLOTELLA	--	-	9	3	--	-	--	-	11	1
....MELOSIRA	--	-	--	-	--	-	--	-	44	5
..PENNIALES										
...CYMBELLACEAE										
....AMPHORA	57	1	--	-	--	-	--	-	--	-
....CYMBELLA	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE										
....SYNEDRA	--	-	--	-	--	-	11	6	55	6
...GOMPHONEMACEAE										
....GOMPHONEMA	--	-	5	2	--	-	--	-	--	-
...NAVICULACEAE										
....GYROSIGMA	--	-	--	-	--	-	--	-	--	-
....NAVICULA	280	4	5	2	--	-	--	-	11	1
...NITZSCHIA										
....NITZSCHIA	1100#	17	--	-	270#	50	110#	59	55	6
...SURTRELLACEAE										
....SURTRELLA	--	-	--	-	--	-	22	12	11	1
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCOCCALES										
....CHROCOCCOCCACEAE										
....AGMENELLUM	5000#	78	--	-	--	-	--	-	--	-
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-
...HORMOGONALES										
....OSCILLATORIACEAE										
....OSCILLATORIA	--	-	230#	86	--	-	--	-	*	0
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
....CRYPTOCHRYSIDACEAE										
....CHROOMONAS	--	-	--	-	--	-	11	6	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
....EUGLENACEAE	--	-	19	7	--	-	--	-	--	-
....TRACHELOMONAS										
PYRRHOPHYTA (FIRE ALGAE)										
..DESMOKONTAE										
...DESMOMONADALES										
....PROROCENTRACEAE										
....PROROCENTRUM	--	-	--	-	140#	25	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%



08162000 COLORADO RIVER AT WHARTON, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	MAY 9,77 1000	JUN 6,77 1130	JUL 20,77 1130	AUG 3,77 1245	SEP 13,77 1130					
TOTAL CELLS/ML	2100	1300	22000	130	8900					
DIVERSITY: DIVISION	1.2	0.7	0.9	0.8	0.6					
..CLASS	1.2	0.7	0.9	0.8	0.6					
..ORDER	1.8	1.2	1.0	0.8	0.6					
...FAMILY	2.3	2.5	1.1	0.8	0.8					
....GENUS	2.6	2.7	1.5	0.8	0.8					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....CHARACIACEAE										
....SCHROEDERIA	--	-	51	4	--	-	--	-	--	-
....COELASTRACEAE										
....COELASTRUM	150	7	470#	36	--	-	--	-	--	-
....MICRACTINIACEAE										
....GOLFNKINIA	12	1	--	-	--	-	--	-	--	-
....MICPACTINIUM	--	-	--	-	--	-	--	-	--	-
....OOCYSTACEAE										
....ANKISTRODESMUS	49	2	--	-	--	-	--	-	--	-
....DICTYOSPHAERIUM	--	-	51	4	140	1	--	-	--	-
....TREUBARIA	12	1	76	6	--	-	--	-	--	-
....SCENEDESMACEAE										
....SCENEDESMUS	640#	31	300#	24	--	-	33#	25	--	-
....TETRASTRUM	150	7	--	-	--	-	--	-	--	-
..TETRASPORALES										
...COCCOMYXACEAE										
....FLAKATOTHRIX	--	-	--	-	--	-	--	-	--	-
..ULOTRICHALES										
...ULOTRICHACEAE										
....HORMIDIUM	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	24	1	76	6	230	1	--	-	--	-
CHRYSTOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCACEAE										
....COSCINODISCUS	--	-	--	-	--	-	--	-	--	-
....CYCLOTELLA	--	-	130	10	*	0	--	-	--	-
....MELOSIRA	73	4	76	6	--	-	--	-	--	-
..PENNIALES										
...CYMBELLACEAE										
....AMPHORA	--	-	--	-	--	-	--	-	--	-
....CYMBELLA	12	1	--	-	--	-	--	-	--	-
...FRAGILARIACEAE										
....SYNEDRA	--	-	38	3	270	1	98#	75	330	4
...GOMPHONEMATACEAE										
....GOMPHONEMA	--	-	--	-	--	-	--	-	--	-
...NAVICULACEAE										
....GYROSIGMA	--	-	--	-	--	-	--	-	*	0
....NAVICULA	--	-	25	2	4400#	20	--	-	1000	12
...NITZSCHACEAE										
....NITZSCHIA	24	1	--	-	--	-	--	-	*	0
...SURIRELLACEAE										
....SURIRELLA	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCOCCALES										
....CHROCOCCOCCACEAE										
....AGMENELLUM	390#	19	--	-	14000#	66	--	-	7500#	84
....ANACYSTIS	--	-	--	-	2000	9	--	-	--	-
...HORMOGONALES										
....OSCILLATORIA										
....OSCILLATORIA	540#	26	--	-	180	1	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
....CRYPTOCHRYSIDACEAE										
....CHROOMONAS	--	-	--	-	--	-	--	-	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
....EUGLENACEAE										
....TRACHELONAS	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DESMOKONTAE										
...DESMOMONADALES										
....PROROCENTRACEAE										
....PROROCENTRUM	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## COLORADO RIVER BASIN

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08162000 COLORADO RIVER AT WHARTON, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	80702	388	210	45700	27	5910	26	5590	160
NOV. 1976.....	69580	396	220	40600	28	5220	26	4920	160
DEC. 1976.....	192870	344	190	96600	22	11200	22	11500	140
JAN. 1977.....	62190	630	340	57300	56	9340	46	7640	240
FEB. 1977.....	145360	405	220	86400	29	11300	27	10600	160
MAR. 1977.....	55100	641	350	51600	57	8460	46	6890	250
APR. 1977.....	412010	417	230	251000	30	33400	28	31400	170
MAY 1977.....	240220	545	290	191000	45	29400	39	25000	210
JUNE 1977.....	117220	531	290	91300	44	13800	37	11800	210
JULY 1977.....	46597	570	310	38800	48	6090	41	5100	220
AUG. 1977.....	35897	581	310	30500	50	4820	41	4010	230
SEPT 1977.....	42898	587	320	36800	50	5840	42	4860	230
TOTAL .....	1500644	**	**	1020000	**	145000	**	129000	**
WTD.AVG. ....	4111.35	464	250	**	36	**	32	**	180

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	512	234	336	630	678	646	614	561	538	554	593	571
2	534	324	521	643	607	644	666	549	531	563	591	585
3	542	311	518	652	591	636	602	556	535	552	586	588
4	544	336	528	668	379	643	599	560	536	560	580	588
5	528	343	543	670	405	638	588	554	533	555	583	588
6	536	373	464	675	475	645	599	548	528	552	585	585
7	538	402	218	668	490	628	597	554	529	552	582	592
8	542	429	243	646	536	618	599	571	528	543	579	585
9	534	457	287	614	572	623	597	563	530	555	580	588
10	542	483	337	628	548	660	598	567	532	552	578	585
11	561	509	360	672	400	626	595	563	526	557	579	557
12	581	544	372	633	291	629	610	560	522	570	577	548
13	602	548	245	643	247	625	623	558	519	566	575	578
14	608	579	307	609	310	633	625	556	528	568	574	575
15	617	593	341	508	358	645	630	546	509	575	573	578
16	606	606	300	520	362	651	600	551	478	580	571	576
17	599	627	320	583	428	653	400	546	500	587	593	567
18	516	633	339	599	485	648	270	543	532	585	580	593
19	355	590	412	635	527	641	436	541	548	578	583	606
20	360	538	423	683	555	648	440	538	549	576	586	593
21	360	540	357	738	562	656	451	535	545	582	575	610
22	475	547	350	675	567	655	296	528	542	580	577	612
23	426	421	441	597	571	649	300	529	538	582	581	612
24	361	477	518	590	589	659	350	526	545	580	582	610
25	336	416	559	601	613	648	478	522	551	578	583	608
26	294	457	569	612	633	645	510	526	557	580	585	612
27	258	528	546	635	660	653	530	529	559	583	585	613
28	238	479	550	652	671	641	534	513	560	594	581	627
29	285	311	575	653	---	651	541	510	560	589	583	617
30	291	303	591	693	---	653	553	516	562	603	571	610
31	222	---	608	713	---	630	---	534	---	609	581	---
MEAN	461	465	422	637	504	643	528	544	535	572	581	592

COLORADO RIVER BASIN  
08162000 COLORADO RIVER AT WHARTON, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23.0	12.0	10.0	8.0	8.0	15.0	18.0	21.0	26.0	29.0	29.0	29.0
2	24.0	14.0	10.0	7.0	9.0	17.0	20.0	28.0	26.0	29.0	30.0	28.0
3	25.0	14.0	10.0	6.0	10.0	15.0	21.0	22.0	27.0	29.0	30.0	28.0
4	25.0	15.0	10.0	8.0	11.0	16.0	16.0	21.0	27.0	29.0	30.0	29.0
5	25.0	14.0	13.0	9.0	11.0	15.0	19.0	22.0	26.0	29.0	30.0	29.0
6	20.0	16.0	14.0	9.0	10.0	---	18.0	21.0	27.0	30.0	28.0	29.0
7	21.0	16.0	12.0	8.0	11.0	---	19.0	22.0	27.0	29.0	29.0	28.0
8	19.0	16.0	11.0	10.0	---	15.0	21.0	23.0	27.0	29.0	29.0	28.0
9	17.0	16.0	13.0	9.0	13.0	15.0	20.0	23.0	27.0	29.0	29.0	28.0
10	19.0	18.0	11.0	8.0	14.0	16.0	20.0	23.0	28.0	29.0	29.0	28.0
11	19.0	18.0	---	6.0	14.0	18.0	21.0	23.0	27.0	29.0	30.0	30.0
12	20.0	14.0	11.0	7.0	14.0	16.0	---	21.0	27.0	29.0	29.0	28.0
13	21.0	11.0	12.0	8.0	14.0	17.0	21.0	23.0	27.0	29.0	---	29.0
14	27.0	10.0	11.0	8.0	14.0	17.0	21.0	23.0	28.0	29.0	29.0	---
15	22.0	9.0	11.0	9.0	13.0	16.0	21.0	23.0	26.0	29.0	28.0	27.0
16	20.0	9.0	11.0	8.0	13.0	20.0	---	23.0	27.0	29.0	28.0	28.0
17	19.0	10.0	---	7.0	13.0	21.0	20.0	23.0	---	29.0	29.0	28.0
18	17.0	11.0	13.0	7.0	14.0	21.0	18.0	22.0	27.0	29.0	30.0	29.0
19	18.0	12.0	14.0	5.0	15.5	22.0	19.0	23.0	28.0	29.0	29.0	28.0
20	14.0	13.0	12.5	6.0	16.0	19.0	---	24.0	28.0	29.0	28.0	26.0
21	14.0	---	11.0	7.5	15.0	21.0	18.0	24.0	28.0	29.0	30.0	27.0
22	15.0	13.0	11.0	9.0	16.0	18.0	19.0	23.0	28.0	30.0	29.0	27.0
23	17.0	13.0	10.0	10.0	17.5	17.0	19.0	24.0	28.0	30.0	30.0	28.0
24	19.5	13.0	10.5	10.0	16.0	18.0	---	23.0	28.0	30.5	29.5	---
25	18.0	14.0	11.5	9.5	17.5	18.0	19.0	24.0	28.0	30.5	29.0	28.0
26	18.0	15.0	11.5	11.0	18.0	16.0	18.0	25.0	28.0	30.0	29.0	28.0
27	16.0	14.0	11.0	13.0	15.0	20.0	18.0	25.0	28.0	30.0	29.0	28.0
28	15.0	---	11.0	15.0	15.0	17.0	19.0	25.0	28.0	29.0	29.0	28.0
29	14.0	10.0	10.0	8.0	---	20.0	20.0	24.0	28.0	29.0	28.0	28.0
30	13.0	9.0	12.0	10.0	---	21.0	22.0	25.0	29.0	29.0	28.0	---
31	14.0	---	9.0	8.0	---	20.0	---	25.0	---	30.0	28.0	---
MEAN	19.0	13.0	11.5	8.5	13.5	18.0	19.5	23.5	27.5	29.5	29.0	28.0

## 08162500 COLORADO RIVER NEAR BAY CITY, TX

LOCATION.--Lat 28°58'26", long 96°00'44", Matagorda County, Hydrologic Unit 12090302, on right bank 6,300 ft (1,920 m) downstream from bridge on State Highway 35, 7,100 ft (2,160 m) downstream from Texas and New Orleans Railroad Co. bridge, 2.8 mi (4.5 km) west of Bay City, and at mile 32.5 (52.3 km).

DRAINAGE AREA.--41,650 mi<sup>2</sup> (107,870 km<sup>2</sup>), approximately, of which 12,880 mi<sup>2</sup> (33,360 km<sup>2</sup>) probably is noncontributing.

PERIOD OF RECORD.--July 1940 (in WSP 1046), April 1948 to current year. Records of elevation collected in this vicinity since 1946 are contained in reports of the National Weather Service.

Water-quality records: Chemical and biochemical analyses: October 1974 to September 1975.

REVISED RECORDS.--WSP 1342: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. July 2-6, 1940, nonrecording gage at highway bridge, 6,300 ft (1,920 m) upstream at datum 30.60 ft (9.327 m) lower.

REMARKS.--Water-discharge records fair. Diversions above station for irrigation and municipal supply. For statement regarding upstream regulation and regulation by Soil Conservation Service floodwater-retarding structures, see Colorado River at Columbus (station 08161000).

AVERAGE DISCHARGE.--29 years (water years 1949-77), 2,477 ft<sup>3</sup>/s (70.15 m<sup>3</sup>/s), 1,795,000 acre-ft/yr (2.21 km<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 84,100 ft<sup>3</sup>/s (2,380 m<sup>3</sup>/s) June 26, 1960; maximum elevation, 48.2 ft (14.69 m), present datum, July 4, 1940, at site 6,300 ft (1,920 m) upstream at bridge on State Highway 35, observed by Corps of Engineers, elevation 46.6 ft (14.20 m), adjusted to present site; no flow at times in 1951-53 and 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum elevation since 1869, 56.1 ft (17.10 m) Dec. 10, 1913. Flood in July 1869 probably reached about same elevation. Elevation of other floods are as follows: May 8, 1922, 55.4 ft (16.89 m); June 1929, 55.0 ft (16.76 m); June 22, 1935, 54.6 ft (16.64 m); Oct. 5, 1936, 52.2 ft (15.91 m); Aug. 2, 1938, 53.4 ft (16.28 m); Nov. 27, 1940, 47.6 ft (14.51 m). All above flood data from information by Texas and New Orleans Railroad Co. and adjusted to present site.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 50,300 ft<sup>3</sup>/s (1,420 m<sup>3</sup>/s) Apr. 24, elevation, 34.20 ft (10.424 m); minimum daily, 174 ft<sup>3</sup>/s (4.93 m<sup>3</sup>/s) Sept. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2130	13100	3540	1480	2070	2210	3050	8150	4760	811	766	940
2	2100	9130	4040	1490	3030	1960	3270	8510	4680	656	662	934
3	2180	4370	3850	1650	2570	2170	2990	8960	4470	614	652	744
4	2050	2820	3920	1590	4160	2500	3280	15300	4410	580	610	632
5	2060	2140	3570	1760	6050	2570	3350	19400	4320	537	470	617
6	1860	1770	2640	1870	4630	2560	3340	18300	4330	704	365	631
7	2080	1500	12500	2400	3340	2710	3180	10500	4380	604	314	531
8	2380	1370	22800	2400	2410	2860	3160	7290	4240	698	309	525
9	2020	1190	14900	1910	1920	2470	3090	6540	3940	813	417	620
10	1550	1100	7440	1960	1770	2360	2990	6290	3980	684	485	873
11	1120	1120	5220	2250	3040	2360	2590	5880	4100	619	382	1060
12	920	1060	8990	1780	15600	2330	1830	5580	4350	630	330	1010
13	838	968	19000	1530	20000	2170	1500	5390	4360	669	356	1860
14	840	900	16700	2800	18100	1760	1460	5310	3580	637	396	2730
15	807	856	12700	4280	13200	1480	1470	5220	3120	676	434	3380
16	827	832	10800	3340	7490	1440	1870	5170	4500	759	450	2880
17	949	948	8270	2870	5880	1380	9450	5080	4460	855	371	2080
18	2190	951	5840	2430	5310	1270	25100	5130	3670	921	363	1310
19	2210	1620	5190	1950	4890	1190	25900	4920	3040	1160	542	599
20	1820	3060	6590	1710	4530	1200	29900	4690	2600	1400	664	510
21	1500	2620	8420	2120	4130	1200	34200	4970	2070	1530	678	560
22	1510	2700	5990	2790	3300	1250	43500	5860	1720	1640	668	533
23	1790	3340	3760	3600	2670	1240	49100	5930	1490	1670	636	413
24	1410	2420	3510	3000	2400	1210	47700	5790	1390	1600	488	484
25	1290	1690	3260	2060	1800	1040	27100	5730	1320	1610	438	365
26	5610	1350	3260	1660	2020	1240	20500	5330	1070	1160	427	323
27	7930	1410	2800	1800	2350	1320	17200	5160	983	963	409	301
28	5400	4210	2310	1870	2380	1180	12400	8750	1020	845	377	239
29	3010	8830	2010	1580	---	1140	9340	9970	892	752	382	174
30	2940	5040	1740	1540	---	1070	8550	6650	803	709	536	194
31	12400	---	1540	1760	---	1540	---	5150	---	709	784	---
TOTAL	77721	84415	217100	67230	151040	54380	402360	230900	94048	28215	15161	28052
MEAN	2507	2814	7003	2169	5394	1754	13410	7448	3135	910	489	935
MAX	12400	13100	22800	4280	20000	2860	49100	19400	4760	1670	784	3380
MIN	807	832	1540	1480	1770	1040	1460	4690	803	537	309	174
AC-FT	154200	167400	430600	133400	299600	107900	798100	458000	186500	55960	30070	55640
CAL YR 1976	TOTAL	945246	MEAN	2583	MAX	22800	MIN	111	AC-FT	1875000		
WTR YR 1977	TOTAL	1450622	MEAN	3974	MAX	49100	MIN	174	AC-FT	2877000		

## TRES PALACIOS RIVER BASIN

08162600 TRES PALACIOS RIVER NEAR MIDFIELD, TX

LOCATION.--Lat 28°55'40", long 96°10'15", Matagorda County, Hydrologic Unit 12100401, at left downstream end of bridge on Farm Road 456, 1.0 mi (1.6 km) downstream from Juanita Creek, and 2.4 mi (3.9 km) southeast of Midfield.

DRAINAGE AREA.--145 mi<sup>2</sup> (376 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1970 to current year. Prior to October 1973, published as Tres Palacios Creek near Midfield.

GAGE.--Water-stage recorder. Datum of gage is 5.38 ft (1.640 m) above mean sea level.

REMARKS.--Water-discharge records good. Ten known diversions above stations (amounts unknown). An undetermined amount of water from irrigated ricefields enters stream upstream at various points. Recording rain gage located at station.

AVERAGE DISCHARGE.--7 years (water years 1971-77), 143 ft<sup>3</sup>/s (4.050 m<sup>3</sup>/s), 103,600 acre-ft/yr (128 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.-- Maximum discharge, 7,590 ft<sup>3</sup>/s (215 m<sup>3</sup>/s) Sept. 11, 1973, gage height, 31.11 ft (9.482 m); minimum, 2.2 ft<sup>3</sup>/s (0.062 m<sup>3</sup>/s) Feb. 1, 2, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stages since 1885, 37 ft (11.3 m) in September 1960 and 35 ft (10.7 m) in June 1945, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge		Gage height		Date	Time	Discharge		Gage height	
		(ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	(ft)	(m)			(ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	(ft)	(m)
Nov. 20	1000	*2,450	69.4	25.14	7.663	Dec. 15	0600	1,510	42.8	21.11	6.434
Dec. 13	0200	2,150	60.9	24.15	7.361	Dec. 20	1700	1,180	33.4	19.01	5.794

Minimum daily discharge, about 8.2 ft<sup>3</sup>/s (0.23 m<sup>3</sup>/s) Nov. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	81	114	30	19	15	19	44	21	29	40	36
2	40	45	73	74	20	15	52	91	28	29	45	63
3	25	26	48	185	24	16	39	49	25	41	43	39
4	17	22	34	142	23	18	27	45	18	38	38	24
5	55	14	28	86	24	16	24	41	17	29	35	16
6	80	11	51	102	20	16	25	41	17	42	47	15
7	59	9.0	470	128	18	15	26	48	19	79	46	12
8	38	8.8	340	72	16	14	20	53	17	108	40	60
9	34	8.6	130	58	16	13	27	50	17	92	42	57
10	32	8.4	67	51	91	14	27	39	17	88	33	72
11	25	8.2	213	36	385	16	26	31	20	71	27	69
12	16	15	1290	30	374	15	37	22	42	70	22	50
13	12	33	1860	28	161	15	25	29	51	62	16	151
14	10	18	1190	29	84	15	29	31	67	61	23	490
15	8.6	13	1410	30	48	13	23	31	274	61	41	566
16	54	12	859	32	34	14	100	30	602	56	47	493
17	97	10	385	26	27	14	327	26	185	53	51	242
18	49	11	195	23	24	15	213	25	65	73	44	120
19	36	866	227	20	23	15	101	20	43	84	58	78
20	43	2240	1050	20	22	16	340	21	36	99	71	59
21	31	1240	839	19	19	14	887	34	33	101	50	48
22	24	475	333	20	18	15	458	79	32	57	33	41
23	16	190	175	37	17	17	124	97	33	44	26	34
24	13	102	135	41	17	13	52	48	41	43	20	31
25	19	60	138	32	17	14	33	35	43	44	32	24
26	49	42	329	26	16	23	21	26	40	37	30	22
27	59	35	200	23	16	17	16	19	36	36	19	28
28	35	117	107	22	16	15	14	15	35	56	18	27
29	98	366	65	19	---	15	16	15	33	77	27	25
30	214	223	47	18	---	20	23	16	30	60	47	25
31	154	---	36	19	---	14	---	20	---	47	30	---
TOTAL	1502.6	6310.0	12439	1478	1589	477	3151	1171	1937	1867	1141	3017
MEAN	48.5	210	401	47.7	56.8	15.4	105	37.8	64.6	60.2	36.8	101
MAX	214	2240	1860	185	385	23	887	97	602	108	71	566
MIN	8.6	8.2	28	18	16	13	14	15	17	29	16	12
AC-FT	2980	12520	24670	2930	3150	946	6250	2320	3840	3700	2260	5980
(††)	3.80	4.76	5.33	2.24	1.35	.96	3.25	.55	3.52	4.11	3.82	4.06

CAL YR 1976 TOTAL 37046.6 MEAN 101 MAX 2240 MIN 4.2 AC-FT 73480 †† 40.03  
WTR YR 1977 TOTAL 36079.6 MEAN 98.8 MAX 2240 MIN 8.2 AC-FT 71560 †† 37.75

†† Rainfall, in inches.

08162600 TRES PALACIOS RIVER NEAR MIDFIELD, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1968 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	HARD- NESS (CA+MG) (MG/L)
OCT 20...	1400	42	524	7.5	16.0	60	10.0	104	3.3	150
NOV 24...	1255	105	278	7.5	15.0	130	9.3	95	3.3	87
JAN 10...	1315	51	555	7.7	7.0	75	9.2	78	2.6	160
FEB 22...	1330	18	1200	7.4	19.0	10	10.3	114	1.9	340
MAR 30...	1445	21	1030	7.5	23.5	40	8.2	99	3.5	290
MAY 13...	1115	37	1000	7.7	25.0	25	7.9	98	2.4	300
JUN 23...	1435	33	806	7.6	30.0	25	6.5	87	2.5	250
AUG 04...	1025	38	700	8.0	29.0	15	6.8	89	2.0	230
SEP 15...	1205	583	216	7.5	27.0	100	5.2	66	2.6	70
DATE	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
OCT 20...	9	42	11	46	1.6	6.5	172	0	13	72
NOV 24...	7	24	6.5	23	1.1	5.9	97	0	14	30
JAN 10...	17	45	12	52	1.8	4.0	176	0	18	80
FEB 22...	60	93	27	130	3.1	4.3	346	0	32	220
MAR 30...	49	78	22	120	3.1	4.4	288	0	39	170
MAY 13...	76	79	24	97	2.5	4.4	268	0	46	180
JUN 23...	29	69	19	72	2.0	3.1	270	0	33	110
AUG 04...	5	61	18	73	2.1	4.6	270	0	24	110
SEP 15...	0	20	4.8	15	.8	5.2	88	0	8.1	24
DATE	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 20...	.2	25	301	96	.35	.01	.03	.84	.39	5.5
NOV 24...	.3	14	166	212	.36	.01	.06	1.2	.31	14
JAN 10...	.2	14	312	164	.56	.02	.10	1.1	.30	7.5
FEB 22...	.4	15	692	26	.61	.01	.02	.51	.29	5.3
MAR 30...	.6	17	593	82	1.5	.14	.20	1.1	.54	--
MAY 13...	.5	13	576	51	.51	.02	.03	1.6	.12	6.7
JUN 23...	.4	25	465	57	.33	.09	.51	.79	.14	9.6
AUG 04...	.4	23	447	32	.00	.01	.00	.71	.23	6.7
SEP 15...	.1	3.6	124	230	.37	.02	.04	.86	.41	10



TRES PALACIOS RIVER BASIN  
08162600 TRES PALACIOS RIVER NEAR MIDFIELD, TX---Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
NOV 24...	1255	2	100	0	0	5	140
MAR 30...	1445	3	200	0	1	2	20
AUG 04...	1025	6	400	0	0	2	60

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
NOV 24...	2	5	.0	0	0	8
MAR 30...	0	30	.0	0	0	10
AUG 04...	0	10	.0	0	0	4

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
NOV 24...	1255	.0	2	.00	.00	.0	.0	5	.00	.0	.00	28
MAR 30...	1445	.0	0	.00	.00	.0	.0	1	.00	.9	.00	1.5
AUG 04...	1025	.0	0	.00	.00	.0	.0	0	.00	.4	.00	.4

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
NOV 24...	.00	6.5	.00	.00	3.7	.00	.0	.00	.00	.0	.00	.3
MAR 30...	.00	.8	.09	.01	.4	.00	.0	.00	.00	.0	.00	.0
AUG 04...	.00	.2	.01	.01	.2	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 24...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
MAR 30...	.00	.0	.00	.00	.00	.00	0	0	.00	.05	.00	.00
AUG 04...	.00	.0	.00	.03	.00	.03	0	0	.00	.00	.00	.00

## CASHS CREEK BASIN

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08162650 CASHS CREEK NEAR BLESSING, TX  
(Low-flow partial-record station)

LOCATION.--Lat 28°48'38", long 96°11'51", Matagorda County, Hydrologic Unit 12100401, at bridge on county road, 2.0 mi (3.2 km) upstream from Farm Road 521, and 4.4 mi (7.1 km) southeast of Blessing.

DRAINAGE AREA.--14.8 mi<sup>2</sup> (38.3 km<sup>2</sup>).

PERIOD OF RECORD.--Occasional discharge measurements: March 1969 to current year. Occasional water-quality data: October 1968 to September 1977 (discontinued).

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA+MG)
OCT 20...	0935	1.8	700	7.4	14.0	15	8.7	87	2.0	180
NOV 23...	1625	8.6	338	7.4	14.0	75	9.0	90	3.5	95
JAN 05...	1535	11	392	7.3	12.5	75	9.6	93	2.8	110
FEB 18...	0925	1.8	1140	7.4	14.5	20	7.7	77	1.9	320
MAR 30...	1650	2.1	1270	7.4	23.0	45	6.5	77	5.8	330
MAY 12...	1355	1.3	1090	7.7	24.0	25	7.1	87	2.9	300
JUN 22...	1530	2.2	770	7.5	28.5	15	5.5	71	1.2	220
AUG 04...	1540	.55	1020	7.8	28.5	3	5.8	75	1.9	310

DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT 20...	26	44	17	71	2.3	6.0	187	0	21	120
NOV 23...	14	24	8.4	32	1.4	5.0	98	0	19	43
JAN 05...	6	30	9.5	37	1.5	3.5	132	0	16	50
FEB 18...	33	75	31	130	3.2	3.5	344	0	43	190
MAR 30...	0	78	33	160	3.8	3.9	416	0	45	230
MAY 12...	24	73	29	120	3.0	2.9	339	0	37	180
JUN 22...	19	55	19	79	2.3	3.0	240	0	26	120
AUG 04...	24	75	30	130	3.2	2.9	350	0	33	190

DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 20...	.3	22	394	20	.37	.02	.00	.99	.26	6.6
NOV 23...	.4	14	194	128	.79	.03	.06	1.1	.18	13
JAN 05...	.2	13	224	200	.21	.01	.05	1.1	.20	12
FEB 18...	.5	13	656	38	.44	.01	.03	.53	.37	6.5
MAR 30...	.7	11	767	87	.10	.01	.08	1.4	.47	--
MAY 12...	.7	15	625	36	.24	.01	.04	1.1	.38	7.7
JUN 22...	.5	20	441	34	.15	.01	.05	.62	.32	8.9
AUG 04...	.7	16	650	5	.07	.01	.00	.55	.16	4.9

## CASHS CREEK BASIN

08162650 CASHS CREEK NEAR BLESSING, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV 23...	1625	2	100	0	0	5	130
MAR 30...	1650	3	200	0	3	0	20
AUG 04...	1540	4	400	0	0	1	20

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV 23...	0	6	.0	0	0	4
MAR 30...	3	30	.0	0	0	10
AUG 04...	0	20	.0	1	0	0

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MATERIAL (UG/KG)	POLY-CHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL CHLORDANE (UG/L)	CHLORDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MATERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MATERIAL (UG/KG)
NOV 23...	1625	.0	0	.00	.00	.0	.0	0	.00	.0	.00	3.0
MAR 30...	1650	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0
AUG 04...	1540	.0	0	.00	.00	.0	.0	0	.00	.0	.00	1.2

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MATERIAL (UG/KG)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	DI-ELDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	HEPTACHLOR IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	HEPTACHLOR EPOXIDE IN BOTTOM MATERIAL (UG/KG)
NOV 23...	.00	.0	.00	.00	.4	.00	.0	.00	.00	.0	.00	.0
MAR 30...	.00	.0	.01	.01	.1	.00	.0	.00	.00	.0	.00	.0
AUG 04...	.00	.0	.00	.00	.1	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOXAPHENE IN BOTTOM MATERIAL (UG/KG)	TOTAL TRIETHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL STLVEX (UG/L)
NOV 23...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.39	.00
MAR 30...	.00	.0	.00	.00	.00	.00	0	0	.00	.27	.02	.00
AUG 04...	.00	.0	.00	.00	.00	.00	0	10	.00	.00	.00	.00

08162700 EAST CARANCAHUA CREEK NEAR BLESSING, TX  
(Reconnaissance partial-record station)

LOCATION.--Lat 28°51'48", long 96°17'05", Matagorda County, Hydrologic Unit 12100401, at bridge on Farm Road 616, 100 ft (30 m) downstream from Missouri Pacific Railroad bridge, and 4.2 mi (6.8 km) west of Blessing.

DRAINAGE AREA.--81.2 mi<sup>2</sup> (210.3 km<sup>2</sup>).

PERIOD OF RECORD.--Periodic discharge measurements: September 1967 to July 1968, February 1970 to current year. Periodic water-quality data: February 1968 to current year.

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA+MG) (MG/L)
OCT 20...	1120	27	491	7.6	15.0	80	10.0	102	2.7	140
NOV 24...	0935	75	309	7.6	15.0	130	9.4	96	3.7	93
JAN 05...	1345	51	451	7.3	10.5	75	10.4	96	2.8	140
FEB 18...	1015	12	1030	7.7	16.0	25	8.9	93	1.9	310
MAR 30...	1220	4.3	1480	7.7	23.0	25	8.1	96	1.2	400
MAY 12...	1205	8.5	1070	8.0	25.5	25	9.2	115	4.8	250
JUN 22...	1430	12	733	7.9	31.5	30	8.0	108	2.0	200
AUG 09...	1010	3.9	942	7.9	30.0	20	6.0	80	2.6	240
SEP 14...	1525	89	292	7.7	27.5	150	6.6	85	3.7	82
DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT 20...	14	34	13	45	1.7	5.0	152	0	17	70
NOV 24...	3	23	8.7	27	1.2	5.0	110	0	14	36
JAN 05...	22	34	13	40	1.5	3.9	142	0	20	61
FEB 18...	56	70	32	110	2.7	4.0	305	0	49	170
MAR 30...	80	82	47	190	4.1	2.9	388	0	66	300
MAY 12...	2	56	27	130	3.6	4.3	304	0	65	160
JUN 22...	0	49	20	76	2.3	2.6	260	0	19	100
AUG 09...	10	53	26	100	2.8	4.1	280	0	31	150
SEP 14...	0	21	7.1	27	1.3	1.4	100	0	9.5	40
DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SI02) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 20...	.8	17	277	132	.04	.01	.03	1.1	.14	9.4
NOV 24...	.3	13	181	236	.11	.00	.08	1.4	.13	16
JAN 05...	.3	13	255	188	.10	.01	.03	1.1	.15	13
FEB 18...	.5	11	597	47	.04	.01	.02	.68	.05	12
MAR 30...	.8	13	893	48	.11	.03	.05	.68	.09	--
MAY 12...	.7	15	608	40	.37	.05	4.3	1.2	.10	6.4
JUN 22...	.5	21	416	62	.01	.00	.02	.73	.09	15
AUG 09...	.6	22	525	32	.01	.01	.01	.76	.05	6.1
SEP 14...	.2	20	175	340	.38	.00	.05	.91	.22	16

## EAST CARANCAHUA CREEK BASIN

08162700 EAST CARANCAHUA CREEK NEAR BLESSING, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
NOV 24...	0935	1	100	0	0	4	130
MAR 30...	1220	3	200	0	4	0	10
AUG 09...	1010	2	300	0	0	1	30

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
NOV 24...	2	1	.0	0	0	10
MAR 30...	0	20	.0	0	0	10
AUG 09...	0	0	.0	1	0	6

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
NOV 24...	0935	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.1
MAR 30...	1220	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0
AUG 09...	1010	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
NOV 24...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
MAR 30...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
AUG 09...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 24...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
MAR 30...	.00	.0	.00	.00	.00	.00	0	0	.00	.01	.00	.00
AUG 09...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.02	.00

## EAST CARANCAHUA CREEK BASIN

219

08162800 WEST CARANCAHUA CREEK NEAR LAWARD, TX  
(Reconnaissance partial-record station)

LOCATION.--Lat 28°53'19", long 96°27'03", Jackson County, Hydrologic Unit 12100401, at bridge on county road, 3.2 mi (5.1 km) northeast of Laward, 3.8 mi (6.1 km) upstream from Lunis Creek, and 6.3 mi (10.1 km) upstream from Missouri Pacific Railroad bridge and Farm Road 616.

DRAINAGE AREA.--57.1 mi<sup>2</sup> (147.9 km<sup>2</sup>).

PERIOD OF RECORD.--Periodic discharge measurements: September 1967 to July 1968, February 1970 to current year. Periodic water-quality data: February 1968 to September 1977 (discontinued).

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA+MG) (MG/L)
OCT 19...	1345	21	341	7.5	19.5	65	9.2	103	2.3	100
NOV 23...	1430	39	228	7.5	14.0	90	9.6	96	3.8	73
JAN 05...	1145	14	226	7.4	11.0	160	10.6	99	3.0	70
FEB 18...	1130	.60	430	7.9	18.0	95	10.0	109	3.2	130
MAY 12...	1030	.10	564	8.0	26.0	15	9.3	116	3.0	170
JUN 22...	1315	5.9	520	8.2	31.5	20	9.0	122	3.2	170
AUG 08...	1535	3.0	623	9.1	34.5	30	16.1	227	7.3	170

DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT 19...	13	30	7.2	26	1.1	8.9	112	0	9.2	45
NOV 23...	4	21	5.0	15	.8	8.4	84	0	12	21
JAN 05...	0	20	4.9	18	.9	5.0	88	0	8.9	24
FEB 18...	17	38	8.6	36	1.4	6.6	138	0	18	56
MAY 12...	25	49	11	47	1.6	6.3	174	0	23	82
JUN 22...	18	50	12	41	1.4	4.5	190	0	9.4	67
AUG 08...	11	44	14	51	1.7	9.5	150	20	13	100

DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 19...	.3	26	208	130	.00	.01	.06	.88	.13	9.4
NOV 23...	.3	17	141	148	.22	.01	.02	1.1	.23	15
JAN 05...	.3	14	138	276	.14	.01	.04	1.5	.25	16
FEB 18...	.2	8.9	240	172	.00	.01	.03	1.2	.15	12
MAY 12...	.4	10	314	14	.03	.01	.03	1.1	.08	11
JUN 22...	.3	24	302	36	.06	.03	.03	.81	.13	10
AUG 08...	.3	22	348	74	.12	.06	.20	1.2	.07	12



## EAST CARANCAHUA CREEK BASIN

08162800 WEST CARANCAHUA CREEK NEAR LAWARD, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

				DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)			
		DATE	TIME									
		NOV 23...	1430	4	100	0	0	3	110			
		AUG 08...	1535	6	300	0	0	3	30			
				DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)			
		DATE										
		NOV 23...		0	5	.0	0	0	5			
		AUG 08...		0	0	.0	1	0	0			
DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
NOV 23...	1430	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0
AUG 08...	1535	.0	0	.00	.00	.0	.0	0	.00	.2	.00	.5
DATE	TIME	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
NOV 23...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
AUG 08...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
DATE	TIME	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 23...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
AUG 08...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00

## 08163500 LAVACA RIVER AT HALLETTSVILLE, TX

LOCATION.--Lat 29°26'35", long 96°56'39", Lavaca County, Hydrologic Unit 12100101, on left bank 75 ft (23 m) downstream from bridge on U.S. Highway 77 in Hallettsville and 0.7 mi (1.1 km) downstream from Campbell Branch.

DRAINAGE AREA.--108 mi<sup>2</sup> (280 km<sup>2</sup>).

PERIOD OF RECORD.--July 1939 to current year.

REVISED RECORDS.--WSP 1312: 1942(M), 1944(M). WSP 1732: 1952(M). WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 186.72 ft (56.912 m) above mean sea level. Prior to Apr. 19, 1960, water-stage recorder for high stages and movable nonrecording gage for stages below about 6.2 ft (1.89 m). Apr. 20, 1960, to June 2, 1961, movable nonrecording gage. All gages at same site and datum.

REMARKS.--Records good. No diversion above station. The Corps of Engineers began channel rectification 1.6 mi (2.6 km) downstream from gage in April 1959. This rectification reached the gage Sept. 21, 1959, and was completed in February 1960. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--38 years, 48.7 ft<sup>3</sup>/s (1.379 m<sup>3</sup>/s), 6.12 in/yr (155 mm/yr), 35,280 acre-ft/yr (43.5 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 93,100 ft<sup>3</sup>/s (2,640 m<sup>3</sup>/s) June 30, 1940, gage height, 40.60 ft (12.375 m), from flood-marks, from rating curve extended above 23,000 ft<sup>3</sup>/s (651 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow at times in 1953 and 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1840, that of June 30, 1940; maximum stage from about 1870 to 1940, 32.8 ft (10.00 m) July 16, 1936, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,300 ft<sup>3</sup>/s (65.1 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 16	0700	2,760 78.2	18.76 5.718	Feb. 11	0100	4,210 119	20.19 6.154
Oct. 29	1500	3,710 105	20.15 6.142	Apr. 20	1400	*13,200 374	26.98 8.224
Dec. 5	2000	7,600 215	24.04 7.327				

Minimum discharge, 0.80 ft<sup>3</sup>/s (0.023 m<sup>3</sup>/s) Sept. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	6.7	38	24	34	74	24	20	44	11	6.6	2.5	1.3		
2	5.2	29	20	39	46	24	22	32	10	6.3	2.5	1.2		
3	4.5	24	18	49	532	39	23	31	10	7.2	2.5	1.2		
4	4.3	22	16	44	125	36	20	26	9.5	6.3	2.4	1.1		
5	178	19	2470	39	58	32	18	23	9.0	5.3	2.9	1.0		
6	59	17	4160	38	46	26	16	22	8.5	5.2	2.4	1.1		
7	16	16	469	38	40	24	16	20	8.0	4.9	2.5	1.2		
8	10	15	107	36	37	23	16	20	7.9	4.8	2.4	1.7		
9	7.6	14	74	41	35	22	15	20	8.0	5.0	2.3	1.7		
10	6.2	13	64	39	723	23	15	18	7.5	4.8	2.2	1.7		
11	5.2	13	1070	33	2450	24	15	18	12	4.3	2.2	1.7		
12	4.5	12	201	32	465	23	15	17	11	4.1	2.2	1.6		
13	4.4	13	110	43	113	22	15	16	9.0	3.9	2.2	2.8		
14	4.2	12	942	63	73	21	28	15	8.0	4.0	2.7	2.9		
15	18	13	302	46	56	21	34	15	8.1	4.9	3.8	2.8		
16	1450	13	99	37	46	21	666	15	7.8	4.9	2.5	2.2		
17	107	13	69	32	41	21	381	14	11	4.4	2.2	2.1		
18	31	12	58	30	38	21	62	14	9.2	4.2	1.8	1.9		
19	24	121	489	29	36	20	38	14	8.7	5.1	1.8	1.9		
20	207	126	852	28	34	19	7410	14	8.3	5.6	1.8	1.9		
21	40	39	110	28	32	19	708	20	8.1	4.0	1.6	1.9		
22	18	22	70	30	32	18	110	28	7.9	3.4	1.4	1.9		
23	12	17	62	40	32	18	65	19	7.9	3.4	1.3	2.0		
24	320	15	55	43	29	19	49	330	7.6	3.2	1.3	2.0		
25	632	15	67	34	27	21	41	39	7.2	2.9	1.3	2.1		
26	67	168	68	30	26	28	35	21	6.8	2.9	1.3	2.1		
27	29	71	50	29	25	30	32	16	6.6	3.6	1.3	2.1		
28	19	32	44	28	26	42	29	14	7.0	3.4	1.3	2.1		
29	1700	30	40	26	---	37	27	13	6.8	3.4	1.3	2.2		
30	498	28	38	49	---	25	35	12	6.8	3.0	1.4	2.2		
31	70	---	35	327	---	22	---	11	---	2.5	1.4	---		
TOTAL	5557.8	992	12253	1434	5297	765	9976	931	255.2	137.5	62.7	55.6		
MEAN	179	33.1	395	46.3	189	24.7	333	30.0	8.51	4.44	2.02	1.85		
MAX	1700	168	4160	327	2450	42	7410	330	12	7.2	3.8	2.9		
MIN	4.2	12	16	26	25	18	15	11	6.6	2.5	1.3	1.0		
CFSM	1.66	.31	3.66	.43	1.75	.23	3.08	.28	.08	.04	.02	.02		
IN.	1.91	.34	4.22	.49	1.82	.26	3.44	.32	.09	.05	.02	.02		
AC-FT	11020	1970	24300	2840	10510	1520	19790	1850	506	273	124	110		
CAL YR 1976	TOTAL	28066.9	MEAN	76.7	MAX	4160	MIN	1.9	CFSM	.71	IN	9.67	AC-FT	55670
WTR YR 1977	TOTAL	37716.8	MEAN	103	MAX	7410	MIN	1.0	CFSM	.95	IN	12.99	AC-FT	74810

## LAVACA RIVER BASIN

08164000 LAVACA RIVER NEAR EDNA, TX

LOCATION.--Lat 28°57'35", long 96°41'10", Jackson County, Hydrologic Unit 12100101, at downstream side near center of upstream bridge of two bridges on U.S. Highway 59, 660 ft (201 m) upstream from Texas and New Orleans Railroad Co. bridge, and 2.8 mi (4.5 km) southwest of Edna.

DRAINAGE AREA.--817 mi<sup>2</sup> (2,116 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1938 to current year.

REVISED RECORDS.--WSP 1923: 1955. WDR TX-73-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 13.88 ft (4.231 m) above mean sea level. Prior to June 6, 1939, nonrecording gage (property of Corps of Engineers); June 6, 1939, to Apr. 3, 1957, nonrecording gage at site 110 ft (34 m) downstream; Apr. 4, 1957, to Mar. 21, 1961, nonrecording gage; all at same datum.

REMARKS.--Water-discharge records good. Small diversions above station for irrigation.

AVERAGE DISCHARGE.--39 years, 316 ft<sup>3</sup>/s (8,949 m<sup>3</sup>/s), 5.25 in/yr (133 mm/yr), 228,900 acre-ft/yr (282 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 73,000 ft<sup>3</sup>/s (2,070 m<sup>3</sup>/s) July 1, 1940, gage height, 32.51 ft (9.909 m); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1880, 33.8 ft (10.30 m) May 25, 1936, discharge, 83,400 ft<sup>3</sup>/s (2,360 m<sup>3</sup>/s), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,100 ft<sup>3</sup>/s (116 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 31	0600	6,760 191	21.85 6.660	Dec. 21	1100	6,200 176	21.38 6.517
Dec. 8	1100	*13,100 371	24.28 7.401	Feb. 13	0600	7,450 211	22.27 6.788
Dec. 13	1100	4,310 122	19.02 5.797	Apr. 23	0200	8,350 236	22.71 6.922
Dec. 15	2100	6,590 187	21.71 6.617				

Minimum discharge, 27 ft<sup>3</sup>/s (0.76 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	190	2520	278	303	762	209	173	315	107	93	42	32
2	108	552	224	301	549	205	176	876	401	88	40	33
3	82	356	187	378	899	207	170	374	273	83	38	33
4	65	297	165	398	1560	214	167	284	164	79	37	32
5	87	253	167	346	1030	227	162	244	130	74	39	32
6	328	223	3330	324	453	233	146	225	114	85	39	30
7	530	197	7990	346	333	211	134	207	105	82	40	29
8	246	176	12000	312	290	196	128	194	98	77	39	36
9	141	161	4980	298	264	190	124	188	94	82	38	47
10	107	149	838	295	750	187	121	191	92	74	37	52
11	88	140	1580	285	3790	189	126	197	92	66	37	61
12	77	132	3080	261	6530	190	122	188	95	66	36	54
13	68	134	3870	272	6770	187	125	173	113	65	36	47
14	62	171	2560	601	1980	182	138	156	119	62	35	393
15	57	146	5640	584	701	178	147	149	1190	70	46	349
16	491	129	5270	401	513	175	486	144	2340	65	44	140
17	1720	121	1340	303	413	174	2800	141	751	58	43	95
18	1910	116	754	265	358	173	1920	136	335	63	43	70
19	1380	431	791	241	328	171	591	136	222	64	40	56
20	400	1370	3760	230	308	165	1070	136	170	61	38	51
21	600	931	5940	223	292	159	4060	150	136	60	36	47
22	500	428	3120	224	280	152	6640	182	124	57	36	43
23	400	264	822	460	271	146	5650	210	113	53	36	41
24	500	204	641	896	260	149	700	197	357	50	34	37
25	1770	175	668	561	249	152	457	237	421	48	32	35
26	2390	175	1670	356	238	153	358	271	237	47	32	33
27	903	263	1030	295	225	165	318	160	162	46	33	32
28	331	401	584	268	217	183	293	132	125	44	33	32
29	1070	377	438	243	---	198	270	121	108	44	33	30
30	4750	378	367	225	---	225	254	115	100	44	32	27
31	6440	---	327	218	---	194	---	109	---	43	32	---
TOTAL	27791	11370	74411	10713	30613	5739	28026	6538	8888	1993	1156	2029
MEAN	896	379	2400	346	1093	185	934	211	296	64.3	37.3	67.6
MAX	6440	2520	12000	896	6770	233	6640	876	2340	93	46	393
MIN	57	116	165	218	217	146	121	109	92	43	32	27
CFSM	1.10	.46	2.94	.42	1.34	.23	1.14	.26	.36	.08	.05	.08
IN.	1.27	.52	3.39	.49	1.39	.26	1.28	.30	.40	.09	.05	.09
AC-FT	55120	22550	147600	21250	60720	11380	55590	12970	17630	3950	2290	4020
CAL YR 1976	TOTAL	180567	MEAN 493	MAX 12000	MIN 29	CFSM .60	IN 8.22	AC-FT 358200				
WTR YR 1977	TOTAL	209267	MEAN 573	MAX 12000	MIN 27	CFSM .70	IN 9.53	AC-FT 415100				

## LAVACA RIVER BASIN

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08164000 LAVACA RIVER NEAR EDNA, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1960 to current year. Pesticide analyses: January 1968 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	HARD- NESS (CA, MG) (MG/L)	
NOV 18...	0915	120	744	8.0	11.0	9.1	85	.8	280	
JAN 13...	1030	250	755	7.8	13.0	10.1	99	.9	300	
MAR 17...	0915	170	790	8.0	21.5	8.0	93	1.2	300	
MAY 12...	0935	180	781	7.5	22.0	7.9	93	2.5	300	
JUL 14...	0850	85	751	7.8	27.0	6.9	87	1.7	260	
SEP 15...	0900	370	195	7.5	24.5	6.6	80	4.1	71	
DATE		NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)
NOV 18...	16	100	6.3	54	1.4	3.2	317	0	26	
JAN 13...	22	110	6.5	54	1.4	2.5	341	0	30	
MAR 17...	13	110	7.0	60	1.5	2.4	354	0	30	
MAY 12...	15	110	6.6	54	1.4	2.4	350	0	27	
JUL 14...	0	94	6.5	59	1.6	2.4	320	0	24	
SEP 15...	5	25	2.0	15	.8	3.1	80	0	8.6	
DATE		DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)
NOV 18...	73	.4	22	441	.50	.00	.01	.26	.09	
JAN 13...	80	.4	20	472	.68	.01	.04	.47	.09	
MAR 17...	88	.3	21	493	.46	.00	.03	.47	.08	
MAY 12...	77	.4	23	473	.41	.01	.01	.65	.10	
JUL 14...	75	.4	26	445	.11	.01	.07	1.18	.09	
SEP 15...	20	.2	10	123	.16	.01	.05	1.3	.19	

LAVACA RIVER BASIN  
08164000 LAVACA RIVER NEAR EDNA, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL PCB	PCB IN	POLY-CHLO-	TOTAL ALDRIN	ALDRIN IN	TOTAL CHLOR-	CHLOR-	TOTAL DDD	DDD IN	TOTAL DDE	DDE IN	
		(UG/L)	BOTTOM MA-TERIAL (UG/KG)	RINATED NAPH-THA-LENES (UG/L)		BOTTOM MA-TERIAL (UG/KG)	DANE IN BOTTOM MA-TERIAL (UG/KG)	BOTTOM MA-TERIAL (UG/KG)		BOTTOM MA-TERIAL (UG/KG)			
JAN 13...	1030	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0	
JUL 14...	0850	.0	1	.00	.00	.0	.0	0	.00	.0	.00	.0	
DATE		TOTAL DDT	DDT IN	TOTAL DI-	DI-ELDRIN	TOTAL ENDRIN	ENDRIN IN	TOTAL ETHION	TOTAL HEPTA-	HEPTA-	TOTAL HEPTA-	HEPTA-	
		(UG/L)	BOTTOM MA-TERIAL (UG/KG)	AZINON (UG/L)	IN BOTTOM MA-TERIAL (UG/KG)	(UG/L)	BOTTOM MA-TERIAL (UG/KG)	(UG/L)	CHLOR (UG/L)	CHLOR IN BOTTOM MA-TERIAL (UG/KG)	CHLOR EPOXIDE (UG/L)	CHLOR EPOXIDE IN BOT-TOM MA-TERIAL (UG/KG)	
JAN 13...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0	
JUL 14...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0	
DATE		TOTAL LINDANE	LINDANE IN	TOTAL MALA-	TOTAL METHYL	TOTAL METHYL	TOTAL PARA-	TOTAL TOX-	TOX-	TOTAL TRI-	TOTAL 2,4-D	TOTAL 2,4,5-T	TOTAL SILVEX
		(UG/L)	BOTTOM MA-TERIAL (UG/KG)	THION (UG/L)	PARA-THION (UG/L)	TRI-THION (UG/L)	THION (UG/L)	APHENE (UG/L)	APHENE IN BOTTOM MA-TERIAL (UG/KG)	THION (UG/L)	(UG/L)	(UG/L)	(UG/L)
JAN 13...	.00	.0	.00	.00	.00	.00	.00	0	0	.00	.00	.00	.00
JUL 14...	.00	.0	.00	.00	.00	.00	.00	0	0	.00	.04	.00	.00

## LAVACA RIVER BASIN

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08164300 NAVIDAD RIVER NEAR HALLETTSVILLE, TX

LOCATION.--Lat 29°28'00", long 96°48'45", Lavaca County, Hydrologic Unit 12100102, on right bank 28 ft (9 m) downstream from bridge on U.S. Highway 90-A, 0.8 mi (1.3 km) downstream from Mixons Creek, 1.2 mi (1.9 km) southwest of Sublime, and 8 mi (13 km) northeast of Hallettsville.

DRAINAGE AREA.--332 mi<sup>2</sup> (860 km<sup>2</sup>).

PERIOD OF RECORD.--October 1961 to current year.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 159.28 ft (48.549 m) above mean sea level.

REMARKS.--Records good. No known diversion above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--16 years, 160 ft<sup>3</sup>/s (4.531 m<sup>3</sup>/s), 6.54 in/yr (166 mm/yr), 115,900 acre-ft/yr (143 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,500 ft<sup>3</sup>/s (1,520 m<sup>3</sup>/s) Sept. 13, 1974, gage height, 36.05 ft (10.988 m); no flow Aug. 5-7, 22, Sept. 2-16, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1860, 40 ft (12.2 m) in June 1940; flood in July 1936 reached a stage of 39 ft (11.9 m), from information by local residents and Southern Pacific Railroad Co.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,500 ft<sup>3</sup>/s (70.8 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 30	1400	4,340 123	22.34 6.809	Feb. 11	2300	6,760 191	24.16 7.364
Dec. 7	0300	9,520 270	26.05 7.940	Apr. 17	1400	4,760 135	22.79 6.946
Dec. 20	0430	2,870 81.3	20.10 6.126	Apr. 21	0300	*19,300 547	30.01 9.147

Minimum discharge, 3.9 ft<sup>3</sup>/s (0.11 m<sup>3</sup>/s) Sept. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	20	181	68	97	224	71	65	168	43	25	10	6.1		
2	14	130	62	109	129	72	78	132	42	23	9.4	6.4		
3	12	102	57	144	1110	86	85	108	41	22	9.1	5.8		
4	12	87	54	132	580	120	77	97	39	21	8.6	5.3		
5	49	76	1080	113	194	112	63	89	38	20	8.2	4.6		
6	91	69	7850	110	139	85	55	86	37	20	8.2	4.1		
7	27	65	7480	110	114	76	54	82	36	22	8.5	4.3		
8	21	60	963	102	100	73	52	79	35	22	8.8	7.3		
9	20	57	248	109	93	71	51	77	34	21	8.8	10		
10	18	56	217	110	402	73	50	74	33	19	8.2	16		
11	17	55	1430	90	4620	76	49	72	32	17	8.5	10		
12	15	51	1330	87	4520	74	48	69	38	16	8.5	7.6		
13	15	52	313	120	499	69	50	67	38	15	8.2	8.2		
14	14	54	1290	206	248	66	70	65	35	15	11	12		
15	21	55	1480	154	199	66	84	62	37	15	8.2	14		
16	1360	53	296	106	165	64	1180	59	45	16	7.9	12		
17	483	51	232	87	149	62	3880	57	42	15	7.3	8.8		
18	90	50	198	80	137	61	775	56	36	15	7.0	8.5		
19	64	126	582	75	129	59	203	55	33	15	7.3	8.2		
20	287	263	2050	74	118	53	5950	55	31	19	7.0	7.4		
21	120	129	344	74	110	51	13500	64	30	18	6.4	7.6		
22	62	75	216	76	107	49	1580	84	30	15	5.8	7.0		
23	48	58	193	90	105	48	275	68	33	14	5.6	6.7		
24	158	54	175	98	95	50	225	189	48	13	5.3	6.4		
25	1010	53	200	84	86	66	194	62	41	12	5.6	5.8		
26	210	82	193	76	84	79	168	53	34	11	5.3	5.3		
27	103	163	153	74	77	79	148	50	31	10	5.6	5.1		
28	75	87	138	71	73	106	132	49	30	14	7.0	4.8		
29	1270	83	122	62	---	117	120	47	28	13	7.3	4.6		
30	3930	76	115	80	---	80	118	46	27	11	7.3	4.3		
31	791	---	104	472	---	68	---	44	---	10	6.7	---		
TOTAL	10427	2553	29233	3472	14606	2282	29379	2365	1077	514	236.6	224.2		
MEAN	336	85.1	943	112	522	73.6	979	76.3	35.9	16.6	7.63	7.47		
MAX	3930	263	7850	472	4620	120	13500	189	48	25	11	16		
MIN	12	50	54	62	73	48	48	44	27	10	5.3	4.1		
CFSM	1.01	.26	2.84	.34	1.57	.22	2.95	.23	.11	.05	.02	.02		
IN.	1.17	.29	3.28	.39	1.64	.26	3.29	.26	.12	.06	.03	.03		
AC-FT	20680	5060	57980	6890	28970	4530	58270	4690	2140	1020	469	445		
CAL YR 1976	TOTAL	66982.9	MEAN	183	MAX	7850	MIN	6.1	CFSM	.55	IN	7.51	AC-FT	132900
WTR YR 1977	TOTAL	96368.8	MEAN	264	MAX	13500	MIN	4.1	CFSM	.80	IN	10.80	AC-FT	191100



## LAVACA RIVER BASIN

08164495 SANDY CREEK NEAR GANADO, TX  
(Reconnaissance partial-record station)

LOCATION.--Lat 29°01'41", long 96°33'16", Jackson County, Hydrologic Unit 12100102, 300 ft (91 m) upstream from Navidad River and 2.6 mi (4.2 km) west of Ganado.

DRAINAGE AREA.--467 mi<sup>2</sup> (1,210 km<sup>2</sup>).

PERIOD OF RECORD.--Periodic discharge measurements: 1950, November 1953 to current year (in conjunction with station 08164500, Navidad River near Ganado). Periodic water-quality data: October 1975 to September 1977 (discontinued).

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA+MG)
NOV 24...	1615	134	171	7.3	15.5	85	9.9	102	3.1	45
JAN 11...	1045	105	179	7.7	5.0	50	12.4	100	1.8	56
FEB 22...	1600	46	203	6.7	19.0	40	8.4	93	2.0	69
MAR 31...	1330	11	359	7.3	19.0	6	8.9	99	1.9	110
MAY 16...	1520	18	525	--	27.5	15	11.6	149	6.7	140
JUN 24...	1150	37	298	7.6	30.0	20	7.8	104	1.9	83
AUG 03...	1610	4.6	652	8.3	36.5	6	8.0	116	3.1	150
SEP 16...	1250	255	504	7.9	29.5	25	7.0	92	2.4	150

DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
NOV 24...	1	12	3.6	16	1.0	5.8	53	0	13	19
JAN 11...	7	17	3.4	14	.8	3.7	60	0	9.0	21
FEB 22...	8	21	4.1	14	.7	3.8	75	0	8.3	21
MAR 31...	20	36	5.9	27	1.1	3.4	115	0	10	47
MAY 16...	20	40	9.4	52	1.9	4.5	132	6	31	79
JUN 24...	0	24	5.6	30	1.4	2.8	110	0	8.0	33
AUG 03...	0	41	12	98	3.5	3.1	230	8	24	110
SEP 16...	4	36	15	45	1.6	7.3	180	0	12	73

DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
NOV 24...	.3	11	107	124	.01	.00	.01	.74	.11	14
JAN 11...	.0	8.2	106	100	.10	.01	.04	.82	.07	8.7
FEB 22...	.1	10	119	66	.08	.00	.01	.68	.06	8.2
MAR 31...	.1	9.0	195	11	.01	.00	.02	.47	.05	--
MAY 16...	.4	9.6	297	33	.28	.01	.07	.93	.08	9.0
JUN 24...	.2	19	177	38	.01	.00	.02	.69	.08	12
AUG 03...	.4	20	430	11	.00	.01	.00	.74	.07	5.9
SEP 16...	.3	44	321	7	.10	.01	.02	.81	.25	14

08164495 SANDY CREEK NEAR GANADO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV 24...	1615	2	100	0	0	4	160
MAR 31...	1330	1	100	0	1	0	40
AUG 03...	1610	4	300	0	0	2	40

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV 24...	3	0	.0	0	0	5
MAR 31...	0	20	.0	0	0	10
AUG 03...	0	20	.0	3	0	20

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDF IN BOTTOM MA- TERIAL (UG/KG)
NOV 24...	1615	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0
MAR 31...	1330	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0
AUG 03...	1610	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
NOV 24...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
MAR 31...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
AUG 03...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 24...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
MAR 31...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
AUG 03...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00

## LAVACA RIVER BASIN

08164500 NAVIDAD RIVER NEAR GANADO, TX  
(National stream-quality accounting network)

LOCATION.--Lat 29°01'32", long 96°33'08"; Jackson County, Hydrologic Unit 12100102, at downstream side near center of upstream bridge of two bridges on U.S. Highway 59; 170 ft (52 m) upstream from Texas and New Orleans Railroad Co. bridge, 0.2 mi (0.3 km) downstream from Sandy Creek, and 2.5 (4.0 km) southwest of Ganado.

DRAINAGE AREA.--1,062 mi<sup>2</sup> (2,751 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1939 to current year.

REVISED RECORDS.--WDR TX-73-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 13.62 ft (4.151 m) above mean sea level (levels by Corps of Engineers). Prior to May 7, 1958, nonrecording gage at site 70 ft (21 m) downstream at same datum. Mar. 7, 1958, to Mar. 22, 1961, nonrecording gages at same site and datum.

REMARKS.--Water-discharge records good. Numerous diversions for irrigation above station. Much of low flow during the April to September irrigation season comes from Sandy Creek; see station 08164495 for discharge measurements during the current year. This low flow is drainage from ricefields irrigated by water originally diverted from the Colorado River.

AVERAGE DISCHARGE.--38 years, 559 ft<sup>3</sup>/s (15.83 m<sup>3</sup>/s), 405,000 acre-ft/yr (499 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 88,000 ft<sup>3</sup>/s (2,490 m<sup>3</sup>/s) June 15, 1973, gage height, 39.8 ft (12.13 m); no flow at times in 1955-56, 1967.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1876, 39.8 ft (12.13 m) May 27, 1936, and June 15, 1973, from information by local resident, Texas and New Orleans Railroad Co., and Texas Highway Department. Discharge, 94,000 ft<sup>3</sup>/s (2,660 m<sup>3</sup>/s) May 27, 1936, from rating curve extended above 57,000 ft<sup>3</sup>/s (1,610 m<sup>3</sup>/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 5,500 ft<sup>3</sup>/s (156 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Dec. 7	2400	9,160 259	25.37 7.733	Feb. 12	1300	8,200 232	24.53 7.477
Dec. 13	0200	7,560 214	23.87 7.276	Apr. 24	0400	*9,560 271	25.71 7.836
Dec. 15	2400	9,020 255	25.25 7.696	June 16	1000	7,360 208	23.53 7.172
Dec. 21	1000	7,360 208	23.53 7.172				

Minimum discharge, 35 ft<sup>3</sup>/s (0.99 m<sup>3</sup>/s) Aug. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	636	3620	214	298	1030	144	107	301	120	126	75	76
2	472	1160	177	278	617	138	105	363	128	133	59	74
3	348	591	151	338	785	136	103	377	129	133	49	67
4	262	408	132	410	3030	137	113	293	120	135	53	61
5	284	296	125	350	1840	152	111	254	115	129	59	57
6	464	230	3600	301	692	165	97	228	113	167	59	52
7	507	190	8310	336	438	146	84	211	108	216	53	53
8	457	163	8470	341	319	132	77	198	104	248	49	227
9	362	143	7930	284	259	125	76	194	108	308	45	302
10	270	125	6220	300	862	122	76	190	104	332	53	277
11	198	146	2680	286	5520	121	76	180	102	305	47	238
12	166	125	6700	234	7990	120	78	224	227	247	45	182
13	151	117	7450	221	7330	122	82	221	257	245	41	178
14	148	125	6370	1420	5950	118	148	196	351	227	39	254
15	137	113	8150	1670	1210	114	189	186	2890	216	42	244
16	229	105	8150	1020	649	110	483	168	7210	208	52	229
17	1090	101	4240	605	472	110	3670	156	5480	214	50	201
18	1470	98	1620	388	370	108	4490	156	2860	290	47	182
19	410	349	1320	290	308	105	3490	155	1210	290	43	174
20	273	1210	4740	238	267	102	2150	148	601	260	39	148
21	402	1230	7060	209	235	99	6800	162	343	246	39	134
22	348	675	4030	195	213	96	8100	228	217	215	46	139
23	178	378	1370	233	199	94	8000	290	154	186	42	137
24	138	255	979	449	186	94	8770	261	136	144	39	127
25	536	196	856	404	184	101	1560	289	136	117	43	116
26	1900	174	1470	316	172	100	533	228	146	100	61	107
27	1050	168	1120	242	160	108	420	157	143	81	51	100
28	466	220	737	210	152	114	347	139	130	82	47	114
29	910	309	555	189	---	118	300	128	126	85	42	132
30	3170	279	440	168	---	136	279	124	122	98	61	137
31	3930	---	355	171	---	128	---	122	---	91	68	---
TOTAL	21362	13299	105721	12394	41439	3715	50914	6527	23990	5874	1538	4519
MEAN	689	443	3410	400	1480	120	1697	211	800	189	49.6	151
MAX	3930	3620	8470	1670	7990	165	8770	377	7210	332	75	302
MIN	137	98	125	168	152	94	76	122	102	81	39	52
AC-FT	42370	26380	209700	24580	82190	7370	101000	12950	47580	11650	3050	8960
CAL YR 1976	TOTAL	237060	MEAN 648	MAX 8470	MIN 17	AC-FT 470200						
WTR YR 1977	TOTAL	291292	MEAN 798	MAX 8770	MIN 39	AC-FT 577800						

08164500 NAVIDAD RIVER NEAR GANADO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1959 to current year. Chemical, biochemical, and pesticide analyses: January 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1959 to current year.

WATER TEMPERATURES: October 1959 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,350 micromhos Oct. 26, 28, 1963; minimum daily, 44 micromhos Mar. 24, 25, 1973.

WATER TEMPERATURES (1959-73): Maximum daily, 37.0°C July 21, 27, 28, 1962, Aug. 19, 1969; minimum daily, 0.0°C Jan. 9-11, 1962, Feb. 22, 1963.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 809 micromhos Mar. 21, 29; minimum daily, 115 micromhos Dec. 7.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)
OCT 21...	0945	300	318	7.4	13.0	130	50	9.6	94	2.1
NOV 18...	1005	90	723	8.1	10.5	35	15	9.6	89	1.4
DEC 16...	1005	6600	131	7.2	12.0	220	80	9.2	88	2.1
JAN 13...	1145	150	567	8.0	11.5	42	25	10.7	101	1.3
FEB 17...	1015	450	402	7.6	13.0	80	60	9.0	88	1.7
MAR 17...	1020	120	760	7.8	21.5	0	10	8.8	102	1.0
APR 14...	0925	100	770	7.8	20.5	5	20	8.0	91	3.4
MAY 12...	1035	240	582	7.4	22.0	30	55	8.3	98	5.1
JUN 09...	0930	90	781	7.7	27.0	10	20	7.8	99	1.6
JUL 14...	0945	270	538	7.6	28.0	40	25	7.4	95	1.1
AUG 18...	0920	55	652	7.3	27.0	55	20	7.0	89	1.3
SEP 15...	1015	350	508	7.3	25.5	220	45	6.8	85	3.3

DATE	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	FECAL STREPTOCOCCI (COL. PER 100 ML)	HARDNESS (CA, MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE-SILICUM (K) (MG/L)
OCT 21...	3900	1100	1300	88	0	28	4.4	29	1.3	5.8
NOV 18...	420	60	200	270	16	100	5.5	52	1.4	4.3
DEC 16...	34000	1900	17000	49	2	17	1.6	7.5	.5	3.4
JAN 13...	380	80	7000	220	23	82	4.5	37	1.1	2.9
FEB 17...	1100	180	380	150	7	55	3.7	25	.9	3.5
MAR 17...	220	44	56	--	--	--	--	--	--	--
APR 14...	2200	210	690	300	27	110	6.3	64	1.6	3.2
MAY 12...	19000	5000	3500	--	--	--	--	--	--	--
JUN 09...	2200	210	100	260	2	94	7.2	70	1.9	2.6
JUL 14...	4300	960	1100	--	--	--	--	--	--	--
AUG 18...	2900	1000	1300	210	0	69	8.6	50	1.5	5.9
SEP 15...	6700	920	2100	140	0	35	13	48	1.8	7.2

## LAVACA RIVER BASIN

08164500 NAVIDAD RIVER NEAR GANADO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	BICARBONATE (HCO <sub>3</sub> ) (MG/L)	CARBONATE (CO <sub>3</sub> ) (MG/L)	DISSOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)
OCT 21...	108	0	12	39	.3	18	182	190	46	13
NOV 18...	312	0	20	73	.3	23	452	432	26	4
DEC 16...	57	0	5.4	10	.1	7.9	98	81	136	18
JAN 13...	244	0	19	56	.3	17	342	339	48	10
FEB 17...	178	0	16	35	.2	14	265	240	154	18
MAR 17...	--	--	--	--	--	--	--	--	34	9
APR 14...	334	0	19	91	.3	24	488	483	58	12
MAY 12...	--	--	--	--	--	--	--	--	123	16
JUN 09...	320	0	25	85	.5	23	455	465	41	4
JUL 14...	--	--	--	--	--	--	--	--	62	6
AUG 18...	260	0	17	76	.4	27	383	382	36	2
SEP 15...	180	0	11	75	.3	42	--	320	134	18

DATE	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT 21...	.08	.00	.03	.97	.09	9.2	70	57	90
NOV 18...	.11	.00	.01	.35	.08	19	22	5.3	94
DEC 16...	.06	.01	.02	.78	.12	14	236	4210	43
JAN 13...	.36	.01	.03	.62	.06	6.2	49	20	83
FEB 17...	.21	.00	.02	.70	.07	7.7	123	149	88
MAR 17...	.19	.00	.04	.52	.04	5.7	82	27	71
APR 14...	.67	.02	.05	.69	.11	8.2	208	56	96
MAY 12...	.56	.15	.48	1.1	.13	9.4	160	104	65
JUN 09...	.07	.00	.01	.56	.06	6.5	68	17	87
JUL 14...	.03	.00	.01	.34	.07	6.8	82	60	61
AUG 18...	.02	.01	.00	.67	.11	12	40	5.9	93
SEP 15...	.16	.02	.03	.57	.27	17	178	168	62

08164500 NAVIDAD RIVER NEAR GANADO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)				
DATE	TIME												
FEB 17...	1015	2	2	--	200	0	0	30	2				
APR 14...	0925	5	4	--	400	0	0	<10	0				
JUN 09...	0930	4	2	--	300	<10	0	0	0				
AUG 18...	0920	3	5	400	400	<10	0	10	0				
		TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)			
DATE	TIME												
FEB 17...	0	0	7	3	4200	40	10	3	70				
APR 14...	0	0	0	0	1000	10	4	0	120				
JUN 09...	<50	0	10	1	690	20	<100	1	90				
AUG 18...	<50	1	10	1	370	20	<100	3	100				
		DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)			
DATE	TIME												
FEB 17...	10	.0	.0	0	0	--	0	10	10				
APR 14...	10	.0	.3	0	0	--	0	10	0				
JUN 09...	10	.0	.0	0	0	--	0	0	0				
AUG 18...	0	.1	.0	0	0	<10	0	10	4				
DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)	
FEB 17...	1015	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0	
AUG 18...	0920	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0	
DATE	TIME	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
FEB 17...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.00	.0
AUG 18...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.00	.0
DATE	TIME	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
FEB 17...	.00	.0	.00	.00	.00	.00	.00	0	0	.00	--	--	--
AUG 18...	.00	.0	.00	.00	.00	.00	.00	0	0	.00	.63	.01	.00



## LAVACA RIVER BASIN

08164500 NAVIDAD RIVER NEAR GANADO, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 21,76 0945	NOV 18,76 1005	DEC 16,76 1005	JAN 13,77 1145	FEB 17,77 1015					
TOTAL CELLS/ML	790	620	100	1700	1600					
DIVERSITY: DIVISION	1.8	1.7	0.0	1.3	0.5					
..CLASS	1.8	1.7	0.0	1.4	0.5					
...ORDER	2.0	2.4	0.0	1.5	0.5					
...FAMILY	2.5	2.6	0.9	1.7	0.5					
....GENUS	2.8	2.6	0.9	1.8	0.0					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
...CHARACIACEAE										
....SCHROEDERIA	--	-	--	-	--	-	--	-	--	-
....HYDRODICTYACEAE										
....PEDIASTRUM	--	-	--	-	--	-	--	-	--	-
....MICRACTINIACEAE										
....GOLFKNINIA	--	-	--	-	--	-	*	0	--	-
....MICPACTINIUM	--	-	--	-	--	-	--	-	--	-
....OOCYSTACEAE										
....ANKISTRODESMUS	72	9	--	-	--	-	25	1	--	-
....DICTYOSPHAERIUM	140#	18	12	2	--	-	--	-	--	-
....FRANCEIA	--	-	--	-	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	*	0	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	--	-
....TETRAEDRON	--	-	--	-	--	-	15	1	--	-
....SCENEDESMACEAE										
....ACTINASTRUM	--	-	--	-	--	-	--	-	--	-
....CRUCIGENIA	--	-	--	-	--	-	--	-	--	-
....SCENEDESMUS	72	9	19	3	--	-	40	2	--	-
....TETRADESMUS	--	-	--	-	--	-	20	1	--	-
....TFTRASTRUM	--	-	--	-	--	-	40	2	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CARTERIA	--	-	--	-	--	-	--	-	--	-
....CHLAMYDOMONAS	--	-	160#	25	--	-	100	6	--	-
....CHLOROGONIUM	--	-	--	-	--	-	--	-	43	3
...VOLVOCAEAE										
....GONIUM	--	-	--	-	--	-	--	-	--	-
..ZYGNEATALES										
...DESMIDIACEAE										
....CLOSTERIUM	36	5	--	-	--	-	--	-	--	-
....COSMARIUM	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%  
 \* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

CONTINUED ..

08164500 NAVIDAD RIVER NEAR GANADO, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 21,76 0945		NOV 18,76 1005		DEC 16,76 1005		JAN 13,77 1145		FEB 17,77 1015	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCEAE										
....CYCLOTELLA	--	-	3	1	--	-	--	-	43	3
....MELOSIRA	--	-	--	-	--	-	*	0	--	-
..PENNALES										
...ACHNANTHACEAE										
...COCCONEIS	--	-	--	-	--	-	--	-	--	-
...CYMBELLACEAE										
....AMPHORA	--	-	--	-	--	-	--	-	--	-
....CYMBELLA	--	-	3	1	--	-	--	-	--	-
....RHOPALODIA	--	-	--	-	--	-	--	-	--	-
....DIATOMACEAE										
....DIATOMA	--	-	--	-	--	-	--	-	--	-
...EUNOTIACEAE										
...EUNOTIA	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE										
...FRAGILARIA	36	5	3	1	--	-	35	2	--	-
...SYNEDRA	--	-	--	-	33#	33	*	0	--	-
...GOMPHONEMACEAE										
...GOMPHONEMA	--	-	--	-	--	-	*	0	--	-
...NAVICULACEAE										
....GYROSIGMA	--	-	--	-	--	-	--	-	--	-
....NAVICULA	--	-	12	2	--	-	--	-	--	-
....PINNULARIA	--	-	--	-	--	-	--	-	--	-
...NITZSCHACEAE										
...NITZSCHIA	210#	27	47	8	67#	67	85	5	--	-
...SURIPELLACEAE										
...SURIPELLA	--	-	--	-	--	-	--	-	43	3
..CHRYSOPHYCEAE										
...CHRYSOMONADALES										
...MALLOMONADACEAE										
...MALLOMONAS	--	-	--	-	--	-	--	-	--	-
...OCHROMONADACEAE										
...OCHROMONAS	--	-	--	-	--	-	*	0	--	-
...SYNURACEAE										
...SYNJURA	--	-	--	-	--	-	25	1	--	-
..XANTHOPHYCEAE										
...HETEROCOCCALES										
...CENTRITRACTACEAE										
...CENTRITRACTUS	--	-	--	-	--	-	--	-	--	-
..BACILLARIOPHYCEAE										
..PENNALES										
...NAVICULACEAE										
....PLAGIOTROPIS	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCOCCALES										
...CHROCOCCOCCAEAE										
....AGMENELLUM	--	-	--	-	--	-	--	-	--	-
....ANACYSTIS	--	-	100#	16	--	-	--	-	--	-
...HORMOGONALES										
...NOSTOCACEAE										
....ANARAENA	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE	--	-	--	-	--	-	--	-	1500#	92
....LYNGBYA	--	-	210#	33	--	-	--	-	--	-
...OSCILLATORIA	140#	18	--	-	--	-	1200#	72	--	-
...PIVUIARIACEAE										
....RAPHIIDOPSIS	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
...CRYPTOMONODACEAE										
....CRYPTOMONAS	--	-	47	8	--	-	45	3	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
...EUGLENA	36	5	6	1	--	-	--	-	--	-
...PHACIUS	--	-	--	-	--	-	--	-	--	-
...TRACHELOMONAS	36	5	3	1	--	-	30	2	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...PERIDINIALES										
...GLENODINIACEAE										
....GLENODINIUM	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## LAVACA RIVER BASIN

08164500 NAVIDAD RIVER NEAR GANADO, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	MAY 12,77 1035	JUN 9,77 0930	JUL 14,77 0945	AUG 18,77 0920	SEP 15,77 1015
TOTAL CELLS/ML	110000	21000	8100	6600	1300
DIVERSITY: DIVISION	0.7	1.4	1.4	1.2	1.8
..CLASS	0.7	1.4	1.5	1.2	1.8
..ORDER	1.2	2.1	2.3	1.6	2.2
...FAMILY	1.4	3.0	2.5	2.4	3.5
....GENUS	1.4	3.3	3.2	2.4	3.7

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....CHARACIACEAE										
....SCHROEDERIA	* 0	--	-		* 0		290	4	47	4
....HYDRODICTYACEAE										
....PEDIASTRUM	* 0		920	4	--	-	--	-	--	-
....MICRACTINIACEAE										
....GOLFENKINIA	--	-	--	-	* 0		--	-	--	-
....MICRACTINIUM	6300	6	630	3	47	1	--	-	--	-
....OOCYSTACEAE										
....ANKISTRODESMUS	1400	1	--	-	350	4	3100#	47	100	8
....DICTYOSPHAERIUM	* 0		4700#	23	94	1	--	-	--	-
....FRANCEIA	* 0		--	-	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	290	1	* 0		--	-	--	-
....SELENASTRUM	870	1	--	-	--	-	--	-	--	-
....TETRAEDRON	* 0		* 0		47	1	--	-	--	-
....SCENEDESMACEAE										
....ACTINASTRUM	990	1	--	-	--	-	--	-	--	-
....CRUCIGENIA	--	-	690	3	190	2	--	-	--	-
....SCENEDESMUS	* 0		2400	12	570	7	970	15	76	6
....TETRADESMUS	--	-	--	-	--	-	--	-	--	-
....TETRASTRUM	870	1	--	-	94	1	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CARTERIA	--	-	--	-	* 0		390	6	--	-
....CHLAMYDOMONAS	* 0		980	5	71	1	--	-	--	-
....CHLOROGONIUM	--	-	--	-	--	-	--	-	--	-
....VOLVOCAEAE										
....GONIUM	* 0		--	-	--	-	--	-	--	-
..ZYGNEMATALES										
...DESMIDIACEAE										
....CLOSTERIUM	--	-	--	-	--	-	--	-	9	1
....COSMARIUM	--	-	--	-	--	-	97	1	--	-

NOTE: # - DOMINANT ORGANISM: EQUAL TO OR GREATER THAN 15%  
 \* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED: LESS THAN 1/2%

CONTINUED ..

08164500 NAVIDAD RIVER NEAR GANADO, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	MAY 12,77 1035		JUN 9,77 0930		JUL 14,77 0945		AUG 18,77 0920		SEP 15,77 1015	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCAEAE										
....CYCLOTELLA	990	1	630	3	750	9	--	-	38	3
....MELOSIRA	*	0	230	1	--	-	--	-	--	-
..PENNALES										
...ACHNANTHACEAE										
....COCCONEIS	--	-	--	-	--	-	--	-	130	10
...CYMBELLACEAE										
....AMPHORA	--	-	--	-	--	-	97	1	28	2
....CYMBELLA	--	-	*	0	--	-	--	-	--	-
....RHOPALODIA	--	-	--	-	*	0	--	-	--	-
...DIATOMACEAE										
....DIATOMA	--	-	--	-	--	-	--	-	19	1
...EUNOTIACEAE										
....EUNOTIA	--	-	--	-	--	-	--	-	9	1
...FRAGILARIACEAE										
....FRAGILARIA	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	--	-	340	2	--	-	--	-	140	11
...GOMPHONEMACEAE										
....GOMPHONEMA	--	-	--	-	*	0	--	-	--	-
...NAVICULACEAE										
....GYROSIGMA	--	-	--	-	--	-	--	-	19	1
....NAVICULA	--	-	*	0	*	0	--	-	47	4
....PINNULARIA	--	-	--	-	*	0	--	-	--	-
...NITZSCHACEAE										
....NITZSCHIA	1600	1	--	-	310	4	--	-	19	1
...SURIRELLACEAE										
....SURIRELLA	*	0	--	-	--	-	--	-	--	-
CHRYSOPHYCEAE										
..CHRYSOMONADALES										
...MALLOMONADACEAE										
....MALLOMONAS	--	-	*	0	--	-	--	-	--	-
...OCHROMONADACEAE										
....OCHROMONAS	--	-	--	-	--	-	--	-	--	-
...SYNURACEAE										
....SYNJURA	--	-	--	-	--	-	--	-	--	-
..XANTHOPHYCEAE										
...HETEROCOCCALES										
...CENTRITRACTACEAE										
....CENTRITRACTUS	--	-	--	-	*	0	--	-	--	-
..BACILLARIOPHYCEAE										
..PENNALES										
...NAVICULACEAE										
....PLAGIOTROPIS	--	-	--	-	*	0	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCALES										
....CHROCOCCACEAE										
....AGMENELLUM	12000	11	4600#	22	1800#	22	--	-	--	-
....ANACYSTIS	--	-	--	-	420	5	780	12	57	4
...HORMOGONALES										
...NOSTOCACEAE										
....ANARAENA	--	-	--	-	*	0	--	-	150	12
...OSCILLATORIACEAE										
....LYNGBYA	--	-	2900	14	640	8	--	-	--	-
....OSCILLATORIA	83000#	76	--	-	2300#	29	97	1	290#	23
...RIVULARIACEAE										
....RAPHIIDIOPSIS	--	-	750	4	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
....CRYPTOMONADACEAE										
....CRYPTOMONAS	*	0	--	-	120	1	--	-	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
....EUGLENACEAE										
....EUGLENA	*	0	--	-	*	0	--	-	47	4
....PHACUS	--	-	--	-	--	-	--	-	19	1
....TRACHELOMONAS	--	-	570	3	*	0	780	12	38	3
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...PERIDINIALES										
...GLENODINIACEAE										
....GLENODINIUM	--	-	--	-	71	1	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM; MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## LAVACA RIVER BASIN

08164500 NAVIDAD RIVER NEAR GANADO, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	21362	292	170	10100	32	1830	11	652	95
NOV. 1976.....	13299	304	180	6500	33	1200	12	418	100
DEC. 1976.....	105721	184	110	31200	18	5080	8	2330	59
JAN. 1977.....	12394	366	220	7320	41	1380	13	448	120
FEB. 1977.....	41439	230	140	15500	24	2630	9	1060	75
MAR. 1977.....	3715	710	430	4260	86	861	23	232	240
APR. 1977.....	50914	188	110	15400	18	2510	8	1150	60
MAY 1977.....	6527	645	380	6780	77	1360	21	373	220
JUNE 1977.....	23990	334	200	12900	37	2420	12	804	110
JULY 1977.....	5874	578	340	5460	69	1090	19	308	190
AUG. 1977.....	1538	685	410	1700	83	343	22	92	230
SEPT 1977.....	4519	561	340	4090	66	811	19	229	190
TOTAL .....	291292	**	**	121000	**	21500	**	8100	**
WTD.AVG. ....	798.06	258	150	**	27	**	10	**	84

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	434	233	373	475	320	641	775	690	634	637	684	643
2	442	184	424	500	350	703	750	666	639	527	568	664
3	465	227	491	460	250	660	740	647	561	520	496	670
4	481	275	510	420	161	606	709	650	646	514	702	685
5	450	325	550	487	180	780	778	654	680	509	714	625
6	410	389	300	435	220	650	775	662	714	531	742	620
7	387	440	115	431	255	630	706	675	537	522	650	614
8	429	484	159	429	275	703	796	689	739	512	567	575
9	433	543	165	500	459	751	699	702	776	518	700	539
10	438	600	186	533	219	769	640	720	614	522	749	537
11	440	676	325	473	174	696	589	735	625	527	723	539
12	460	665	200	550	150	685	752	672	515	557	747	537
13	475	700	148	560	180	673	651	636	467	554	742	535
14	534	630	175	200	212	664	647	675	526	560	745	525
15	550	612	139	162	412	626	649	710	220	565	740	531
16	500	665	140	210	400	567	420	747	130	573	665	544
17	275	689	131	253	465	704	200	601	407	600	735	535
18	234	723	300	306	489	664	137	656	425	593	634	531
19	280	550	400	429	540	757	138	682	480	592	597	528
20	350	190	225	473	590	783	175	637	502	589	650	544
21	318	200	164	523	649	809	143	625	511	595	710	556
22	360	240	160	550	679	786	133	575	409	600	760	567
23	420	257	200	510	747	683	152	554	502	640	750	559
24	450	295	250	320	775	697	140	505	552	675	753	565
25	380	400	300	336	800	718	284	629	542	720	760	571
26	200	510	220	379	726	765	532	560	580	737	669	590
27	238	530	260	648	763	800	541	505	617	720	680	595
28	410	475	262	646	800	795	689	565	605	737	685	584
29	350	456	317	640	---	809	675	625	639	697	667	614
30	210	388	380	650	---	738	670	670	535	651	661	611
31	183	---	435	643	---	800	---	735	---	667	671	---
MEAN	387	452	271	456	437	713	523	647	544	596	688	578

## LAVACA RIVER BASIN

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08164500 NAVIDAD RIVER NEAR GANADO, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.5	14.5	5.0	---	8.0	16.5	---	---	25.5	28.0	27.0	26.5
2	21.5	15.0	9.5	---	---	17.0	---	24.0	24.5	28.0	27.0	26.5
3	---	14.5	8.5	---	10.0	---	---	24.0	24.5	---	27.0	26.5
4	22.0	14.5	---	---	11.0	15.0	18.0	23.5	24.5	---	26.5	---
5	---	14.0	---	8.5	---	14.5	16.5	23.5	---	27.0	27.0	---
6	---	14.0	---	8.5	---	---	17.0	23.0	25.0	28.0	26.5	26.5
7	19.0	---	14.0	9.5	11.5	13.5	17.0	---	26.5	27.0	---	26.5
8	18.5	15.5	11.5	10.0	11.5	14.0	18.0	---	26.0	27.0	26.5	25.5
9	---	15.5	13.0	---	11.0	15.0	18.5	---	25.5	27.0	26.5	26.5
10	---	---	14.0	9.5	13.0	15.0	---	---	25.5	---	26.5	---
11	17.0	16.5	---	5.5	15.0	15.5	19.5	22.0	---	27.0	26.5	---
12	18.5	16.0	---	8.0	---	---	20.0	21.5	---	27.0	26.5	26.5
13	19.0	---	11.0	---	---	---	20.5	23.5	26.5	27.0	26.5	26.5
14	19.5	---	---	9.5	14.5	16.0	20.5	---	27.0	---	---	---
15	---	8.5	12.0	10.0	14.0	18.0	20.5	---	---	27.0	26.5	26.5
16	---	9.0	13.0	---	13.0	19.5	---	24.0	25.0	27.0	26.5	26.5
17	---	9.5	13.0	7.0	12.0	20.5	---	24.0	25.5	---	26.5	---
18	16.5	---	---	6.0	14.0	20.5	21.0	23.5	---	27.0	26.5	---
19	---	---	---	4.5	---	21.5	21.0	24.0	---	27.0	26.5	26.5
20	---	---	---	5.0	---	---	---	24.0	26.5	27.0	---	26.5
21	---	---	10.0	7.0	16.0	18.5	21.5	---	27.0	26.5	---	26.0
22	---	13.5	10.0	---	16.5	16.0	21.0	---	28.0	26.0	26.5	26.5
23	---	12.0	---	---	16.5	15.5	21.0	23.5	28.0	---	26.5	26.5
24	---	13.5	---	---	---	17.0	---	24.0	26.5	---	27.0	---
25	---	---	---	10.5	17.0	18.0	20.5	24.0	27.0	27.0	28.0	---
26	---	---	---	11.0	18.0	---	20.0	24.0	---	27.0	27.0	26.5
27	18.0	---	11.0	11.0	---	---	20.0	24.0	27.0	28.0	---	26.5
28	---	---	11.0	10.5	16.5	18.5	20.5	---	27.0	27.0	---	26.5
29	---	6.5	10.5	---	---	19.0	---	---	27.0	27.0	26.5	26.5
30	14.0	6.0	12.0	---	---	20.0	---	---	27.0	27.0	26.5	26.5
31	14.0	---	---	9.0	---	19.0	---	25.0	---	---	26.5	---
MEAN	18.5	12.5	11.0	8.5	13.5	17.0	19.5	23.5	26.0	27.0	26.5	26.5



## LAVACA RIVER BASIN

08164505 MUSTANG CREEK BELOW GANADO, TX  
(Reconnaissance partial-record station)

LOCATION.--Lat 28°59'33", long 96°32'06", Jackson County, Hydrologic Unit 12100102, at bridge on Farm Road 2982 and 3.5 mi (5.6 km) south of Ganado.

DRAINAGE AREA.--290 mi<sup>2</sup> (751 km<sup>2</sup>).

PERIOD OF RECORD.--Periodic discharge measurements: October 1975 to current year. Periodic water-quality data: October 1975 to September 1977 (discontinued).

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA, MG)
OCT 21...	1130	91	392	7.6	14.5	40	10.0	101	2.4	120
NOV 24...	1500	110	207	7.3	15.0	120	9.7	99	3.4	65
JAN 11...	0915	27	207	7.7	5.0	90	10.8	87	2.0	62
FEB 22...	1510	6.4	270	6.7	18.0	110	7.9	86	3.5	77
MAR 31...	1145	8.7	813	7.3	20.5	35	6.2	70	5.1	260
MAY 16...	1350	43	1090	8.1	27.0	25	9.3	118	4.0	290
JUN 23...	1655	47	343	7.5	29.5	30	7.6	100	2.0	110
AUG 03...	1345	53	707	8.0	32.5	20	7.8	107	2.2	210
SEP 15...	1540	560	385	7.4	28.0	110	5.6	72	3.4	120

DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT 21...	30	34	7.8	29	1.2	7.0	106	0	14	59
NOV 24...	11	19	4.2	16	.9	6.4	65	0	15	22
JAN 11...	2	19	3.6	17	.9	4.6	74	0	10	21
FEB 22...	0	23	4.7	23	1.1	5.3	94	0	12	30
MAR 31...	120	78	15	60	1.6	9.0	168	0	37	150
MAY 16...	140	89	16	100	2.6	5.9	184	0	43	220
JUN 23...	16	35	6.5	24	1.0	2.8	120	0	11	42
AUG 03...	47	63	13	64	1.9	3.6	200	0	17	120
SEP 15...	19	35	7.2	29	1.2	6.9	120	0	8.8	51

DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 21...	.3	27	230	64	.12	.01	.04	.92	.14	7.8
NOV 24...	.3	15	130	180	.19	.01	.05	1.3	.18	13
JAN 11...	.1	11	123	184	.59	.02	.14	1.4	.27	11
FEB 22...	.2	11	156	224	.39	.01	.06	1.2	.32	10
MAR 31...	.3	21	453	70	.74	.17	.71	1.3	.35	--
MAY 16...	.4	19	584	44	.92	.08	.14	.84	.31	8.9
JUN 23...	.2	23	204	68	.17	.01	.03	.65	.12	10
AUG 03...	.4	25	405	37	.01	.01	.00	.98	.10	5.0
SEP 15...	.2	35	232	240	.32	.02	.06	1.4	.30	13

## LAVACA RIVER BASIN

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08164505 MUSTANG CREEK BELOW GANADO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

				DIS-SOLVED ARSENIC (AS) (UG/L)		DIS-SOLVED BARIUM (BA) (UG/L)		DIS-SOLVED CADMIUM (CD) (UG/L)		DIS-SOLVED CHROMIUM (CR) (UG/L)		DIS-SOLVED COPPER (CU) (UG/L)		DIS-SOLVED IRON (FE) (UG/L)	
		DATE	TIME												
		NOV 24...	1500			2		0		0		4		140	
		MAR 31...	1145			4		200		0		2		20	
		AUG 03...	1345			4		300		0		1		30	
		DATE		DIS-SOLVED LEAD (PB) (UG/L)		DIS-SOLVED MANGANESE (MN) (UG/L)		DIS-SOLVED MERCURY (HG) (UG/L)		DIS-SOLVED SELENIUM (SE) (UG/L)		DIS-SOLVED SILVER (AG) (UG/L)		DIS-SOLVED ZINC (ZN) (UG/L)	
		NOV 24...		2		5		.0		0		0		5	
		MAR 31...		0		20		.0		1		0		0	
		AUG 03...		0		10		.0		0		0		6	
DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MATERIAL (UG/KG)	POLY-CHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL CHLORDANE (UG/L)	CHLORDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDT (UG/L)	DDT IN BOTTOM MATERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MATERIAL (UG/KG)			
NOV 24...	1500	.0	--	.00	.00	--	.0	--	.00	--	.00	--			
MAR 31...	1145	.0	--	.00	.00	--	.0	--	.00	--	.00	--			
AUG 03...	1345	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.3			
DATE		TOTAL DDT (UG/L)	DDT IN BOTTOM MATERIAL (UG/KG)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	DIELDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	HEPTACHLOR IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	HEPTACHLOR EPOXIDE IN BOTTOM MATERIAL (UG/KG)		
NOV 24...		.00	--	.00	.00	--	.00	--	.00	.00	--	.00	--		
MAR 31...		.00	--	.00	.00	--	.00	--	.00	.00	--	.00	--		
AUG 03...		.00	.0	.00	.00	.1	.00	.0	.00	.00	.0	.00	.0		
DATE		TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOXAPHENE IN BOTTOM MATERIAL (UG/KG)	TOTAL TRIETHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)		
NOV 24...		.00	--	.00	.00	.00	.00	0	--	.00	.00	.00	.00		
MAR 31...		.00	--	.00	.00	.00	.00	0	--	.00	.00	.00	.00		
AUG 03...		.00	.0	.00	.00	.00	.00	0	0	.00	.13	.12	.00		

## GARCITAS CREEK BASIN

08164600 GARCITAS CREEK NEAR INEZ, TX

LOCATION.--Lat 28°53'28", long 96°49'08", Victoria County, Hydrologic Unit 12100402, at right downstream end of bridge on U.S. Highway 59 access road, 0.3 mi (0.5 km) upstream from Southern Pacific Railroad bridge, 2.0 mi (3.2 km) southwest of Inez, and 3.6 mi (5.8 km) upstream from Casa Blanca Creek.

DRAINAGE AREA.--91.7 mi<sup>2</sup> (238 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1970 to current year.

GAGE.--Water-stage recorder. Datum of gage is 29.16 ft (8.888 m) above mean sea level.

REMARKS.--Water-discharge records good. No known diversion above station. An undetermined amount of return water from irrigation enters stream above station. Recording rain gage at station.

AVERAGE DISCHARGE.--7 year (water years 1971-77), 47.9 ft<sup>3</sup>/s (1.357 m<sup>3</sup>/s), 7.09 in/yr (180 mm/yr), 34,700 acre-ft/yr (42.8 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,980 ft<sup>3</sup>/s (169 m<sup>3</sup>/s) Dec. 25, 1975, gage height, 20.84 ft (6.352 m); no flow May 22, 23, May 26 to June 17, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1903, 24.5 ft (7.47 m) Oct. 26, 1960. In 1929, a flood nearly as high as the 1960 flood occurred, and a flood in September 1967 reached a stage of 23.4 ft (7.13 m), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft<sup>3</sup>/s (11.3 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)	Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)
Oct. 16	2200	455	12.9	10.35	3.155	Dec. 13	0800	1,140	32.3	13.24	4.036
Oct. 30	0700	1,450	41.1	14.11	4.301	Dec. 15	0300	1,090	30.9	13.06	3.981
Nov. 20	0500	799	22.6	11.98	3.652	Dec. 20	1300	841	23.8	12.15	3.703
Dec. 6	2200	1,230	34.8	13.51	4.118	Feb. 11	0600	1,230	34.8	13.50	4.115
Dec. 11	2100	938	26.6	12.52	3.816	June 15	1900	*3,820	108	18.47	5.630

Minimum discharge, 1.0 ft<sup>3</sup>/s (0.028 m<sup>3</sup>/s) June 10, 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	111	59	24	15	9.4	5.7	6.2	4.2	5.9	2.3	3.2
2	36	66	42	24	16	9.4	6.0	5.9	5.2	5.5	2.2	2.4
3	25	44	33	28	132	9.5	6.0	5.8	2.5	5.0	2.2	2.2
4	18	34	26	31	176	9.9	6.5	5.5	2.3	4.8	2.2	2.0
5	231	26	34	29	77	10	9.7	5.5	2.1	4.8	2.9	2.0
6	213	22	736	26	44	9.3	7.2	5.3	1.9	4.6	4.3	2.0
7	77	18	759	38	30	8.8	4.7	4.9	1.9	4.4	4.5	2.0
8	46	16	194	35	22	8.6	4.9	4.6	1.7	4.4	3.9	7.6
9	35	14	103	28	18	8.6	4.6	5.1	1.5	5.7	3.8	5.5
10	25	13	68	24	312	8.6	3.8	5.0	1.3	5.9	3.8	3.0
11	19	12	463	20	1110	8.9	3.7	4.3	2.1	6.1	5.1	2.6
12	15	11	723	18	574	8.8	3.5	4.1	40	5.7	4.2	2.2
13	12	12	984	28	178	8.3	11	3.8	29	6.6	3.8	5.9
14	9.4	20	606	130	90	7.8	6.2	3.5	17	8.6	6.9	21
15	9.2	27	820	100	55	7.8	5.9	3.6	2140	8.3	3.8	9.4
16	232	20	262	55	38	7.7	20	3.7	1720	7.3	2.4	7.9
17	243	16	141	35	29	7.5	29	3.5	419	7.6	2.1	7.6
18	86	14	92	26	23	7.5	21	3.5	155	4.8	2.0	6.9
19	49	262	113	20	20	7.1	13	3.5	75	3.9	2.5	5.6
20	56	649	682	17	18	6.2	99	3.5	42	3.4	2.3	4.1
21	50	233	288	15	15	5.9	192	8.6	29	2.7	1.9	5.2
22	34	109	118	17	14	5.6	83	7.8	22	2.6	1.8	5.5
23	25	63	84	116	14	5.2	38	10	17	2.6	1.7	4.8
24	26	43	72	166	12	5.9	23	8.0	15	2.6	1.7	5.3
25	252	34	84	82	12	7.5	15	6.0	15	2.6	1.7	6.5
26	181	37	260	48	11	7.5	11	4.5	12	2.6	1.9	9.0
27	81	54	132	34	10	7.1	8.7	3.9	10	2.7	2.2	7.5
28	60	53	75	27	9.4	7.8	7.0	3.5	8.9	3.0	2.8	3.9
29	565	116	49	20	---	7.7	5.9	3.1	7.5	3.0	4.0	2.3
30	1130	97	37	17	---	7.0	6.1	2.8	6.6	2.6	2.9	1.6
31	243	---	29	16	---	6.2	---	2.4	---	2.6	2.9	---
TOTAL	4143.6	2246	8168	1294	3074.4	243.1	661.1	151.4	4806.7	142.9	92.7	156.7
MEAN	134	74.9	263	41.7	110	7.84	22.0	4.88	160	4.61	2.99	5.22
MAX	1130	649	984	166	1110	10	192	10	2140	8.6	6.9	21
MIN	9.2	11	26	15	9.4	5.2	3.5	2.4	1.3	2.6	1.7	1.6
CFSM	1.46	.82	2.87	.46	1.20	.09	.24	.05	1.75	.05	.03	.06
IN.	1.68	.91	3.31	.52	1.25	.10	.27	.06	1.95	.06	.04	.06
AC-FT	8220	4450	16200	2570	6100	482	1310	300	9530	283	184	311

CAL YR 1976	TOTAL	26512.39	MEAN 72.4	MAX 1410	MIN .39	CFSM .79	IN 10.76	AC-FT 52590
WTR YR 1977	TOTAL	25180.60	MEAN 69.0	MAX 2140	MIN 1.3	CFSM .75	IN 10.21	AC-FT 49950

## GARCITAS CREEK BASIN

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08164600 GARCITAS CREEK NEAR INEZ, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1969 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	HARD- NESS (CA, MG) (MG/L)
OCT										
15...	1130	6.9	382	7.5	22.0	35	8.5	100	1.5	150
NOV										
19...	1145	120	189	7.3	13.0	120	10.2	100	2.6	70
JAN										
11...	1330	19	361	7.8	8.5	30	10.0	88	1.2	140
FEB										
23...	0940	13	543	7.1	18.0	15	8.8	96	1.0	220
APR										
01...	0855	5.9	741	7.6	17.0	2	8.6	91	1.0	300
MAY										
17...	1015	3.6	720	7.8	25.5	5	8.6	108	1.9	290
JUN										
24...	0940	14	475	7.5	27.5	10	7.0	90	1.1	190
AUG										
05...	0950	2.3	629	7.8	29.0	2	6.8	89	1.8	250
SEP										
16...	1025	8.0	587	7.7	28.0	15	7.8	100	1.5	180

DATE	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
OCT										
15...	8	50	6.3	22	.8	2.3	174	0	17	28
NOV										
19...	8	23	3.1	12	.6	2.4	76	0	10	13
JAN										
11...	15	46	6.0	22	.8	2.2	152	0	18	29
FEB										
23...	22	73	9.2	30	.9	2.0	242	0	31	41
APR										
01...	38	98	13	52	1.3	1.6	317	0	41	68
MAY										
17...	37	97	12	46	1.2	1.5	310	0	49	62
JUN										
24...	27	64	7.6	27	.9	2.2	200	0	23	35
AUG										
05...	39	81	12	56	1.5	1.6	260	0	56	70
SEP										
16...	0	57	9.6	56	1.8	3.0	230	0	20	70

DATE	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT										
15...	.2	24	236	50	.01	.00	.03	.64	.03	6.8
NOV										
19...	.2	11	112	262	.03	.01	.03	.86	.06	12
JAN										
11...	.3	20	218	265	.06	.00	.04	.59	.02	8.1
FEB										
23...	.2	24	330	35	.02	.00	.01	.45	.03	5.8
APR										
01...	.3	31	461	2	.01	.00	.01	.31	.01	--
MAY										
17...	.4	29	450	6	.03	.00	.01	.37	.02	4.4
JUN										
24...	.2	28	286	19	.01	.00	.03	.33	.06	11
AUG										
05...	.3	35	440	2	.00	.01	.00	.35	.01	3.5
SEP										
16...	.4	34	363	23	.05	.01	.00	.34	.02	5.6

## GARCITAS CREEK BASIN

08164600 GARCITAS CREEK NEAR INEZ, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV 19...	1145	2	100	0	0	3	160
APR 01...	0855	3	200	0	3	0	20
AUG 05...	0950	2	400	0	0	1	30

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV 19...	12	10	.0	0	0	20
APR 01...	0	40	.0	0	0	10
AUG 05...	0	60	.0	2	0	0

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDF IN BOTTOM MA- TERIAL (UG/KG)
NOV 19...	1145	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0
AUG 05...	0950	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
NOV 19...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
AUG 05...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 19...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
AUG 05...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00

## PLACEDO CREEK BASIN

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08164800 PLACEDO CREEK NEAR PLACEDO, TX

LOCATION.--Lat 28°43'30", long 96°46'07", Victoria County, Hydrologic Unit 12100401, on right bank at downstream end of bridge on Farm Road 616, 0.1 mi (0.2 km) downstream from confluence of Lone Tree Creek and Arroyo Palo Alto, 1.2 mi (1.9 km) upstream from Ninemile Creek, and 4.4 mi (7.1 km) northeast of Placedo.

DRAINAGE AREA.--68.3 mi<sup>2</sup> (177 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1970 to current year.

GAGE.--Water-stage recorder. Datum of gage is 5.58 ft (1.701 m) above mean sea level.

REMARKS.--Water-discharge records good. No known diversion above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--7 years, 57.6 ft<sup>3</sup>/s (1.631 m<sup>3</sup>/s), 41,730 acre-ft/yr (51.5 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,250 ft<sup>3</sup>/s (234 m<sup>3</sup>/s) June 13, 1973, gage height, 25.96 ft (7.913 m); no flow Sept. 8, 9, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1930, 31.9 ft (9.72 m) in September 1967 and 30.4 ft (9.27 m) in 1960 (probably October), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Nov. 19	2200	1,800 51.0	19.04 5.803	Apr. 20	2100	3,610 102	21.71 6.617
Dec. 12	1900	1,270 36.0	17.75 5.410	May 22	0600	1,260 35.7	17.70 5.395
Feb. 11	0200	1,070 30.3	17.10 5.212	June 15	2100	*6,620 187	24.71 7.532

Minimum discharge, 0.35 ft<sup>3</sup>/s (0.010 m<sup>3</sup>/s) Aug. 5, 25-28, Sept. 12, 13, 19, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	48	32	7.2	3.4	1.8	.94	3.3	14	3.3	.60	1.1
2	5.1	22	19	39	3.8	1.9	1.1	6.3	11	2.6	.55	1.4
3	2.5	11	12	139	26	2.2	1.0	5.3	3.6	2.2	.61	1.1
4	1.6	7.5	8.4	64	62	2.3	.88	2.4	1.5	2.1	.53	.75
5	44	5.4	7.8	28	23	2.1	.78	1.6	.98	2.0	.44	.50
6	118	4.2	236	18	10	2.1	.69	1.3	.94	2.1	.73	.46
7	44	3.4	258	18	6.0	2.1	.82	1.2	.88	6.8	.97	.56
8	20	3.1	76	15	4.2	2.1	.93	1.2	.77	3.3	.58	.41
9	9.8	3.0	33	10	3.4	2.2	.82	1.4	.78	2.2	.45	.68
10	7.5	3.1	18	7.0	270	2.2	1.4	1.4	.82	2.2	.44	3.3
11	4.8	3.0	375	5.8	783	2.2	1.8	1.2	1.0	2.1	.47	1.2
12	3.5	3.3	989	4.9	207	2.3	.96	1.2	179	2.1	.50	.48
13	2.7	4.3	745	6.6	67	2.2	.88	1.1	154	2.0	.46	9.1
14	2.0	3.9	456	99	25	2.2	1.2	.98	46	2.0	.48	42
15	1.9	3.5	377	72	11	2.3	1.2	1.0	3520	2.0	.45	35
16	396	3.3	114	28	6.2	2.2	3.9	1.0	5490	2.0	.47	7.0
17	187	3.3	52	13	4.2	2.1	16	.98	1990	2.3	.49	2.4
18	52	3.8	28	7.9	3.2	1.9	10	.94	217	2.4	.40	1.5
19	25	775	108	5.4	2.7	1.6	2.2	.91	55	2.3	.43	1.1
20	65	1050	596	4.5	2.6	1.5	1370	.89	18	2.6	.48	1.6
21	47	210	142	3.9	2.4	1.4	1610	175	7.7	2.3	.49	1.9
22	19	70	50	4.6	2.2	1.7	120	872	5.3	2.1	.45	2.0
23	10	38	31	36	2.2	1.5	29	125	4.5	1.4	.41	1.5
24	7.2	16	26	68	2.0	1.6	9.4	26	4.2	1.0	.40	1.4
25	31	10	29	30	1.9	1.7	4.3	7.9	4.0	1.0	.39	1.3
26	65	9.2	73	13	2.0	1.3	2.7	3.0	3.8	.96	.39	1.4
27	29	8.0	46	7.9	1.8	1.3	2.2	1.6	3.7	.85	.37	1.4
28	19	68	22	5.3	1.7	1.5	2.2	1.3	3.5	.81	.90	1.4
29	396	145	13	4.0	---	1.0	2.2	1.1	3.2	1.2	1.6	1.3
30	430	69	9.1	3.5	---	.86	2.4	1.0	3.2	1.3	1.1	1.3
31	115	---	7.4	3.4	---	.71	---	.98	---	.75	1.6	---
TOTAL	2174.6	2607.3	4988.7	771.9	1539.9	56.07	3201.90	1250.48	11748.37	64.27	18.63	126.54
MEAN	70.1	86.9	161	24.9	55.0	1.81	107	40.3	392	2.07	.60	4.22
MAX	430	1050	989	139	783	2.3	1610	872	5490	6.8	1.6	42
MIN	1.6	3.0	7.4	3.4	1.7	.71	.69	.89	.77	.75	.37	.41
AC-FT	4310	5170	9900	1530	3050	111	6350	2480	23300	127	37	251
CAL YR 1976	TOTAL	15044.71	MEAN	41.1	MAX	1050	MIN	.14	AC-FT	29840		
WTR YR 1977	TOTAL	28548.66	MEAN	78.2	MAX	5490	MIN	.37	AC-FT	56630		



## PLACEDO CREEK BASIN

08164800 PLACEDO CREEK NEAR PLACEDO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1968 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIO-CHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA+MG) (MG/L)
OCT 19...	1135	20	334	7.3	20.0	130	8.6	98	3.1	81
NOV 23...	1200	31	377	7.4	14.0	100	9.5	95	3.2	85
JAN 05...	1020	30	430	7.1	10.5	140	10.8	100	2.7	88
FEB 17...	1147	4.5	1510	7.2	13.0	65	8.9	87	2.2	320
MAR 30...	1040	.93	4850	7.3	21.0	7	5.3	61	.8	960
MAY 11...	1615	1.1	4510	7.5	25.0	10	6.1	75	2.4	900
JUN 22...	1030	5.4	1220	7.2	29.0	20	5.2	68	1.4	270
AUG 09...	1310	.40	5800	7.5	30.0	7	4.9	65	2.6	980
SEP 14...	1010	29	434	7.6	24.5	370	6.8	83	4.8	88
DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED SILICUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT 19...	18	26	3.8	31	1.5	6.0	76	0	6.1	61
NOV 23...	20	27	4.3	38	1.8	5.2	80	0	7.9	71
JAN 05...	30	28	4.3	48	2.2	4.1	70	0	8.0	93
FEB 17...	160	100	17	190	4.6	4.6	194	0	24	380
MAR 30...	630	300	51	660	9.3	4.0	408	0	65	1400
MAY 11...	580	280	49	600	8.7	4.8	388	0	53	1300
JUN 22...	120	88	13	140	3.7	4.3	190	0	14	290
AUG 09...	710	300	55	850	12	5.6	330	0	47	1800
SEP 14...	12	28	4.3	50	2.3	4.6	92	0	10	79
DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 19...	.3	16	188	218	.01	.01	.04	1.1	.28	8.2
NOV 23...	.2	16	209	164	.02	.01	.02	1.2	.20	13
JAN 05...	.1	14	234	244	.18	.02	.04	1.6	.24	13
FEB 17...	.2	19	830	144	.10	.01	.07	.87	.13	16
MAR 30...	.6	31	2710	14	.04	.01	.10	.52	.06	--
MAY 11...	.6	29	2510	18	.18	.01	.06	.65	.09	6.8
JUN 22...	.3	25	668	37	.00	.01	.06	.60	.13	12
AUG 09...	.6	20	3240	20	.00	.01	.01	.57	.06	5.4
SEP 14...	.3	15	237	876	.35	.02	.06	1.9	.22	17

## PLACEDO CREEK BASIN

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08164800 PLACEDO CREEK NEAR PLACEDO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CAD- MIUM (CD) (UG/L)	DIS-SOLVED CHRO- MIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV 23...	1200	2	200	0	0	3	100
MAR 30...	1040	5	1000	0	2	0	20
AUG 09...	1310	5	1800	0	0	0	20

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN- GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELE- NIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV 23...	0	10	.0	0	0	20
MAR 30...	2	150	.0	0	0	10
AUG 09...	0	160	.0	0	0	20

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
NOV 23...	1200	.0	0	.00	.00	.0	.0	0	.00	.1	.00	.5
MAR 30...	1040	.0	0	.00	.00	.0	.0	1	.00	1.6	.00	1.7
AUG 09...	1310	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
NOV 23...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
MAR 30...	.00	.0	.00	.00	.1	.00	.0	.00	.00	.0	.00	.0
AUG 09...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 23...	.00	.0	.00	.00	.00	.00	0	0	.00	.01	1.4	.00
MAR 30...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
AUG 09...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00

## CHOCOLATE BAYOU BASIN

08164850 CHOCOLATE BAYOU NEAR PORT LAVACA, TX  
(Reconnaissance partial-record station)

LOCATION.--Lat 28°35'40", Long 96°41'48", Calhoun County, Hydrologic Unit 12100402, at bridge on Sweetwater Road, 2.3 mi (3.7 km) upstream from State Highway 35, and 4.5 mi (7.2 km) southwest of Port Lavaca.

DRAINAGE AREA.--53.7 mi<sup>2</sup> (139.1 km<sup>2</sup>).

PERIOD OF RECORD.--Periodic discharge measurements: September 1967 to July 1968, February 1970 to current year. Periodic water-quality data: June 1970 to current year.

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIO-CHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA, MG)
OCT 14...	1520	12	1300	7.4	24.5	15	7.7	94	2.3	160
NOV 23...	0930	69	173	7.1	14.0	80	8.6	86	2.8	50
JAN 04...	1720	38	254	7.1	10.5	160	11.2	104	3.1	70
FEB 16...	1605	7.6	897	7.1	15.0	130	8.6	88	2.8	210
MAR 29...	1615	.54	5690	7.5	24.5	20	13.9	170	7.0	1400
MAY 11...	1335	.91	3160	7.6	26.0	20	9.5	119	6.6	750
JUN 22...	0810	14	488	7.1	29.0	30	5.0	66	2.3	110
AUG 09...	1535	.41	5450	8.3	34.0	9	17.6	248	5.2	1200
SEP 13...	1415	1.0	3040	7.9	33.0	35	9.5	132	3.5	610

DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT 14...	0	44	11	220	7.7	10	276	0	8.3	280
NOV 23...	0	16	2.5	16	1.0	4.8	62	0	8.6	18
JAN 04...	11	22	3.7	24	1.2	4.0	72	0	12	37
FEB 16...	110	62	13	95	2.9	4.9	124	0	49	190
MAR 29...	1100	400	100	720	8.3	4.8	350	0	340	1700
MAY 11...	550	220	49	380	6.0	5.6	240	0	190	820
JUN 22...	14	35	6.0	58	2.4	5.6	120	0	20	86
AUG 09...	980	330	90	730	9.2	5.1	260	0	360	1600
SEP 13...	380	170	44	390	6.9	5.6	270	0	140	780

DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 14...	.4	71	781	36	.02	.01	.08	1.5	.10	13
NOV 23...	.3	19	116	120	.07	.00	.01	.84	.18	13
JAN 04...	.1	16	154	296	.18	.01	.07	1.3	.23	17
FEB 16...	.2	20	495	256	.23	.02	.15	1.1	.20	13
MAR 29...	.6	23	3460	43	.30	.02	.38	1.2	.43	--
MAY 11...	.5	19	1800	28	1.1	.05	.16	1.3	.19	6.3
JUN 22...	.2	34	304	74	.01	.00	.05	.95	.16	38
AUG 09...	.7	20	3270	28	.11	.03	.01	.82	.26	6.6
SEP 13...	.7	26	1690	87	.22	.05	.29	.64	.29	11

## CHOCOLATE BAYOU BASIN

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08164850 CHOCOLATE BAYOU NEAR PORT LAVACA, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
NOV 23...	0930	9	50	0	0	3	60
MAR 29...	1615	3	500	0	2	2	10
AUG 09...	1535	4	1000	0	0	0	20

DATE	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
NOV 23...	0	--	0	.0	0	0	120
MAR 29...	0	--	600	.0	1	0	20
AUG 09...	0	500	--	.0	0	0	20

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLOR- BINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
NOV 23...	0930	.0	5	.00	.00	.0	.0	1	.00	3.5	.00	9.2
MAR 29...	1615	.0	1	.00	.00	.0	.0	16	.00	26	.00	36
AUG 09...	1535	.0	0	.00	.00	.0	.0	17	.00	15	.00	37

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
NOV 23...	.00	6.7	.00	.00	1.3	.00	.0	.00	.00	.0	.00	.0
MAR 29...	.00	6.1	.01	.00	.4	.00	.3	.00	.00	.0	.00	.0
AUG 09...	.00	4.3	.04	.00	.2	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVER (UG/L)
NOV 23...	.00	.0	.00	.01	.00	.00	0	1	.00	.00	.00	.00
MAR 29...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
AUG 09...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00

## GUADALUPE RIVER BASIN

08165300 NORTH FORK GUADALUPE RIVER NEAR HUNT, TX

LOCATION.--Lat 30°03'36", long 99°23'40", Kerr County, Hydrologic Unit 12100201, on right bank 410 ft (125 m) downstream from Ranch Road 1340, 1.3 mi (2.1 km) downstream from Bear Creek, 3.7 mi (6.0 km) west of Hunt, and 4.1 mi (6.6 km) upstream from Honey Creek.

DRAINAGE AREA.--168 mi<sup>2</sup> (435 km<sup>2</sup>).

PERIOD OF RECORD.--August 1967 to current year.

REVISED RECORDS.--WDR TX-74-1: 1971(P).

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 1,800.10 ft (548.670 m) above mean sea level.

REMARKS.--Records good. There is a permit upstream from station issued by the Texas Department of Water Resources to impound and use 20.33 acre-ft (25,100 m<sup>3</sup>) of water on a game preserve. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--10 years, 37.2 ft<sup>3</sup>/s (1.053 m<sup>3</sup>/s), 3.01 in/yr (76 mm/yr), 26,950 acre-ft/yr (33.2 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,400 ft<sup>3</sup>/s (1,090 m<sup>3</sup>/s) Oct. 13, 1973, gage height, 26.55 ft (8.092 m), from rating curve extended above 170 ft<sup>3</sup>/s (4.81 m<sup>3</sup>/s) on basis of slope-area measurements of 7,460 and 38,400 ft<sup>3</sup>/s (211 and 1,090 m<sup>3</sup>/s); minimum, 0.68 ft<sup>3</sup>/s (0.019 m<sup>3</sup>/s) May 30, 1969.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1900 occurred July 1, 1932, gage height, 37.3 ft (11.37 m), discharge 140,000 ft<sup>3</sup>/s (3,960 m<sup>3</sup>/s), by slope-area measurements, combined flow of North Fork Guadalupe River 5 mi (8 km) upstream and Bear Creek 2 mi (3 km) upstream from mouth, and adjusted for difference in drainage area.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 23,200 ft<sup>3</sup>/s (657 m<sup>3</sup>/s) Apr. 15, gage height, 22.11 ft (6.739 m), no other peak above base of 500 ft<sup>3</sup>/s (14.2 m<sup>3</sup>/s); minimum, 17 ft<sup>3</sup>/s (0.48 m<sup>3</sup>/s) for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	28	24	23	25	18	17	51	35	26	21	20
2	20	26	24	23	25	19	18	50	35	26	21	20
3	20	26	24	23	25	20	18	48	35	26	21	20
4	20	25	24	23	24	20	17	47	34	25	21	21
5	21	25	25	23	23	19	17	46	31	25	21	21
6	19	24	25	23	22	18	17	45	32	25	20	21
7	20	24	26	23	22	18	17	44	32	25	20	24
8	22	24	24	23	23	18	17	43	32	25	20	21
9	20	24	24	23	23	18	17	48	32	25	20	21
10	20	24	24	23	22	18	17	51	32	25	20	21
11	20	24	26	22	22	19	17	78	31	24	20	20
12	20	24	26	23	22	18	17	56	31	24	20	19
13	20	27	25	25	21	18	17	53	34	24	21	19
14	20	26	30	25	21	18	21	50	32	24	21	19
15	20	25	27	25	20	18	8640	49	31	24	22	19
16	21	25	26	24	20	17	578	46	30	23	21	18
17	21	26	25	23	20	17	149	42	29	23	21	18
18	20	26	25	23	20	19	98	44	30	23	21	18
19	22	26	25	23	19	17	93	42	29	23	20	18
20	23	25	24	23	19	17	88	42	28	22	20	18
21	21	25	23	23	19	17	86	45	28	22	20	18
22	21	24	23	24	19	17	75	43	28	22	20	18
23	23	24	23	27	20	17	70	41	32	21	20	18
24	23	24	23	26	19	17	66	40	35	21	20	18
25	22	25	23	24	19	17	63	38	31	20	20	18
26	22	25	23	24	19	18	61	38	29	20	20	18
27	22	24	23	24	19	23	58	38	27	20	20	18
28	26	24	23	24	18	21	56	37	27	20	20	18
29	39	24	23	23	---	19	55	37	26	21	20	18
30	37	24	23	24	---	18	52	37	26	22	20	18
31	30	---	23	26	---	18	---	36	---	22	20	---
TOTAL	695	747	756	735	590	566	10532	1405	924	718	632	576
MEAN	22.4	24.9	24.4	23.7	21.1	18.3	351	45.3	30.8	23.2	20.4	19.2
MAX	39	28	30	27	25	23	8640	78	35	26	22	24
MIN	19	24	23	22	18	17	17	36	26	20	20	18
CFSM	.13	.15	.15	.14	.13	.11	2.09	.27	.18	.14	.12	.11
IN.	.15	.17	.17	.16	.13	.13	2.33	.31	.20	.16	.14	.13
AC-FT	1380	1480	1500	1460	1170	1120	20890	2790	1830	1420	1250	1140
CAL YR 1976	TOTAL	8230	MEAN	22.5	MAX	66	MIN	12	CFSM	.13	IN	1.82
WTR YR 1977	TOTAL	18876	MEAN	51.7	MAX	8640	MIN	17	CFSM	.31	IN	4.18
									AC-FT	16320	AC-FT	37440

## 08165500 GUADALUPE RIVER AT HUNT, TX

LOCATION.--Lat 30°04'08", Long 99°19'23", Kerr County, Hydrologic Unit 12100201, on right bank 56 ft (17 m) upstream and 137 ft (42 m) right of right end of bridge on State highway 39, 0.6 mi (1.0 km) downstream from confluence of North and South Forks, 0.8 mi (1.3 km) east of Hunt, and at mile 430.9 (693.3 km).

DRAINAGE AREA.--288 mi<sup>2</sup> (746 km<sup>2</sup>).

PERIOD OF RECORD.--October 1941 to September 1949, discharge not computed above 600 ft<sup>3</sup>/s (17.0 m<sup>3</sup>/s), and April 1965 to current year. Occasional discharge measurements made 1950 to 1964.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage s 1,722.7 ft (525.08 m) above mean sea level.

REMARKS.--Records good. Numerous diversions for irrigation above station, amounts unknown. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--12 years, 67.0 ft<sup>3</sup>/s (1.897 m<sup>3</sup>/s), 3.16 in/yr (80 mm/yr), 48,540 acre-ft/yr (59.8 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47,000 ft<sup>3</sup>/s (1,330 m<sup>3</sup>/s) Aug. 13, 1966, gage height, 21.4 ft (6.52 m), from floodmark, from rating curve extended above 3,700 ft<sup>3</sup>/s (105 m<sup>3</sup>/s) on basis of channel geometry and flow-over-dam measurement of peak flow; minimum, 6.9 ft<sup>3</sup>/s (0.20 m<sup>3</sup>/s) June 17, 1948.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1900, 36.6 ft (11.16 m) July 2, 1932, from information by local resident, discharge 206,000 ft<sup>3</sup>/s (5,830 m<sup>3</sup>/s), determined by slope-area measurement 4.5 mi (7.2 km) downstream from gage.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 15	0800	*28,400 804	18.37 5.599	May 11	0200	19,300 547	16.45 5.014

Minimum discharge, 22 ft<sup>3</sup>/s (0.62 m<sup>3</sup>/s) Aug. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	50	38	39	44	34	34	112	89	56	41	38
2	34	47	39	41	43	36	35	108	87	56	49	38
3	33	47	38	41	42	39	35	105	83	55	47	38
4	34	45	34	41	38	39	33	103	78	53	41	38
5	38	44	39	41	37	36	32	117	75	53	39	39
6	34	35	46	42	36	35	31	96	73	52	33	41
7	33	39	50	41	36	35	30	74	68	50	32	47
8	40	43	41	40	40	36	30	87	66	50	36	47
9	36	53	42	40	40	37	30	191	65	49	35	49
10	35	41	41	39	39	37	34	464	64	48	36	48
11	36	43	44	38	40	37	31	4000	63	48	37	44
12	35	42	46	43	40	35	31	356	63	47	38	43
13	34	48	44	49	38	35	32	234	78	46	39	41
14	34	47	55	46	38	35	94	197	67	45	40	41
15	35	45	52	44	37	36	11600	178	65	46	40	41
16	38	44	48	42	37	34	1530	165	60	46	40	41
17	36	46	46	42	36	34	679	149	58	47	39	40
18	34	46	45	42	37	36	454	145	59	47	38	40
19	37	49	45	40	36	35	397	137	58	47	39	40
20	40	45	43	40	35	33	367	132	56	46	40	43
21	37	43	42	41	35	33	236	141	54	46	38	43
22	36	41	41	42	37	33	191	127	62	45	39	41
23	38	40	32	48	39	33	170	119	88	44	38	40
24	40	42	40	45	35	34	156	112	90	44	39	40
25	38	43	42	44	34	34	154	90	74	43	39	40
26	36	44	42	43	35	36	146	104	65	42	39	40
27	37	41	41	44	35	49	132	89	54	41	39	40
28	44	38	41	43	34	47	125	96	60	42	39	39
29	74	37	41	41	---	39	124	99	58	44	39	38
30	68	38	41	41	---	36	125	96	57	45	40	38
31	53	---	40	45	---	34	---	92	---	42	39	---
TOTAL	1213	1306	1319	1308	1053	1122	17098	8315	2037	1465	1207	1236
MEAN	39.1	43.5	42.5	42.2	37.6	36.2	570	268	67.9	47.3	38.9	41.2
MAX	74	53	55	49	44	49	11600	4000	90	56	49	49
MIN	33	35	32	38	34	33	30	74	54	41	32	38
CFSM	.14	.15	.15	.15	.13	.13	1.98	.93	.24	.16	.14	.14
IN.	.16	.17	.17	.17	.14	.14	2.21	1.07	.26	.19	.16	.16
AC-FT	2410	2590	2620	2590	2090	2230	33910	16490	4040	2910	2390	2450
CAL YR 1976	TOTAL	15299	MEAN	41.8	MAX	595	MIN 13	CFSM .15	IN 1.98	AC-FT	30350	
WTR YR 1977	TOTAL	38679	MEAN	106	MAX	11600	MIN 30	CFSM .37	IN 5.00	AC-FT	76720	



## GUADALUPE RIVER BASIN

08166000 JOHNSON CREEK NEAR INGRAM, TX

LOCATION.--Lat 30°06'00", long 99°16'58", Kerr County, Hydrologic Unit 12100201, on right bank 1.6 mi (2.6 km) upstream from Henderson Branch, 3.4 mi (5.5 km) northwest of Ingram, 3.8 mi (6.1 km) upstream from mouth, and 9.2 mi (14.8 km) northwest of Kerrville.

DRAINAGE AREA.--114 mi<sup>2</sup> (295 km<sup>2</sup>).

PERIOD OF RECORD.--September 1941 to November 1959, October 1961 to current year.

REVISED RECORDS.--WSP 1058: 1942-45. WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,721.30 ft (524.652 m) above mean sea level.

REMARKS.--Records good. Numerous small diversions above station for irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years, 17.5 ft<sup>3</sup>/s (0.496 m<sup>3</sup>/s), 2.08 in/yr (53 mm/yr), 12,680 acre-ft/yr (15.6 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 95,900 ft<sup>3</sup>/s (2,720 m<sup>3</sup>/s) Oct. 4, 1959, gage height, 24.25 ft (7.391 m), from rating curve extended above 4,400 ft<sup>3</sup>/s (125 m<sup>3</sup>/s) on basis of slope-area measurements of 9,100 and 16,000 ft<sup>3</sup>/s (258 and 453 m<sup>3</sup>/s) and conveyance study; minimum daily, 0.4 ft<sup>3</sup>/s (0.011 m<sup>3</sup>/s) July 26, 27, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1852, 35 ft (10.7 m) July 2, 1932, from information by local resident; discharge, 138,000 ft<sup>3</sup>/s (3,910 m<sup>3</sup>/s), by slope-area measurement at point 0.5 mi (0.8 km) downstream from State fish hatchery and 6 or 7 mi (10 or 11 km) upstream from gage. Flood of June 14, 1935, reached a stage of 31 or 32 ft (9.4 or 9.8 m), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft<sup>3</sup>/s (14.2 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 15	1200	*15,500 439	11.62 3.542	May 11	0030	12,200 346	10.69 3.258

Minimum discharge, 14 ft<sup>3</sup>/s (0.40 m<sup>3</sup>/s) Mar. 21-23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	28	22	20	20	17	16	47	55	49	21	19
2	22	26	22	20	20	17	16	47	56	46	21	18
3	23	26	22	20	20	18	16	47	52	43	21	18
4	23	26	22	21	19	17	15	47	51	40	20	18
5	24	25	22	21	19	17	15	47	49	38	22	18
6	23	25	23	20	19	17	15	45	49	36	22	22
7	23	25	22	20	19	16	15	44	47	35	21	22
8	24	25	21	20	21	16	15	42	41	34	21	22
9	23	24	22	20	21	16	15	51	41	32	21	21
10	23	24	22	20	19	17	15	151	41	30	21	20
11	23	24	23	20	20	15	15	1150	42	30	20	19
12	23	24	22	20	20	15	15	123	42	29	21	19
13	23	25	22	21	20	15	15	97	45	28	24	19
14	23	24	24	20	19	16	20	86	44	28	22	17
15	23	24	22	20	18	16	4050	80	45	27	21	18
16	24	25	22	20	18	15	448	78	48	27	20	17
17	24	25	22	20	18	15	174	74	47	26	18	16
18	24	25	22	20	17	15	113	72	49	25	18	17
19	26	25	22	19	18	15	101	70	51	25	19	18
20	25	24	22	19	17	14	93	67	53	25	19	21
21	24	23	22	19	18	14	85	73	53	26	19	19
22	24	22	22	21	18	14	78	65	54	25	19	20
23	24	23	20	21	18	14	74	64	78	24	20	20
24	24	22	20	20	17	15	70	61	67	23	19	20
25	24	23	21	20	19	16	67	61	55	23	19	21
26	23	23	20	20	18	16	64	58	53	22	18	20
27	23	22	20	20	17	19	58	58	53	22	18	19
28	25	22	20	19	16	17	53	58	50	21	18	17
29	44	22	20	19	---	16	52	56	51	24	19	18
30	55	22	20	20	---	16	50	56	50	24	19	18
31	31	---	20	21	---	15	---	55	---	21	18	---
TOTAL	790	723	668	621	523	491	5848	3130	1512	908	619	571
MEAN	25.5	24.1	21.5	20.0	18.7	15.8	195	101	50.4	29.3	20.0	19.0
MAX	55	28	24	21	21	19	4050	1150	78	49	24	22
MIN	22	22	20	19	16	14	15	42	41	21	18	16
CFSM	.22	.21	.19	.18	.16	.14	1.71	.89	.44	.26	.18	.17
IN.	.26	.24	.22	.20	.17	.16	1.91	1.02	.49	.30	.20	.19
AC-FT	1570	1430	1320	1230	1040	974	11600	6210	3000	1800	1230	1130
CAL YR 1976	TOTAL	7801	MEAN 21.3	MAX 72	MIN 13	CFSM .19	IN 2.55	AC-FT 15470				
WTR YR 1977	TOTAL	16404	MEAN 44.9	MAX 4050	MIN 14	CFSM .39	IN 5.35	AC-FT 32540				

## 08167000 GUADALUPE RIVER AT COMFORT, TX

LOCATION.--Lat 29°57'55", long 98°53'49", Kendall County, Hydrologic Unit 12100201, on left bank at downstream side of pier of bridge on U.S. Highway 87, 0.1 mi (0.2 km) downstream from Cypress Creek, and at mile 396.6 (638.1 km).

DRAINAGE AREA.--838 mi<sup>2</sup> (2,170 km<sup>2</sup>).

PERIOD OF RECORD.--May 1939 to current year.

REVISED RECORDS.--WSP 1632: 1958. WSP 1732: 1939(M). WSP 2123: Drainage area, 1944(M), 1952(M), 1957(M), 1960(M).

GAGE.--Water-stage recorder. Datum of gage is 1,372.05 ft (418.201 m) above mean sea level. Prior to Nov. 27, 1939, nonrecording gage.

REMARKS.--Records good. Many small diversions above station for irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--38 years (water years 1940-77), 167 ft<sup>3</sup>/s (4.729 m<sup>3</sup>/s), 121,000 acre-ft/yr (149 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 111,000 ft<sup>3</sup>/s (3,140 m<sup>3</sup>/s) Oct. 4, 1959, gage height, 33.15 ft (10.104 m), from rating curve extended above 65,000 ft<sup>3</sup>/s (1,840 m<sup>3</sup>/s) on basis of slope-area measurement of 182,000 ft<sup>3</sup>/s (5,150 m<sup>3</sup>/s), gage height, 38.4 ft (11.70 m), made at former gaging station "near Comfort" 5 mi (8 km) upstream; no flow at times in 1952-57, 1963-64.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1848, 40.3 ft (12.28 m) in July 1869, from report by Corps of Engineers. Flood of July 1, 1932, reached a stage of 38.4 ft (11.70 m), from floodmark, from information by State Highway Department, and flood of July 16, 1900, reach about the stage as that of July 1, 1932, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above ase of 2,600 ft<sup>3</sup>/s (73.6 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Apr. 15	1700	*54,400	1,540	25.93	7.903	May 11	1600	12,700	360	16.70	5.090

Minimum discharge, 66 ft<sup>3</sup>/s (1.87 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	180	238	175	221	241	195	168	479	387	208	117	81
2	163	214	185	225	241	195	168	447	387	202	117	79
3	156	203	174	227	249	208	163	441	364	197	113	79
4	153	197	165	225	238	205	160	434	337	188	117	79
5	170	192	191	222	233	197	150	410	321	185	113	79
6	162	189	246	225	229	189	150	410	311	183	112	86
7	156	184	225	221	229	186	150	387	321	180	109	91
8	162	176	221	219	241	184	147	359	294	176	103	100
9	161	179	215	224	237	180	146	359	288	171	102	99
10	157	181	214	215	233	183	146	554	276	168	98	94
11	152	179	247	213	245	183	142	4820	268	163	98	90
12	151	173	247	223	237	178	140	1480	262	161	96	85
13	150	198	242	282	221	177	141	910	293	155	97	84
14	150	197	256	267	219	176	425	753	280	152	100	83
15	155	193	257	251	214	177	23500	684	263	154	98	77
16	159	186	253	244	213	172	8760	631	256	153	96	73
17	156	189	248	237	211	171	2320	582	245	152	94	72
18	154	187	246	243	208	171	1350	554	236	145	94	71
19	162	191	250	237	206	171	1080	526	228	144	93	72
20	171	191	246	232	203	169	1280	512	216	141	93	75
21	161	188	236	229	202	165	1160	625	212	141	97	75
22	154	183	237	240	204	163	1030	547	214	139	95	75
23	154	179	237	270	207	162	867	479	327	138	92	71
24	159	180	231	253	199	160	775	441	495	134	86	72
25	159	184	232	244	196	156	684	422	334	130	86	70
26	153	191	232	241	198	169	631	392	272	129	86	71
27	153	183	231	240	194	225	575	392	241	124	81	72
28	162	177	230	235	195	210	531	381	218	121	82	71
29	338	173	225	227	---	194	512	381	215	120	83	68
30	318	176	226	233	---	179	499	392	214	122	83	66
31	281	---	222	249	---	170	---	381	---	120	82	---
TOTAL	5372	5651	7042	7314	6143	5620	47950	20565	8575	4796	3013	2360
MEAN	173	188	227	236	219	181	1598	663	286	155	97.2	78.7
MAX	338	238	257	282	249	225	23500	4820	495	208	117	100
MIN	150	173	165	213	194	156	140	359	212	120	81	66
AC-FT	10660	11210	13970	14510	12180	11150	95110	40790	17010	9510	5980	4680
CAL YR 1976	TOTAL	63652	MEAN 174	MAX 1270	MIN 88	AC-FT 126300						
WTR YR 1977	TOTAL	124401	MEAN 341	MAX 23500	MIN 66	AC-FT 246700						

## GUADALUPE RIVER BASIN

08167500 GUADALUPE RIVER NEAR SPRING BRANCH, TX

LOCATION.--Lat 29°51'38", long 98°22'58", Comal County, Hydrologic Unit 12100201, on right bank at downstream side of bridge on county road, 226 ft (69 m), downstream from bridge on Ranch Road 311, 1.9 mi (3.1 km) southeast of Spring Branch Post Office, 7.5 mi (12.1 km) downstream from Curry Creek, and at mile 334.4 (538.0 km).

DRAINAGE AREA.--1,315 mi<sup>2</sup> (3,406 km<sup>2</sup>).

PERIOD OF RECORD.--June 1922 to current year.

REVISED RECORDS.--WSP 1562: 1923-24, 1926, 1927-28(M), 1929, 1930(M). WSP 2123: Drainage area.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 948.10 ft (288.981 m) above mean sea level.

REMARKS.--Records good. Several small diversions above station for irrigation. Several observations of water temperature were made during the year. Guadalupe-Blanco River Authority gage-height telemeter at station.

AVERAGE DISCHARGE.--55 years, 293 ft<sup>3</sup>/s (8,298 m<sup>3</sup>/s), 212,300 acre-ft/yr (262 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 121,000 ft<sup>3</sup>/s (3,430 m<sup>3</sup>/s) July 3, 1932 (gage height, 42.10 ft or 12.832 m), from rating curve extended above 70,000 ft<sup>3</sup>/s (1,980 m<sup>3</sup>/s); no flow at times in 1951-52, 1954-56, and 1963-64.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1859, about 53 ft (16.2 m) in 1869; flood in July 1900 reached a stage of about 49 ft (14.9 m), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,000 ft<sup>3</sup>/s (113 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Apr. 16	1300	*41,900	1,190	30.93	9.427	May 12	0800	9,500	269	14.04	4.279
Apr. 20	0100	8,270	234	13.00	3.962						

Minimum discharge, 103 ft<sup>3</sup>/s (2.92 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	242	646	367	460	493	395	299	1210	715	377	173	114
2	231	589	364	463	497	400	306	1150	1090	365	168	114
3	220	548	367	470	516	414	294	1130	753	352	171	112
4	401	514	361	473	523	423	285	1120	694	340	166	108
5	1100	475	362	456	498	409	269	1080	651	327	167	107
6	287	446	418	457	481	390	256	1060	624	321	162	112
7	262	426	485	457	473	377	253	1020	623	314	155	127
8	246	414	440	444	478	371	250	967	603	306	153	125
9	246	411	422	440	504	367	248	906	576	295	149	132
10	244	410	418	428	504	370	244	959	564	285	145	134
11	238	413	465	410	530	369	240	1260	546	278	144	131
12	228	403	564	414	551	355	234	5000	534	269	143	125
13	222	411	542	474	530	347	246	1610	589	259	144	137
14	219	427	574	609	522	344	333	1260	563	249	146	129
15	290	412	606	554	505	342	2390	1140	538	245	151	121
16	418	404	592	517	490	331	29900	1080	503	243	145	120
17	318	394	583	487	490	328	8260	1050	479	238	141	116
18	280	393	575	480	486	326	3340	1010	459	236	139	112
19	288	419	582	479	471	319	2770	1180	433	231	141	111
20	310	431	581	466	453	305	4250	1160	412	228	135	118
21	312	416	557	454	450	302	2790	1100	402	221	135	118
22	291	397	548	463	459	294	2500	1200	398	213	133	118
23	284	384	551	524	461	287	2110	1030	415	210	131	115
24	405	379	543	547	438	286	1870	939	712	206	127	113
25	305	387	545	505	428	286	1700	875	665	202	124	110
26	287	416	528	493	419	286	1550	824	541	194	122	109
27	274	415	523	495	406	327	1440	779	468	189	121	108
28	279	391	525	483	398	440	1350	769	419	184	120	107
29	996	375	504	452	---	382	1290	755	393	179	120	108
30	965	369	498	453	---	347	1250	735	383	176	120	106
31	727	---	478	479	---	313	---	728	---	176	114	---
TOTAL	11415	12915	15468	14786	13454	10832	72517	36086	16745	7908	4405	3517
MEAN	368	431	499	477	481	349	2417	1164	558	255	142	117
MAX	1100	646	606	609	551	440	29900	5000	1090	377	173	137
MIN	219	369	361	410	398	286	234	728	383	176	114	106
AC-FT	22640	25620	30680	29330	26690	21490	143800	71580	33210	15690	8740	6980
CAL YR 1976	TOTAL	139380	MEAN	381	MAX	7600	MIN	119	AC-FT	276500		
WTR YR 1977	TOTAL	220048	MEAN	603	MAX	29900	MIN	106	AC-FT	436500		

## 08167600 REBECCA CREEK NEAR SPRING BRANCH, TX

LOCATION.--Lat 29°55'06", long 98°22'10", Comal County, Hydrologic Unit 12100201, on right bank 72 ft (22 m) upstream from private road crossing, 2.9 mi (4.7 km) upstream from mouth, 3.7 mi (6.0 km) northeast of Spring Branch Post Office, and 6.3 mi (10.1 km) south of Twin Sisters.

DRAINAGE AREA.--10.9 mi<sup>2</sup> (28.2 km<sup>2</sup>).

PERIOD OF RECORD.--January 1960 to current year.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 985.55 ft (300.396 m) above mean sea level (Corps of Engineers bench mark).

REMARKS.--Records good. Six dams forming recreational lakes at housing developments upstream control runoff from 3.13 mi<sup>2</sup> (8.11 km<sup>2</sup>) drainage area. Amount of impoundment unknown. Recording rain gage located at station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years, 5.56 ft<sup>3</sup>/s (0.157 m<sup>3</sup>/s), 4,030 acre-ft/yr (4.97 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,300 ft<sup>3</sup>/s (263 m<sup>3</sup>/s) Oct. 18, 1965, gage height, 7.97 ft (2.429 m), from rating curve extended above 420 ft<sup>3</sup>/s (11.9 m<sup>3</sup>/s) on basis of critical-depth measurement of 4,340 ft<sup>3</sup>/s (123 m<sup>3</sup>/s); no flow in 1963-65, 1967, 1971 and 1974.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1885, 25.5 ft (7.77 m) in September 1952. Flood in 1947 or 1948 was about 4.5 ft (1.4 m) lower than flood in 1952, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)	Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)
Oct. 4	2200	*6,550	185	a7.24	2.207	Apr. 16	0900	912	25.8	3.87	1.180
Oct. 29	1100	145	4.11	2.78	0.847	Apr. 19	2215	1,030	29.2	3.99	1.216
Apr. 15	1430	589	16.7	3.48	1.061	May 19	1945	931	26.4	3.89	1.186

a From floodmark.

Minimum discharge, 0.74 ft<sup>3</sup>/s (0.021 m<sup>3</sup>/s) Aug. 15, 25, 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	24	9.0	5.4	6.0	3.8	2.9	14	10	4.1	1.5	.95
2	2.5	17	8.9	5.4	6.0	3.8	2.9	13	9.6	3.8	1.5	.95
3	2.5	14	8.9	5.4	6.4	3.8	3.1	12	9.0	3.4	1.5	.95
4	289	12	8.9	5.4	6.7	4.3	2.9	12	8.5	3.3	1.5	.95
5	44	12	9.5	5.4	6.7	3.8	2.9	11	8.0	3.0	1.4	.95
6	6.7	11	9.2	5.4	7.2	3.8	2.9	8.9	6.5	2.9	1.2	1.3
7	4.8	11	8.8	5.4	7.4	3.8	2.9	8.1	6.0	2.9	1.2	1.2
8	4.3	10	8.1	5.4	6.9	3.8	2.9	7.9	5.4	2.9	1.2	1.1
9	4.3	11	7.9	5.1	6.4	4.3	2.9	7.4	5.4	2.9	1.2	.95
10	4.3	11	7.5	4.8	6.4	4.3	2.9	7.4	5.4	2.8	.95	.95
11	4.3	9.9	7.4	4.8	6.0	4.3	2.9	24	5.3	2.5	.95	.95
12	4.8	9.4	6.7	4.8	5.9	3.8	2.9	12	4.8	2.5	.95	.95
13	4.8	13	6.7	5.9	5.4	3.8	3.1	9.7	6.3	2.5	.95	.95
14	4.8	11	6.7	7.4	5.4	3.8	5.2	8.9	4.8	2.5	.95	.95
15	6.0	11	6.7	7.4	5.4	3.8	71	8.9	4.8	2.4	.89	.95
16	8.9	11	7.0	7.4	5.4	3.8	205	8.8	4.8	2.1	.95	.95
17	6.6	11	7.4	7.4	4.9	3.8	57	8.1	4.3	2.1	.95	.95
18	5.4	11	7.4	6.7	5.4	3.8	38	8.1	3.8	2.1	.95	.88
19	8.1	15	7.4	6.7	5.1	3.7	96	76	3.7	2.0	.95	1.1
20	9.7	16	7.4	6.7	4.8	3.3	147	35	3.3	1.8	.95	1.5
21	8.1	14	6.9	6.7	4.8	3.5	76	26	4.6	1.8	.95	1.5
22	8.1	14	6.7	7.3	4.8	3.5	50	22	5.7	1.8	.95	1.5
23	8.1	13	6.7	8.0	4.8	3.5	38	19	5.5	1.8	.95	1.4
24	11	13	6.7	8.1	4.8	3.3	31	17	7.0	1.6	.95	1.4
25	12	14	6.7	8.1	4.3	3.3	25	16	5.7	1.5	.90	1.3
26	12	14	6.7	8.1	4.3	3.4	22	15	5.4	1.5	.83	1.3
27	11	12	6.7	8.1	3.8	4.0	20	14	4.9	1.5	.95	1.2
28	12	11	7.0	8.1	3.8	3.7	18	13	4.8	1.5	.95	1.2
29	78	11	7.4	8.1	---	3.3	16	13	4.3	1.5	.95	1.2
30	48	9.2	7.3	8.1	---	3.1	15	12	4.3	1.4	.96	1.2
31	32	---	5.4	7.1	---	2.8	---	11	---	1.5	.95	---
TOTAL	668.6	376.5	231.7	204.1	155.2	114.8	968.3	479.2	171.9	71.9	32.88	33.58
MEAN	21.6	12.6	7.47	6.58	5.54	3.70	32.3	15.5	5.73	2.32	1.06	1.12
MAX	289	24	9.5	8.1	7.4	4.3	205	76	10	4.1	1.5	1.5
MIN	2.5	9.2	5.4	4.8	3.8	2.8	2.9	7.4	3.3	1.4	.83	.88
AC-FT	1330	747	460	405	308	228	1920	950	341	143	65	67
CAL YR 1976	TOTAL	2721.49	MEAN	7.44	MAX	289	MIN	.56	AC-FT	5400		
WTR YR 1977	TOTAL	3508.66	MEAN	9.61	MAX	289	MIN	.83	AC-FT	6960		



## GUADALUPE RIVER BASIN

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX

LOCATION.--Lat 29°52'07", long 98°11'55", Comal County, Hydrologic Unit 12100201, in intake structure of Canyon Dam on Guadalupe River, 12 mi (19 km) northwest of New Braunfels, and at mile 303.0 (487.5 km).

DRAINAGE AREA.--1,432 mi<sup>2</sup> (3,709 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1962 to current year. Prior to October 1970, published as Canyon Reservoir.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers). Prior to Sept. 24, 1964, nonrecording gage at present site and datum.

REMARKS.--The lake is formed by a rolled earthfill dam 6,830 ft (2,082 m) long, consisting of the main dam 4,410 ft (1,344 m) long, an earthen dike 210 ft (64 m) long, a 1,260-foot (384 m) long uncontrolled broad-crested type spillway, and a 950-foot (290 m) concrete and earthen nonoverflow section. Deliberate impoundment of water began June 16, 1964, and main part of dam was completed in August 1964. The flood-control outlet works consist of a 10.0-foot-diameter (3.0 m) conduit controlled by two 5.7-foot by 10.0-foot (1.7 by 3.0 m) hydraulically operated slide gates. The lake was built for water conservation and flood control. Capacity table beginning Oct. 1, 1974, is based on a sedimentation survey of August 1972. Small diversions above the lake for irrigation. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	974.0	-
Crest of spillway.....	943.0	736,700
Top of conservation pool.....	909.0	382,000
Lowest gated outlet (invert).....	775.0	240

COOPERATION.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 460,400 acre-ft (568 hm<sup>3</sup>) Apr. 22, 1977, elevation, 917.96 ft (279.794 m); minimum observed since conservation pool first reached in April 1968, 340,700 acre-ft (420 hm<sup>3</sup>) Oct. 6, 1975, elevation, 903.81 ft (275.481 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 460,400 acre-ft (568 hm<sup>3</sup>) Apr. 22, elevation, 917.96 ft (279.794 m); minimum, 347,100 acre-ft (428 hm<sup>3</sup>) Sept. 30, elevation, 904.64 ft (275.734 m).

Capacity table (elevation, in feet, and total contents, in acre-feet)

904.0	342,200	912.0	407,300
906.0	357,800	914.0	424,600
908.0	373,800	916.0	442,400
910.0	390,300	918.0	460,800

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	349500	374900	381300	382200	378000	376800	364600	401300	391000	378300	353200	348500
2	349600	376100	381300	382000	378100	376600	364200	394100	391500	377500	353100	348400
3	349500	376800	381300	381600	378400	376800	363800	387000	391300	376700	353100	348400
4	351500	377300	381200	381400	378500	376700	363000	379900	391100	376000	353000	348400
5	354200	377500	381800	381200	378400	376300	362200	376700	391000	375300	352800	348400
6	354600	377900	382100	380900	378200	376000	361600	377400	390700	374600	352400	348700
7	354900	378100	382200	380500	378200	375500	360900	378200	390100	373800	352400	348500
8	354800	378200	382200	380500	378100	375000	360300	379000	389600	372900	352000	348500
9	354600	378400	382400	380000	378300	374700	359800	379500	389100	372100	351800	348400
10	354600	378500	382900	379500	378500	374500	359100	380700	388600	371300	351700	348400
11	354600	378500	383400	379000	379100	374100	358600	382000	388100	370400	351400	348400
12	354400	378800	383700	379000	379200	373600	358000	390300	387400	369400	351300	348400
13	354400	378900	383900	379100	379200	373000	358800	392700	387100	368600	351100	348400
14	354400	378900	384000	379300	379100	372600	358800	393600	386600	367700	350800	348300
15	356600	379000	384100	379200	379100	372400	364200	394500	386000	366700	350600	348200
16	357200	379000	384100	379000	379100	371800	416800	392300	385100	365800	350300	348200
17	357400	379000	384100	378800	379000	371500	433800	386800	384500	365000	350200	348100
18	357600	379500	384200	378600	379100	371200	440500	384300	383800	364000	350000	348000
19	358200	380000	384400	378400	379000	370400	442700	386100	383100	363000	349800	348000
20	358200	380400	384400	378200	378800	369900	452600	387500	382200	362100	349500	347900
21	358600	380500	384200	378000	378700	369300	459000	388400	381600	361000	349300	347800
22	358800	380500	384000	378200	378700	368600	458500	389500	381600	360400	349200	347800
23	359200	380700	384000	378300	378400	367900	453400	390100	381300	359600	349200	347700
24	362300	380800	383900	378300	378100	367500	447500	390600	381400	358900	349200	347700
25	363000	381200	383800	378300	378100	367100	441500	390900	381400	358100	349100	347600
26	363600	381400	383600	378300	377800	366800	434600	391100	381300	357300	348900	347500
27	363900	381600	383500	378200	377500	366800	428300	391000	380800	356800	348800	347400
28	365000	381300	383200	378100	377200	366400	422500	390900	380000	356100	348800	347300
29	369200	381300	383100	378000	---	366200	413500	390900	379600	355300	348800	347200
30	371500	381300	382800	378100	---	365500	408000	390900	378900	354600	348700	347100
31	373400	---	382300	377900	---	365000	---	391000	---	353700	348700	---
(†)	907.95	908.92	909.04	908.50	908.41	906.90	912.08	910.08	908.62	905.48	904.84	904.64
(*)	+24000	+7900	+1000	-4400	-700	-12200	+43000	-17000	-25200	-5000	-1600	
MAX	373400	381600	384400	382200	379200	376800	459000	401300	391500	378300	353200	348700
MIN	349500	374900	381200	377900	377200	365000	358000	376700	378900	353700	348700	347100
CAL YR 1976.....	* +24500			MAX 384700			MIN 346500					
WTR YR 1977.....	* -2300			MAX 459000			MIN 347100					

† Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

GUADALUPE RIVER BASIN

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08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
MAR 30...	1545	407	8.0	16.0	200	21	51	18	10
JUN 21...	1435	389	7.7	19.0	190	18	53	15	7.8
DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
MAR 30...	.3	1.6	220	0	15	16	.2	10	230
JUN 21...	.2	1.9	210	0	14	12	.2	10	217



## GUADALUPE RIVER BASIN

## 08167800 GUADALUPE RIVER AT SATTLER, TX

LOCATION.--Lat 29°51'32", long 98°10'47", Comal County, Hydrologic Unit 12100202, on right bank 200 ft (61 m) upstream from Horseshoe Falls, 0.8 mi (1.3 km) north of Sattler, 1.8 mi (2.9 km) downstream from Canyon Dam, 2.3 mi (3.7 km) upstream from Heiser Hollow, 11.2 mi (18.0 km) north of New Braunfels, and at mile 301.2 (484.6 km).

DRAINAGE AREA.--1,436 mi<sup>2</sup> (3,719 km<sup>2</sup>), 1,432 mi<sup>2</sup> (3,709 km<sup>2</sup>) is above Canyon Dam.

PERIOD OF RECORD.--March 1960 to current year.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 742.24 ft (226.235 m) above mean sea level (Corps of Engineers bench mark).

REMARKS.--Records good. Flow completely regulated since July 21, 1962, by Canyon Lake (station 08167700) 1.8 mi (2.9 km) upstream. Small diversions above station for irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--15 years (water years 1962-77), 366 ft<sup>3</sup>/s (10.37 m<sup>3</sup>/s), 265,200 acre-ft/yr (327 hm<sup>3</sup>/yr) since regulation began at Canyon Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,800 ft<sup>3</sup>/s (589 m<sup>3</sup>/s) Oct. 29, 1960, gage height, 12.20 ft (3.719 m). Maximum discharge since closure of Canyon Dam on July 21, 1962, 5,390 ft<sup>3</sup>/s (153 m<sup>3</sup>/s) Feb. 11, 1975, gage height, 8.18 ft (2.493 m); no flow July 31 to Aug. 6, 1962 (result of closure of Canyon Dam), and part of Jan. 29, 30, Feb. 1, 1965 (result of closure while constructing control).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in July 1869 (stage unknown) has not been exceeded since that date; flood in July 1900 (stage unknown) exceeded 39 ft (11.9 m); maximum stage since at least 1904, 39 ft (11.9 m) in July 1932 and June 1935, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,320 ft<sup>3</sup>/s (151 m<sup>3</sup>/s) Apr. 22, gage height, 8.16 ft (2.487 m); minimum, 2.4 ft<sup>3</sup>/s (0.068 m<sup>3</sup>/s) Oct. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	222	442	649	649	656	642	5210	754	677	345	90
2	195	218	442	649	649	656	642	5190	754	677	197	90
3	195	354	442	649	465	656	642	5150	755	677	197	112
4	97	442	442	649	652	656	642	5150	758	677	197	112
5	9.2	442	442	649	656	656	642	2940	763	672	197	93
6	3.3	442	442	649	656	656	642	742	763	670	197	93
7	46	442	442	649	656	656	630	677	763	670	197	93
8	160	442	442	649	656	656	594	677	763	670	197	93
9	201	442	442	649	656	656	594	677	763	670	197	93
10	203	442	442	649	656	649	594	450	763	670	197	93
11	200	442	442	649	665	649	594	669	763	670	197	93
12	203	442	442	649	670	649	594	670	763	670	197	93
13	206	442	548	649	670	649	594	670	763	670	197	93
14	206	442	642	649	670	649	597	670	763	670	197	93
15	230	442	642	649	670	649	524	670	763	670	197	93
16	227	442	645	649	664	649	275	2170	763	670	197	93
17	219	442	649	649	663	649	273	3870	763	670	197	126
18	212	442	649	649	663	649	226	2420	763	670	199	95
19	208	442	649	649	663	649	1840	670	763	670	197	95
20	206	442	649	649	663	649	554	670	763	670	197	95
21	206	442	649	649	663	649	193	670	712	670	197	95
22	206	442	649	649	663	649	2160	670	680	600	139	95
23	206	442	649	649	663	649	5270	670	679	542	92	95
24	272	442	649	649	656	642	5210	699	677	542	92	95
25	231	442	649	649	656	642	5210	737	677	542	92	95
26	222	442	649	649	656	642	5210	746	677	542	92	95
27	218	442	649	649	656	642	5210	746	677	542	92	95
28	215	442	649	649	656	642	5210	754	677	542	91	95
29	245	442	649	649	---	642	5210	754	677	542	90	95
30	237	442	649	649	---	642	5210	754	677	542	90	95
31	228	---	649	649	---	642	---	754	---	542	90	---
TOTAL	5761.5	12728	17516	20119	18281	20126	56428	47966	22039	19578	5247	2881
MEAN	186	424	565	649	653	649	1881	1547	735	632	169	96.0
MAX	272	442	649	649	670	656	5270	5210	763	677	345	126
MIN	3.3	218	442	649	465	642	193	450	677	542	90	90
AC-FT	11430	25250	34740	39910	36260	39920	111900	95140	43710	38830	10410	5710
CAL YR 1976	TOTAL	147966.8	MEAN	404	MAX	714	MIN	3.0	AC-FT	293500		
WTR YR 1977	TOTAL	248670.5	MEAN	681	MAX	5270	MIN	3.3	AC-FT	493200		

## GUADALUPE RIVER BASIN

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## 08168500 GUADALUPE RIVER ABOVE COMAL RIVER AT NEW BRAUNFELS, TX

LOCATION.--Lat 29°42'53", Long 98°06'35", Comal County, Hydrologic Unit 12100202, on right bank at New Braunfels, 1.1 mi (1.8 km) upstream from Comal River, 21.9 mi (35.2 km) downstream from Canyon Lake, and at mile 281.1 (452.3 km).

DRAINAGE AREA.--1,518 mi<sup>2</sup> (3,932 km<sup>2</sup>).

PERIOD OF RECORD.--December 1927 to current year.

REVISED RECORDS.--WSP 898: 1935. WSP 1562: 1932. WSP 2123: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 586.65 ft (178.811 m) above mean sea level.

REMARKS.--Records good. Small diversions for irrigation below station 08167800 and above this station. Since July 21, 1962, flow is largely regulated by Canyon Lake (station 08167700) 21.9 mi (35.2 km) upstream. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years (water years 1929-62) prior to regulation by Canyon Lake, 372 ft<sup>3</sup>/s (10.54 m<sup>3</sup>/s), 269,500 acre-ft/yr (332 hm<sup>3</sup>/yr); 15 years (water years 1963-77) regulated, 459 ft<sup>3</sup>/s (13.00 m<sup>3</sup>/s), 332,500 acre-ft/yr (410 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD RECORD.--Maximum discharge, 101,000 ft<sup>3</sup>/s (2,860 m<sup>3</sup>/s) June 15, 1935, gage height, 32.95 ft (10.043 m); no flow July 8, 9, July 17, to Aug. 20, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1845, 38 ft (11.6 m) July 8, 1869, and in December 1913, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,520 ft<sup>3</sup>/s (213 m<sup>3</sup>/s) Oct. 24, gage height, 7.92 ft (2.414 m); minimum 75 ft<sup>3</sup>/s (2.12 m<sup>3</sup>/s) Oct. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80	644	612	816	836	849	820	5530	1020	836	563	179
2	166	575	612	821	836	854	814	5500	1020	836	304	179
3	269	603	612	814	704	863	814	5490	1020	836	305	196
4	266	729	612	814	787	849	814	5460	1020	829	305	199
5	164	698	627	814	848	840	803	4000	1010	825	305	182
6	109	678	643	814	848	836	803	1040	1010	825	305	179
7	92	659	635	814	843	834	803	918	1010	825	305	179
8	173	649	631	814	847	845	763	894	1010	820	305	179
9	257	640	631	808	848	845	760	894	1020	814	305	179
10	281	640	631	803	857	848	754	718	1020	814	305	179
11	281	631	634	806	915	841	749	843	1000	814	305	179
12	281	621	634	820	940	836	751	878	989	814	302	182
13	281	621	676	831	922	836	796	870	1010	814	299	179
14	275	621	848	836	912	836	828	870	1010	814	299	179
15	410	612	848	836	905	836	1090	870	1000	809	299	177
16	662	612	848	831	894	836	934	1650	1000	803	299	174
17	471	618	848	825	892	836	706	4110	1000	803	299	206
18	419	612	848	825	884	831	568	3350	1000	803	299	179
19	409	643	852	825	879	825	1550	932	999	803	299	174
20	414	640	843	825	870	825	1780	928	987	803	293	174
21	393	634	836	825	870	825	609	923	945	803	293	174
22	380	626	836	839	870	824	1530	906	871	767	287	174
23	373	621	836	859	864	824	5710	905	891	645	194	174
24	1770	621	836	853	859	825	5690	927	866	640	179	174
25	829	625	836	848	859	825	5670	991	859	635	179	174
26	660	623	836	836	859	830	5660	1020	859	631	179	174
27	577	615	829	836	858	834	5640	1020	853	631	179	174
28	538	610	825	836	850	825	5620	1020	848	631	179	173
29	1120	608	825	827	---	825	5580	1020	848	631	179	170
30	897	617	825	840	---	825	5550	1010	848	631	179	170
31	733	---	815	836	---	825	---	1010	---	628	179	---
TOTAL	14030	18946	23260	25627	24156	25888	64959	56497	28843	23613	8506	5364
MEAN	453	632	750	827	863	835	2165	1822	961	762	274	179
MAX	1770	729	852	859	940	863	5710	5530	1020	836	563	206
MIN	80	575	612	803	704	824	568	718	848	628	179	170
AC-FT	27830	37580	46140	50830	47910	51350	128800	112100	57210	46840	16870	10640
CAL YR 1976 TOTAL	193849			MEAN 530	MAX 1770	MIN 80	AC-FT 384500					
WTR YR 1977 TOTAL	319689			MEAN 876	MAX 5710	MIN 80	AC-FT 634100					

## GUADALUPE RIVER BASIN

08169000 COMAL RIVER AT NEW BRAUNFELS, TX

LOCATION.--Lat 29°42'21", long 98°07'20", Comal County, Hydrologic Unit 12100202, on right bank 200 ft (61 m) upstream from San Antonio Street viaduct in New Braunfels and 1.1 mi (1.8 km) upstream from mouth.

DRAINAGE AREA.--130 mi<sup>2</sup> (337 km<sup>2</sup>). Normal flow of river comes from springs; drainage area not applicable.

PERIOD OF RECORD.--1882 to current year (1882 to November 1927, discharge measurements only).

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Concrete control since Oct. 1, 1955. Datum of gage is 582.80 ft (177.637 m) above mean sea level.

REMARKS.--Records good. The flow from Comal Springs emerges from the Edwards and associated limestones in the Balcones Fault Zone. Except during periods of rainfall, flow of river is primarily from Comal Springs about 1.0 mi (1.6 km) upstream. Diurnal fluctuations from steam powerplant 0.5 mi (0.8 km) upstream. Flow is affected at times by discharge from flood-detention pools of three floodwater-retarding structures with combined detention capacity of 3,310 acre-ft (4.08 hm<sup>3</sup>). These structures control runoff from 25.9 mi<sup>2</sup> (67.1 km<sup>2</sup>). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--45 years (water years 1933-77), 296 ft<sup>3</sup>/s (8.383 m<sup>3</sup>/s), 214,500 acre-ft/yr (264 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 60,800 ft<sup>3</sup>/s (1,720 m<sup>3</sup>/s) May 11, 1972, gage height, 36.55 ft (11.140 m), from flood-mark, from rating curve extended above 13,000 ft<sup>3</sup>/s (368 m<sup>3</sup>/s) on basis of contracted-opening measurements on Blieders and Dry Comal Creeks and unit rainfall-runoff studies; no flow from Comal Springs from June 13 to Nov. 3, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood information begins with flood of July 8, 1869, which reached a stage of 36.91 ft (11.250 m), from painted and dated marks in old Remmert Brewery 0.5 mi (0.8 km) downstream; the flood of Oct. 17, 1870, reached a stage of 37.65 ft (11.476 m) at same site (probably some backwater from Guadalupe River).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,100 ft<sup>3</sup>/s (31.2 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)	Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)
Oct. 24	2000	1,380	39.1	6.14	1.871	Apr. 15	2000	*3,830	108	9.91	3.021
Oct. 29	1300	2,490	70.5	7.96	2.426	Apr. 20	0100	3,560	101	9.53	2.905

Minimum daily discharge, 326 ft<sup>3</sup>/s (9.23 m<sup>3</sup>/s) Sept. 4-6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	360	424	407	407	451	418	402	473	418	390	360	335
2	360	407	402	412	440	418	396	473	418	390	355	330
3	365	407	402	412	451	429	407	468	418	396	355	330
4	357	402	407	412	440	429	412	468	418	390	355	326
5	423	402	446	412	429	418	407	459	418	385	350	326
6	370	396	517	412	429	418	402	451	418	385	350	326
7	375	390	434	429	429	418	402	446	412	385	350	335
8	360	390	412	418	434	418	396	446	407	380	350	355
9	360	396	412	429	434	418	396	446	412	380	345	340
10	365	396	412	418	490	412	402	446	412	385	345	340
11	365	390	429	412	688	412	412	451	412	385	345	335
12	365	396	456	434	484	407	418	442	412	380	340	350
13	370	402	446	544	451	412	442	434	412	375	340	338
14	365	402	446	478	451	412	492	434	407	380	340	340
15	469	396	434	434	446	407	1110	434	407	375	340	350
16	606	396	429	429	440	407	1110	434	407	380	335	340
17	390	429	424	429	440	402	534	434	402	380	335	340
18	380	424	412	429	434	402	456	434	402	380	340	355
19	418	600	429	418	434	396	556	434	396	375	340	345
20	412	462	434	418	434	396	1520	429	396	370	340	350
21	385	412	424	429	440	402	517	440	396	380	340	340
22	380	402	424	478	434	396	471	429	407	370	340	350
23	385	402	424	627	429	396	490	424	412	380	340	345
24	722	402	412	451	429	402	490	424	407	380	340	350
25	551	412	412	440	418	402	490	424	407	375	340	355
26	412	451	412	440	418	402	484	424	412	370	335	345
27	402	424	412	434	418	412	484	418	407	360	335	345
28	432	412	412	429	418	418	478	418	396	365	335	340
29	1330	407	412	429	---	407	478	418	396	360	335	340
30	585	407	412	484	---	402	478	418	396	365	330	340
31	429	---	407	512	---	396	---	418	---	365	335	---
TOTAL	13848	12438	13153	13739	12533	12684	15932	13591	12240	11716	10615	10236
MEAN	447	415	424	443	448	409	531	438	408	378	342	341
MAX	1330	600	517	627	688	429	1520	473	418	396	360	355
MIN	357	390	402	407	418	396	396	418	396	360	330	326
AC-FT	27470	24670	26090	27250	24860	25160	31600	26960	24280	23240	21050	20300
CAL YR 1976	TOTAL	141224	MEAN 386	MAX 2040	MIN 308	AC-FT 280100						
WTR YR 1977	TOTAL	152725	MEAN 418	MAX 1520	MIN 326	AC-FT 302900						

## GUADALUPE RIVER BASIN

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08169580 GUADALUPE RIVER BELOW NEW BRAUNFELS, TX

LOCATION.--Lat 29°40'00", long 98°04'14", Comal County, Hydrologic Unit 12100202, in Lake Dunlap, 8 mi (13 km) southeast of New Braunfels, and 15 mi (24 km) downstream from Interstate Highway 35 bridge.

PERIOD OF RECORD.--Periodic chemical and biochemical analyses: January 1968 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)
OCT									
18...	1100	489	7.6	20.0	8.1	92	.4	230	18
DEC									
14...	1015	526	7.5	16.0	9.1	95	.7	250	30
FEB									
22...	1030	522	8.0	17.0	10.2	109	1.4	270	48
APR									
25...	1000	447	7.5	16.0	8.8	92	1.1	220	30
JUN									
21...	0950	494	7.6	25.0	7.2	89	.9	230	18
AUG									
24...	1130	491	7.7	28.5	13.2	171	4.6	230	21

DATE	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
OCT									
18...	69	15	11	.3	1.8	264	0	17	16
DEC									
14...	72	17	14	.4	1.7	268	0	23	21
FEB									
22...	79	18	14	.4	1.7	272	0	23	21
APR									
25...	60	17	11	.3	1.9	232	0	19	17
JUN									
21...	68	15	12	.3	1.7	260	0	21	21
AUG									
24...	64	16	14	.4	1.5	250	0	21	18

DATE	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)
OCT								
18...	.3	11	271	.99	.01	.05	.21	.04
DEC								
14...	.2	11	292	.95	.01	.05	.17	.04
FEB								
22...	.2	11	302	.98	.01	.05	.15	.03
APR								
25...	.1	11	251	.48	.02	.07	.43	.03
JUN								
21...	.2	10	277	.46	.02	.07	1.0	.03
AUG								
24...	.2	12	270	.73	.03	.16	.57	.09

## GUADALUPE RIVER BASIN

## 08170000 SAN MARCOS RIVER SPRING FLOW AT SAN MARCOS, TX

LOCATION.--Lat 29°52'06", long 97°55'38", Hays County, Hydrologic Unit 12100203, on left bank 0.7 mi (1.1 km) downstream from bridge on Interstate Highway 35 and U.S. Highway 81, 1.2 mi (1.9 km) southeast of courthouse in San Marcos, and 2.1 mi (3.4 km) upstream from Blanco River.

DRAINAGE AREA.--93.0 mi<sup>2</sup> (240.9 km<sup>2</sup>). Normal flow of river comes from springs, drainage area of stream not applicable.

PERIOD OF RECORD.--May 1956 to current year. June 1915 to January 1916, March 1916 to September 1921, and May to September 1956, published as San Marcos River at San Marcos; records include some surface runoff. Periodic measurements of spring flow were made at this location outside periods of record since Nov. 14, 1894, and are published as miscellaneous measurements.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 536.82 ft (163.623 m) above mean sea level. June 10, 1915, to Jan. 19, 1916, nonrecording gage at site 1.2 miles (1.9 km) upstream, and Mar. 13, 1916, to Sept. 7, 1921, water-stage recorder near present site, datum relations unknown.

REMARKS.--Records good. Flow slightly regulated by utilities dam about 1.5 mi (2.4 km) upstream. Entire flow of river is from San Marcos Springs, about 1.8 mi (2.9 km) upstream, except during period of local runoff. Springs emerge from the Edwards and associated limestone in the Balcones Fault Zone. Small diversion for operation of State fish hatchery, some of which is returned above gage. Several observations of water temperatures were made during the year.

AVERAGE DISCHARGE.--21 years (water years 1957-77), 170 ft<sup>3</sup>/s (4.814 m<sup>3</sup>/s), 123,200 acre-ft/yr (152 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily spring discharge, 316 ft<sup>3</sup>/s (8.95 m<sup>3</sup>/s) June 12, 1975; maximum discharge, 76,600 ft<sup>3</sup>/s (2,170 m<sup>3</sup>/s) May 15, 1970, gage height, 35.12 ft (10.705 m); minimum daily spring discharge, 46 ft<sup>3</sup>/s (1.30 m<sup>3</sup>/s) Aug. 15, 16, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1913, 38.6 ft (11.77 m) Sept. 10, 1921 (from floodmark), present datum (backwater from Blanco River).

EXTREMES FOR CURRENT YEAR.--Maximum daily spring discharge, 306 ft<sup>3</sup>/s (8.67 m<sup>3</sup>/s) Feb. 11, 12; maximum gage height, 17.44 ft (5.316 m) Oct. 24 (flood runoff); minimum daily spring discharge, 175 ft<sup>3</sup>/s (4.96 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	205	286	279	282	279	297	264	287	263	231	203	187
2	204	282	279	280	280	298	262	285	260	231	206	186
3	202	282	278	279	283	296	261	284	258	231	204	185
4	203	281	276	277	280	296	259	282	257	231	202	186
5	207	280	278	277	280	296	258	279	255	229	201	185
6	207	280	282	278	279	293	255	279	253	228	200	183
7	203	280	282	277	279	292	251	278	255	228	200	184
8	201	278	279	278	283	291	249	277	254	227	200	184
9	200	278	278	279	281	290	250	277	253	225	200	185
10	198	280	279	276	287	290	248	277	252	224	198	185
11	197	281	285	275	306	291	249	276	251	223	195	186
12	196	282	286	277	306	288	243	275	250	220	192	185
13	196	283	285	278	303	287	245	273	250	218	193	185
14	194	280	287	279	302	286	248	272	249	216	193	185
15	199	279	286	279	301	284	270	272	249	213	190	184
16	222	278	285	276	299	281	271	271	248	211	189	183
17	218	278	285	274	299	282	275	270	245	212	189	185
18	220	277	285	273	300	281	284	269	243	213	191	186
19	221	285	286	272	300	279	290	270	242	214	192	185
20	224	287	285	272	300	278	298	270	240	214	195	185
21	221	282	283	271	299	277	300	271	237	212	193	185
22	221	279	284	271	299	274	302	272	237	212	192	185
23	223	278	283	275	298	272	303	271	239	212	190	183
24	235	278	283	276	297	270	303	271	236	211	188	182
25	250	282	282	276	298	270	303	271	236	209	187	182
26	242	290	281	276	297	271	299	270	237	207	190	181
27	240	285	281	277	297	270	295	269	238	205	190	179
28	243	285	282	275	298	270	293	268	235	205	190	179
29	263	281	281	274	---	271	289	265	233	203	189	176
30	291	280	282	275	---	268	291	263	233	203	186	175
31	292	---	282	276	---	265	---	263	---	204	186	---
TOTAL	6838	8437	8749	8560	8210	8754	8208	8477	7388	6722	6014	5506
MEAN	221	281	282	276	293	282	274	273	246	217	194	184
MAX	292	290	287	282	306	298	303	287	263	231	206	187
MIN	194	277	276	271	279	265	243	263	233	203	186	175
AC-FT	13560	16730	17350	16980	16280	17360	16280	16810	14650	13330	11930	10920
CAL YR 1976	TOTAL	77213	MEAN 211	MAX 292	MIN 121	AC-FT 153200						
WTR YR 1977	TOTAL	91863	MEAN 252	MAX 306	MIN 175	AC-FT 182200						



## 08171000 BLANCO RIVER AT WIMBERLEY, TX

LOCATION.--Lat 29°59'39", Long 98°05'19", Hays County, Hydrologic Unit 12100203, on left bank at downstream side of highway, near left end of bridge on Ranch Road 12; 0.3 mi (0.5 km) southeast of Wimberley, 2,200 ft (671 m) downstream from Cypress Creek, and at mile 29.0 (46.7 km).

DRAINAGE AREA.--355 mi<sup>2</sup> (919 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1924 to September 1926, June 1928 to current year.

REVISED RECORDS.--WSP 1562: 1929, 1930-31(M), 1935-36(M), 1938(M), 1941-42(M), 1947(M), 1949(M). WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 797.23 ft (242.996 m) above mean sea level. Aug. 6, 1924, to Sept. 30, 1926, nonrecording gage at site 1,030 ft (314 m) upstream at datum 5.00 ft (1.524 m) higher. Recording gage June 6, 1928, to June 12, 1975, at site 1,000 ft (305 m) upstream at datum 5.00 ft (1.524 m) higher.

REMARKS.--Water-discharge records good. Numerous small diversions above station. The Geological Survey operates satellite telemeter at station.

AVERAGE DISCHARGE.--51 years (water years 1925-26, 1929-77), 123 ft<sup>3</sup>/s (3.483 m<sup>3</sup>/s), 4.71 in/yr (120 mm/yr), 89,110 acre-ft/yr (110 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 113,000 ft<sup>3</sup>/s (3,200 m<sup>3</sup>/s) May 28, 1929, gage height, 33.9 ft (10.33 m), present site and datum, from floodmarks, from rating curve extended above 30,000 ft<sup>3</sup>/s (850 m<sup>3</sup>/s) on basis of slope-area measurements of 95,000 and 113,000 ft<sup>3</sup>/s (2,690 and 3,200 m<sup>3</sup>/s); minimum, 0.6 ft<sup>3</sup>/s (0.017 m<sup>3</sup>/s) Aug. 16, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1869, that of May 28, 1929; flood in July 1869 reached a stage of 26 ft (7.9 m), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,800 ft<sup>3</sup>/s (51.0 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 15	2300	*11,300 320	12.63 3.850	Apr. 20	0015	6,950 197	10.30 3.139
Apr. 16	1600	7,980 226	10.93 3.331				

Minimum daily discharge, 45 ft<sup>3</sup>/s (1.27 m<sup>3</sup>/s) Sept. 18, 25, 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	451	220	237	262	240	146	569	235	136	68	49
2	97	410	217	244	270	243	148	521	208	134	67	49
3	92	377	213	234	284	261	149	492	220	129	67	52
4	96	349	207	227	287	266	143	470	193	129	67	52
5	576	326	214	219	278	242	133	438	179	114	66	49
6	130	313	261	209	269	228	130	420	176	106	62	54
7	114	292	262	216	269	220	128	399	177	103	62	49
8	106	277	238	212	266	216	128	380	173	101	61	49
9	100	267	233	212	269	215	123	366	164	102	60	52
10	97	255	231	207	281	213	121	358	162	98	61	47
11	94	247	254	200	380	214	120	382	159	96	62	49
12	92	239	307	202	399	204	142	379	156	94	62	49
13	92	257	293	226	364	198	342	332	162	92	58	47
14	92	260	302	282	356	195	395	310	185	94	57	47
15	100	231	332	254	342	191	2770	302	167	92	57	47
16	126	227	320	242	331	185	4680	290	158	92	56	47
17	133	223	317	233	330	182	1980	281	152	87	56	47
18	120	224	317	233	329	182	1440	273	147	87	54	45
19	123	265	323	231	320	178	1300	298	142	86	59	47
20	130	281	327	231	304	171	2510	501	143	85	54	47
21	126	256	310	231	300	170	1440	330	140	83	54	49
22	126	237	303	235	299	159	1190	331	145	82	54	49
23	120	231	299	265	297	150	1030	289	169	80	52	47
24	170	229	286	271	282	152	921	265	168	77	52	47
25	167	229	286	256	273	150	828	252	182	77	54	45
26	163	267	279	252	264	151	754	242	160	76	54	45
27	153	257	269	258	247	160	710	233	150	75	52	47
28	155	239	268	258	243	197	656	224	142	74	52	47
29	544	232	257	249	---	184	618	219	142	75	56	47
30	753	223	255	246	---	160	586	215	137	71	49	47
31	527	---	244	261	---	151	---	213	---	71	49	---
TOTAL	5614	8171	8444	7333	8395	6028	25761	10574	4993	2898	1794	1444
MEAN	181	272	272	237	300	194	859	341	166	93.5	57.9	48.1
MAX	753	451	332	282	399	266	4680	569	235	136	68	54
MIN	92	223	207	200	243	150	120	213	137	71	49	45
CFSM	.51	.77	.77	.67	.85	.55	2.42	.96	.47	.26	.16	.14
IN.	.59	.86	.88	.77	.88	.63	2.70	1.11	.52	.30	.19	.15
AC-FT	11140	16210	16750	14550	16650	11960	51100	20970	9900	5750	3560	2860
CAL YR 1976	TOTAL	82191	MEAN 225	MAX 3550	MIN 57	CFSM .63	IN 8.61	AC-FT 163000				
WTR YR 1977	TOTAL	91449	MEAN 251	MAX 4680	MIN 45	CFSM .71	IN 9.58	AC-FT 181400				



## GUADALUPE RIVER BASIN

08171000 BLANCO RIVER AT WIMBERLEY, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1974 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURES: December 1976 to September 1977.

INSTRUMENTATION.--Water-temperature is recorded continuously at this station.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Where maximum or minimum values are not shown, mean value is estimated.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURES: Maximum, 33.0°C Aug. 23-25.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIO-CHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. / 100 ML)
OCT 12...	1329	92	454	8.0	21.0	0	6	9.5	109	.7	110	41
DEC 13...	1115	300	482	7.9	12.0	0	1	10.4	100	.2	1200	74
FEB 14...	1330	380	493	7.8	15.5	0	2	10.3	106	.4	780	18
APR 11...	1442	130	469	8.1	22.0	0	1	9.7	114	.4	3800	22
JUN 13...	1100	150	458	7.8	27.0	0	1	8.7	110	.5	6800	310
AUG 15...	1306	70	445	8.1	29.5	0	0	8.8	116	.2	4000	81

DATE	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT 12...	28	240	28	68	16	7.4	.2	1.3	253	0	18	12
DEC 13...	86	250	22	72	17	9.7	.3	1.0	278	0	18	15
FEB 14...	75	250	16	75	15	8.0	.2	1.0	284	0	18	12
APR 11...	380	240	34	68	18	8.4	.2	1.3	256	0	20	13
JUN 13...	240	230	27	68	15	8.2	.2	1.2	250	0	28	14
AUG 15...	48	220	29	59	17	8.6	.3	1.2	230	0	28	16

DATE	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SI02) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 12...	.2	9.4	257	10	1	.32	.00	.01	.13	.01	.8
DEC 13...	.2	8.6	279	1	0	.56	.00	.00	.05	.00	1.4
FEB 14...	.2	9.1	278	4	1	.53	.00	.01	.28	.01	1.4
APR 11...	.2	9.0	264	4	0	.52	.01	.02	.16	.00	6.0
JUN 13...	.2	9.1	267	3	1	.45	.01	.13	.00	.34	1.4
AUG 15...	.2	11	254	1	1	.39	.01	.01	.00	.03	1.0

08171000 BLANCO RIVER AT WIMBERLEY, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

				DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)			
		DATE	TIME									
		OCT 12...	1329		0	0	6	0	3	0		
		FEB 14...	1330		0	100	2	0	0	10		
		DATE		DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)			
		OCT 12...		3	10	.1	0	0	30			
		FEB 14...		0	10	.1	1	0	0			
DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
FEB 14...	1330	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
AUG 15...	1306	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
FEB 14...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
AUG 15...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

## TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1									---			8.0
2									---			8.0
3									---			8.5
4									---			10.0
5									---			11.0
6									---			10.0
7									---			11.0
8									---			12.0
9									11.0			11.0
10									12.0			8.0
11									12.5			8.5
12									10.0			9.0
13									12.0			10.0
14									12.5			11.5
15									13.0			10.5
16									12.0			12.0
17									13.0			8.5
18									13.5			9.5
19									14.0			7.5
20									13.0			9.0
21									9.5			11.5
22									8.5			12.5
23									10.5			13.0
24									11.0			12.5
25									11.0			12.0
26									11.5			12.0
27									12.0			14.0
28									13.0			15.0
29									12.0			11.0
30									12.0			8.5
31									11.0			8.5
MONTH									12.0			10.5

GUADALUPE RIVER BASIN  
08171000 BLANCO RIVER AT WIMBERLEY, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1			10.0	---	---	14.5	17.0	16.5	16.5	22.5	19.5	21.0
2			10.5	---	---	16.0	20.5	17.0	18.5	22.0	21.0	21.5
3			11.0	---	---	15.5	22.5	18.5	20.0	22.5	21.5	21.5
4			12.0	---	---	15.0	20.5	18.0	19.5	23.5	21.5	22.5
5			13.0	15.5	13.0	14.5	20.0	16.5	18.0	22.5	21.5	22.0
6			12.0	15.5	12.5	14.0	20.5	16.0	18.0	23.0	21.0	22.0
7			12.0	16.0	12.0	14.0	21.0	16.5	19.0	24.0	22.0	22.5
8			12.5	16.5	12.5	14.5	21.5	17.5	19.5	23.5	22.0	22.5
9			12.5	15.5	14.0	15.0	22.0	18.5	20.0	23.5	22.0	22.5
10			13.0	17.0	15.0	15.5	21.5	18.0	19.5	24.0	21.5	22.5
11			13.5	18.0	16.0	17.0	21.5	18.5	20.0	22.0	20.5	21.5
12			14.0	17.5	15.0	16.0	22.0	19.0	20.5	23.0	20.0	21.5
13			13.0	18.5	14.5	16.5	21.0	19.0	20.0	23.5	21.0	22.0
14			13.5	19.0	15.5	17.0	20.0	19.0	19.0	23.0	21.0	21.5
15			14.0	21.0	17.5	19.0	19.5	16.0	18.0	23.0	21.5	22.0
16			13.0	20.0	17.5	19.0	16.5	15.5	16.0	22.0	21.5	21.5
17			13.5	20.5	19.0	19.5	18.5	16.5	17.5	21.5	21.0	21.0
18			14.5	20.5	18.5	19.5	20.5	17.5	19.0	22.0	21.0	21.0
19			15.5	20.0	17.5	18.5	22.0	20.0	20.5	23.0	21.0	21.5
20			13.5	18.5	16.0	17.5	21.0	19.5	20.0	23.0	21.5	22.0
21			14.0	18.0	16.5	17.5	20.5	19.5	20.0	24.5	21.0	23.0
22			15.0	18.0	15.5	16.5	20.5	18.0	19.5	24.0	22.0	23.0
23			17.0	17.0	15.0	16.0	20.5	18.5	19.5	25.0	22.0	23.5
24			14.5	16.0	15.5	16.0	21.0	18.5	20.0	25.0	22.5	23.5
25			16.5	17.0	16.0	16.5	21.0	19.0	20.0	25.5	22.5	24.0
26			17.0	18.0	17.0	17.5	21.0	18.5	20.0	26.0	23.0	24.5
27			12.0	19.0	17.5	18.5	22.0	19.5	20.5	26.5	23.5	24.5
28			13.0	20.0	16.0	18.0	22.0	20.0	21.0	24.5	24.0	24.0
29			---	21.5	17.0	19.0	21.5	20.5	21.0	24.0	23.0	23.5
30			---	21.0	18.5	20.0	21.0	20.0	20.5	25.5	22.5	24.0
31			---	19.0	17.0	18.0	---	---	---	26.5	23.5	24.5
MONTH			13.5	21.5	12.0	17.0	22.5	15.5	19.5	26.5	19.5	22.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	24.5	23.0	23.5	29.5	25.5	27.5	32.0	27.0	29.0	29.5	26.0	27.5
2	26.5	21.5	24.0	29.5	25.5	27.5	32.0	27.0	29.0	30.5	25.5	27.5
3	27.0	23.0	25.0	29.5	25.5	27.5	30.5	26.5	28.5	31.0	26.0	28.0
4	28.0	24.0	25.5	29.5	25.5	27.5	31.5	26.5	28.5	30.5	25.0	27.0
5	27.0	23.5	25.0	29.5	25.5	27.5	30.5	27.0	28.5	30.0	25.0	27.5
6	27.0	23.5	25.0	29.5	25.5	27.5	31.0	26.5	28.5	29.5	25.5	27.0
7	27.5	23.5	25.5	29.5	25.5	27.5	30.5	27.0	28.5	29.0	26.0	27.0
8	27.0	23.5	25.5	30.0	25.5	28.0	31.0	26.5	28.5	29.5	25.5	27.0
9	28.5	24.5	26.5	30.0	25.5	28.0	31.0	26.5	28.5	30.0	25.5	27.5
10	28.5	25.0	26.5	29.5	26.0	27.5	30.5	27.0	28.5	31.5	26.5	28.5
11	28.5	25.0	26.5	30.0	25.5	27.5	31.5	26.5	29.0	31.0	27.0	29.0
12	28.5	25.0	27.0	30.0	25.5	27.5	30.0	26.5	28.5	29.5	26.5	28.0
13	29.0	25.0	27.0	30.5	25.5	28.0	30.0	26.0	28.0	29.5	25.5	27.0
14	27.0	25.0	26.0	30.0	25.5	28.0	32.0	26.5	28.5	29.5	25.0	26.5
15	27.5	24.5	26.0	30.5	26.0	28.0	31.5	27.0	29.0	29.5	24.5	26.5
16	28.5	25.0	26.5	30.0	26.0	28.0	32.0	26.5	29.0	29.5	25.5	27.0
17	29.0	25.0	26.5	30.0	25.5	27.5	32.5	27.0	29.5	29.5	25.5	27.0
18	29.5	25.0	27.0	29.0	26.0	27.5	30.0	27.5	28.5	30.0	26.0	27.5
19	29.0	25.5	27.0	29.0	19.0	27.0	31.0	26.5	29.0	31.0	25.5	27.5
20	29.0	25.5	27.0	29.0	26.0	27.5	32.0	27.0	29.0	30.0	24.5	27.0
21	29.0	25.5	27.0	30.0	26.0	27.5	32.0	27.5	29.5	30.0	25.0	27.0
22	28.5	25.0	26.5	31.0	26.0	28.5	32.5	28.0	29.5	30.0	25.5	27.0
23	25.5	24.0	25.0	31.0	26.5	28.5	33.0	28.0	30.0	29.0	26.0	27.0
24	26.5	23.5	25.0	31.5	26.5	29.0	33.0	28.5	30.5	30.5	26.0	27.5
25	28.5	24.5	26.0	31.5	19.0	28.5	33.0	28.5	30.0	30.5	26.5	28.0
26	29.0	25.0	27.0	31.5	26.5	29.0	32.0	27.5	29.5	31.0	27.0	28.5
27	29.5	25.5	27.5	31.5	26.5	28.5	31.0	27.5	28.5	31.5	26.5	28.5
28	29.0	25.5	27.0	29.5	27.0	28.0	29.0	27.0	28.0	31.0	27.0	28.5
29	29.0	25.5	27.0	30.0	19.0	27.5	30.5	26.5	28.0	30.5	26.0	28.0
30	28.5	25.5	27.0	31.0	26.5	28.5	30.0	27.0	28.0	30.5	26.0	28.0
31	---	---	---	31.5	26.5	29.0	30.0	26.5	28.0	---	---	---
MONTH	29.5	21.5	26.0	31.5	19.0	28.0	33.0	26.0	29.0	31.5	24.5	27.5

## 08171300 BLANCO RIVER NEAR KYLE, TX

LOCATION.--Lat 29°58'45", long 97°54'35", Hays County, Hydrologic Unit 12100203, on left bank 800 ft (240 m) downstream from Tarbutton Ranch House (Hatchett Ranch), 2.2 mi (3.5 km) southwest of Kyle, 4.2 mi (6.8 km) downstream from Halifax Creek, and 6.3 mi (10.1 km) upstream from bridge on U.S. Highway 81.

DRAINAGE AREA.--412 mi<sup>2</sup> (1,067 km<sup>2</sup>).

PERIOD OF RECORD.--May 1956 to current year.

REVISED RECORDS.--WSP 1923: 1957-58, 1960(M). WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 620.12 ft (189.013 m) above mean sea level, Corps of Engineers bench mark.

REMARKS.--Records good. Small diversions above station for irrigation. Most of the low flow of the Blanco River enters the Edwards and associated limestones in the Balcones Fault Zone which crosses the basin upstream from this station and below the station at Wimberley. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--21 years (water years 1957-77), 158 ft<sup>3</sup>/s (4.475 m<sup>3</sup>/s), 5.21 in/yr (132 mm/yr), 114,500 acre-ft/yr (141 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 98,000 ft<sup>3</sup>/s (2,780 m<sup>3</sup>/s) May 2, 1958, gage height, 36.3 ft (11.06 m), from floodmark, from rating curve extended above 37,000 ft<sup>3</sup>/s (1,050 m<sup>3</sup>/s) on basis of slope-area measurement of 139,000 ft<sup>3</sup>/s (3,940 m<sup>3</sup>/s) and slope-conveyance study; no flow at times in 1956-57, 1963-65, 1967, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1882, about 40 ft (12.2 m) in May 1929, from information by local residents, discharge, 139,000 ft<sup>3</sup>/s (3,940 m<sup>3</sup>/s). Flood of Sept. 11, 1952, reached a stage of 38.0 ft (11.58 m), discharge, 115,000 ft<sup>3</sup>/s (3,260 m<sup>3</sup>/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft<sup>3</sup>/s (42.5 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 16	0200	*13,200 374	18.21 5.550	Apr. 20	0345	5,730 162	13.88 4.231
Apr. 16	1900	8,860 251	15.97 4.868				

Minimum discharge, 22 ft<sup>3</sup>/s (0.62 m<sup>3</sup>/s) Sept. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	473	223	235	250	239	146	593	238	92	49	29
2	61	418	220	240	254	240	149	555	210	88	48	29
3	59	376	214	236	255	244	146	528	200	85	48	29
4	60	339	211	228	257	284	144	504	190	82	47	28
5	333	308	224	220	263	251	133	475	180	80	46	28
6	133	286	265	212	267	231	125	453	170	77	45	33
7	83	268	287	213	266	220	121	432	165	76	44	34
8	77	249	256	209	265	212	122	412	160	74	43	35
9	68	239	246	207	264	208	121	394	155	72	42	33
10	67	233	247	199	265	206	117	381	150	71	42	31
11	64	225	263	191	293	206	116	380	150	69	43	30
12	62	212	268	197	351	196	114	407	145	68	42	29
13	61	234	270	218	370	187	171	352	146	66	41	31
14	60	250	272	271	374	185	409	327	150	65	40	32
15	71	234	296	264	373	182	1170	317	145	65	40	30
16	100	220	303	239	360	175	6320	305	137	63	39	29
17	94	214	306	227	354	171	2430	296	133	63	38	28
18	95	206	308	225	346	170	1550	292	128	62	36	28
19	96	249	310	222	336	166	1250	295	124	62	40	28
20	107	287	313	222	321	157	2780	517	120	60	36	27
21	98	256	315	221	314	155	1700	360	115	59	35	26
22	98	233	313	226	312	150	1340	350	115	58	35	26
23	98	225	309	230	307	148	1120	304	120	57	35	26
24	302	223	300	234	287	150	987	280	115	56	33	26
25	182	227	299	237	275	151	891	262	120	55	33	25
26	154	250	287	241	269	157	811	250	115	54	32	24
27	137	267	274	244	255	166	745	240	110	53	32	24
28	133	238	271	245	245	190	688	229	105	52	33	23
29	564	228	259	237	---	196	646	224	100	53	32	23
30	896	224	253	243	---	165	619	220	96	51	33	23
31	583	---	243	249	---	149	---	219	---	50	29	---
TOTAL	5060	7891	8425	7082	8348	5907	27181	11153	4307	2038	1211	847
MEAN	163	263	272	228	298	191	906	360	144	65.7	39.1	28.2
MAX	896	473	315	271	374	284	6320	593	238	92	49	35
MIN	59	206	211	191	245	148	114	219	96	50	29	23
CFSM	.40	.64	.66	.55	.72	.46	2.20	.87	.35	.16	.10	.07
IN.	.46	.71	.76	.64	.75	.53	2.45	1.01	.39	.18	.11	.08
AC-FT	10040	15650	16710	14050	16560	11720	53910	22120	8540	4040	2400	1680
CAL YR 1976	TOTAL	80780	MEAN 221	MAX 4360	MIN 28	CFSM .54	IN 7.29	AC-FT 160200				
WTR YR 1977	TOTAL	89450	MEAN 245	MAX 6320	MIN 23	CFSM .60	IN 8.08	AC-FT 177400				

## GUADALUPE RIVER BASIN

08172000 SAN MARCOS RIVER AT LULING, TX

LOCATION.--Lat 29°39'54", long 97°38'59", Caldwell-Guadalupe County line, Hydrologic Unit 12100203, on left bank 390 ft (119 m) downstream from bridge on State Highway 80, 1.0 mi (1.6 km) south of U.S. Post Office at Luling, and 9.4 mi (15.1 km) upstream from Plum Creek.

DRAINAGE AREA.--838 mi<sup>2</sup> (2,170 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1939 to current year.

REVISED RECORDS.--WSP 958: 1940. WSP 1312: 1940(M), 1945(M), 1947(M). WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 322.05 ft (98.161 m) above mean sea level.

REMARKS.--Water-discharge records good. Flow is affected at times by discharge from flood-detention pools of 17 floodwater-retarding structures with combined detention capacity of 18,250 acre-ft (22.5 hm<sup>3</sup>). These structures control runoff from 71.3 mi<sup>2</sup> (184.7 km<sup>2</sup>) in the Town Creek and York Creek drainage basins.

AVERAGE DISCHARGE.--38 years, 373 ft<sup>3</sup>/s (10.56 m<sup>3</sup>/s), 270,200 acre-ft/yr (333 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 57,000 ft<sup>3</sup>/s (1,610 m<sup>3</sup>/s) Sept. 12, 1952, gage height, 34.95 ft (10.653 m); minimum daily, 43 ft<sup>3</sup>/s (1.22 m<sup>3</sup>/s) Aug. 12, 1951.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1859, 40.4 ft (12.31 m) in 1869 or 1870, from information by State Highway Department. Flood of May 29, 1929, reached a stage of 37.1 ft (11.31 m) and is the second highest known.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,900 ft<sup>3</sup>/s (82.1 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 16	0800	5,030 142	24.39 7.434	Feb. 12	0100	3,960 112	22.16 6.754
Oct. 25	0400	5,700 161	25.39 7.739	Apr. 16	2200	11,200 317	29.31 8.934
Oct. 29	2200	6,570 186	26.38 8.041	Apr. 20	1100	*16,500 467	30.83 9.397
Nov. 26	0600	4,390 124	23.19 7.068				

Minimum discharge, 185 ft<sup>3</sup>/s (5.24 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	300	1330	729	674	825	674	514	1120	588	385	272	203
2	298	1170	709	680	766	669	510	1080	592	375	261	201
3	293	1060	693	696	868	678	509	1040	579	370	257	201
4	295	962	680	692	862	709	511	1000	567	365	253	200
5	636	880	851	676	776	716	496	967	549	362	249	201
6	532	819	1840	672	731	681	478	930	525	355	248	212
7	425	778	1100	664	705	653	464	897	510	350	249	204
8	346	743	887	654	699	635	455	869	502	347	247	218
9	322	717	797	661	710	626	453	937	497	344	242	210
10	308	701	764	648	774	622	450	1220	487	338	235	211
11	300	694	893	630	2500	622	445	989	480	335	233	213
12	294	677	921	633	2450	614	442	878	642	330	229	218
13	290	694	944	840	1290	604	444	865	895	324	226	224
14	289	701	1380	1120	1140	595	497	803	514	325	226	231
15	857	700	1070	886	1040	586	861	767	495	323	224	218
16	3670	679	954	785	955	576	5380	746	504	318	223	209
17	774	722	889	710	894	568	7380	724	477	317	220	203
18	536	742	856	676	858	563	3320	704	454	314	217	202
19	763	1430	847	655	832	554	2080	693	442	312	221	202
20	1010	1510	893	643	809	545	10100	955	430	309	219	210
21	536	1030	870	636	785	537	5400	1080	419	306	221	210
22	451	857	825	645	773	526	2530	993	427	301	218	205
23	418	761	797	1070	767	519	2050	857	444	296	213	201
24	2230	720	780	1070	752	516	1800	775	496	292	210	201
25	3350	1050	780	854	733	518	1600	719	482	289	209	199
26	751	3140	769	759	713	527	1460	677	457	281	204	198
27	694	1150	750	719	698	549	1360	647	446	275	207	195
28	622	920	731	697	683	561	1260	626	422	274	211	189
29	3950	826	719	668	---	553	1190	615	404	273	211	187
30	3980	760	705	708	---	567	1140	602	392	270	208	185
31	1670	---	687	1090	---	529	---	590	---	270	204	---
TOTAL	31190	28923	27110	23211	26388	18392	55579	26365	15118	9925	7067	6161
MEAN	1006	964	875	749	942	593	1853	850	504	320	228	205
MAX	3980	3140	1840	1120	2500	716	10100	1220	895	385	272	231
MIN	289	677	680	630	683	516	442	590	392	270	204	185
AC-FT	61870	57370	53770	46040	52340	36480	110200	52290	29990	19690	14020	12220
CAL YR 1976	TOTAL	249868	MEAN 683	MAX 6810	MIN 168	AC-FT 495600						
WTR YR 1977	TOTAL	275429	MEAN 755	MAX 10100	MIN 185	AC-FT 546300						

## GUADALUPE RIVER BASIN

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08172000 SAN MARCOS RIVER AT LULING, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: September 1961 to April 1966, October 1968 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 26...	1820	874	453	7.8	18.0	180	40	56	9.3	23
DEC 07...	1730	1040	618	8.0	13.0	260	56	80	14	28
JAN 17...	1500	668	668	8.3	12.0	290	51	86	18	28
FEB 28...	1500	673	679	7.7	18.5	300	53	86	20	28
APR 11...	1315	441	674	7.8	22.0	300	49	87	19	26
JUN 01...	1340	602	605	7.9	26.0	260	42	76	18	23
JUL 05...	1415	362	587	7.7	27.5	250	38	71	18	23
AUG 15...	1300	224	608	7.9	28.5	270	47	76	19	23

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 26...	.8	4.1	168	0	36	32	.0	13	256
DEC 07...	.8	3.7	246	0	44	44	.0	12	347
JAN 17...	.7	2.2	290	0	43	47	.2	11	378
FEB 28...	.7	1.8	298	0	36	47	.2	10	376
APR 11...	.7	1.7	300	0	35	41	.2	9.9	368
JUN 01...	.6	1.7	270	0	36	42	.2	10	340
JUL 05...	.6	1.7	260	0	31	39	.2	10	322
AUG 15...	.6	1.7	270	0	32	36	.2	12	333



## 08172400 PLUM CREEK AT LOCKHART, TX

LOCATION.--Lat 29°55'22", long 97°40'44". Caldwell County, Hydrologic Unit 12100203, on right bank 548 ft (167 m) upstream from bridge on U.S. Highway 183, 2.7 mi (4.3 km) north of Lockhart, 3.7 mi (6.0 km) upstream from Town Creek, 5.0 mi (8.0 km) downstream from Brushy Creek and 30.4 mi (48.9 km) upstream from mouth.

DRAINAGE AREA.--112 mi<sup>2</sup> (290 km<sup>2</sup>).

PERIOD OF RECORD.--April 1959 to current year.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 431.19 ft (131.427 m) above mean sea level. Apr. 30, 1959, to July 25, 1968, at site 548 ft (167 m) downstream at present datum.

REMARKS.--Records good. No known diversion above station. Flow at times is affected by discharge from the flood detention pools of 17 floodwater-retarding structures with combined detention capacity of 24,850 acre-ft (30.6 hm<sup>3</sup>). These structures control runoff from 67.8 mi<sup>2</sup> (175.6 km<sup>2</sup>) above this station. Several observations of water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,600 ft<sup>3</sup>/s (753 m<sup>3</sup>/s) Oct. 29, 1960, gage height, 20.62 ft (6.285 m); no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1905. 22 ft (6.7 m) in June 1936 at present site; flood in 1951 reached a stage of 20 ft (6.1 m) at present site, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,000 ft<sup>3</sup>/s (56.6 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 24	1700	2,000 56.6	14.49 4.417	Apr. 16	1530	*3,560 101	15.54 4.737
Oct. 29	1530	3,060 86.7	15.32 4.670	Apr. 20	0500	2,120 60.0	14.62 4.456
Feb. 11	1830	2,810 79.6	15.16 4.621	June 12	1330	2,260 64.0	14.76 4.499

Minimum discharge, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	341	47	18	70	23	7.6	23	3.4	.75	.00	.00
2	.02	219	40	18	61	20	7.3	21	4.3	.60	.00	.00
3	.01	150	35	23	97	20	8.0	19	3.6	.46	.00	.00
4	.15	101	31	24	80	34	7.0	17	2.8	.32	.00	.00
5	140	68	102	24	64	30	6.6	15	2.1	.23	.00	.00
6	41	49	320	23	51	22	5.4	14	1.6	.19	.00	.00
7	15	38	196	23	44	18	4.5	15	1.3	.13	.00	.00
8	8.2	32	100	21	39	15	4.0	19	1.2	.09	.00	.00
9	5.1	27	67	25	35	14	3.9	18	.91	.07	.00	.00
10	3.6	25	54	26	143	13	3.7	15	.87	.06	.00	.00
11	2.5	24	221	21	1700	13	3.5	9.6	.86	.04	.00	.00
12	1.8	21	225	25	807	12	3.3	8.8	577	.02	.00	.00
13	1.4	32	166	142	492	11	3.1	7.7	55	.00	.00	.00
14	.86	33	180	206	378	9.6	3.8	6.8	32	.00	.00	.00
15	41	28	121	111	275	9.6	131	6.3	25	.00	.00	.00
16	422	24	88	75	180	9.1	1720	6.1	23	.00	.00	.00
17	103	47	68	55	135	9.0	640	5.8	19	.00	.00	.00
18	44	43	56	44	108	8.5	385	5.3	15	.00	.00	.00
19	121	418	60	36	87	8.0	267	5.5	11	.00	.00	.00
20	133	344	81	31	68	7.0	1700	10	6.0	.00	.00	.00
21	49	167	54	29	56	6.3	564	14	3.9	.00	.00	.00
22	28	89	43	30	51	5.6	346	13	2.6	.00	.00	.00
23	19	59	38	252	48	5.1	223	9.2	3.6	.00	.00	.00
24	1110	45	33	165	41	5.1	151	6.6	6.4	.00	.00	.00
25	626	134	32	94	36	5.7	112	5.2	6.8	.00	.00	.00
26	349	615	29	69	32	6.7	80	4.3	4.4	.00	.00	.00
27	188	216	26	57	28	11	55	3.8	2.7	.00	.00	.00
28	105	116	24	47	25	16	40	3.4	1.8	.00	.00	.00
29	1870	77	22	38	---	14	30	3.0	1.3	.00	.00	.00
30	841	56	21	40	---	11	24	2.7	1.0	.00	.00	.00
31	465	---	19	99	---	8.7	---	2.5	---	.00	.00	---
TOTAL	6733.67	3638	2599	1891	5231	401.0	6539.7	315.6	820.44	2.96	.00	.00
MEAN	217	121	83.8	61.0	187	12.9	218	10.2	27.3	.095	.000	.000
MAX	1870	615	320	252	1700	34	1720	23	577	.75	.00	.00
MIN	.01	21	19	18	25	5.1	3.1	2.5	.86	.00	.00	.00
AC-FT	13360	7220	5160	3750	10380	795	12970	626	1630	5.9	.00	.00
CAL YR 1976	TOTAL	41247.39	MEAN	113	MAX	2530	MIN	.00	AC-FT	81810		
WTR YR 1977	TOTAL	28172.37	MEAN	77.2	MAX	1870	MIN	.00	AC-FT	55880		

LOCATION (revised).--Lat 29°41'58", long 97°36'12", Caldwell County, Hydrologic Unit 12100203, near left bank on downstream side of pier of bridge on county road, 1.2 mi (1.9 km) upstream from West Fork, 1.9 mi (3.1 km) upstream from Southern Pacific Railroad Co. bridge, 2.2 mi (3.5 km) upstream from McNeil Creek, 2.9 mi (4.7 km) northeast of Luling, and at mile 7.5 (12.1 km).

WATER-DISCHARGE RECORDS

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,300 ft<sup>3</sup>/s (65.1 m<sup>3</sup>/s) and maximum (\*):

Minimum discharge, 7.8 ft<sup>3</sup>/s (0.22 m<sup>3</sup>/s) Aug. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.7	708	157	75	215	65	45	159	33	37	12	9.2
2	11	431	138	75	159	62	42	145	39	34	11	8.8
3	9.3	290	124	85	187	61	41	135	36	33	11	8.7
4	9.7	218	109	89	217	72	40	126	31	29	10	8.9
5	315	175	190	91	165	80	36	118	28	28	11	8.8
6	174	144	2020	92	136	70	33	111	26	27	11	8.5
7	70	124	1250	100	121	60	32	104	25	26	11	11
8	38	112	401	93	113	55	29	100	24	25	11	12
9	26	102	219	94	109	53	29	114	23	23	10	11
10	22	96	171	94	132	53	28	460	22	21	10	11
11	19	92	501	86	1780	54	27	169	22	20	10	10
12	17	86	713	83	3230	54	26	106	605	19	10	10
13	15	100	446	158	1200	53	26	83	1310	18	11	14
14	14	117	817	522	652	52	36	72	141	17	12	19
15	309	103	598	296	486	54	103	65	135	16	11	14
16	2500	95	301	175	344	54	2680	62	196	16	10	11
17	853	100	212	139	244	52	4840	59	95	16	10	9.8
18	190	128	174	119	197	52	1570	56	72	17	10	9.7
19	292	496	158	107	169	50	746	53	61	16	9.7	9.6
20	724	1160	180	97	145	46	9530	63	52	16	10	46
21	226	507	169	91	126	44	4470	84	44	15	9.7	18
22	137	240	140	91	115	41	1400	106	48	15	9.3	12
23	102	171	127	326	110	38	774	71	56	14	9.2	11
24	998	142	119	503	98	38	560	58	178	14	9.5	9.9
25	2840	408	115	239	89	40	459	50	98	13	8.7	9.7
26	1090	4300	113	168	82	42	381	45	64	12	8.7	9.4
27	429	2170	104	141	74	53	291	43	50	12	11	9.2
28	240	569	97	124	68	62	218	41	44	12	11	8.7
29	1900	312	89	108	---	60	176	39	39	12	10	8.7
30	4300	194	85	106	---	52	158	38	38	12	10	8.7
31	1760	---	80	329	---	43	---	35	---	12	9.4	---
TOTAL	19639.7	13890	10117	4896	10763	1665	28826	2970	3635	597	318.2	356.3
MEAN	634	463	326	158	384	53.7	961	95.8	121	19.3	10.3	11.9
MAX	4300	4300	2020	522	3230	80	9530	460	1310	37	12	46
MIN	9.3	86	80	75	68	38	26	35	22	12	8.7	8.5
AC-FT	38960	27550	20070	9710	21350	3300	57180	5890	7210	1180	631	707
CAL YR	1976	TOTAL	125972.5	MEAN	344	MAX	5690	MIN	6.4	AC-FT	249900	
WTR YR	1977	TOTAL	97673.2	MEAN	268	MAX	9530	MIN	8.5	AC-FT	193700	

## GUADALUPE RIVER BASIN

08173000 PLUM CREEK NEAR LULING, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1967 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to current year.

WATER TEMPERATURES: October 1967 to current year.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 6,210 micromhos Feb. 27, 1977; minimum daily, 148 micromhos Dec. 1, 1968.

WATER TEMPERATURES: Maximum daily, 35.0°C July 24, 1969; minimum daily, 4.0°C Jan. 4, 1968.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 6,210 micromhos Feb. 27; minimum daily, 188 micromhos Oct. 30.

WATER TEMPERATURES: Maximum daily, 30.0°C July 27, Aug. 1, 10; minimum daily, 9.0°C Jan. 10.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS-CHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 31...	1000	1300	233	7.9	16.0	87	5	31	2.4	9.5
NOV 30...	1500	350	709	8.6	14.0	220	66	72	9.1	54
DEC 07...	1545	1010	404	7.8	10.0	140	33	49	5.0	23
FEB 28...	1150	69	1320	7.4	14.0	420	170	140	17	120
MAR 31...	0820	43	1430	8.1	18.0	440	170	150	16	140
APR 30...	0900	150	688	7.8	22.0	210	70	71	7.7	55
JUN 30...	1800	40	1210	7.9	28.0	360	130	130	8.8	130
AUG 15...	0900	10	1340	8.0	27.0	410	120	130	20	140
SEP 30...	0800	8.7	1370	8.2	24.0	400	120	140	13	140

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 31...	.4	5.0	100	0	16	11	.3	12	137
NOV 30...	1.6	5.4	168	8	71	88	.2	14	405
DEC 07...	.8	7.0	134	0	35	34	.3	13	232
FEB 28...	2.6	6.0	302	0	150	190	.4	12	784
MAR 31...	2.9	3.4	330	0	160	220	.5	14	867
APR 30...	1.7	4.2	170	0	70	79	.3	10	381
JUN 30...	3.0	3.7	280	0	120	240	.5	17	788
AUG 15...	3.0	3.9	350	0	130	190	.5	21	808
SEP 30...	3.0	5.0	340	0	110	210	.5	22	808

08173000 PLUM CREEK NEAR LULING, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	19639.69	321	180	9570	27	1440	31	1670	110
NOV. 1976.....	13890	550	320	11900	61	2280	54	2020	170
DEC. 1976.....	10117	573	330	8990	65	1780	56	1530	180
JAN. 1977.....	4896	1060	620	8160	150	2050	100	1370	320
FEB. 1977.....	10763	839	490	14200	110	3340	82	2380	250
MAR. 1977.....	1665	1340	790	3540	210	927	130	590	400
APR. 1977.....	28826	452	260	20100	44	3430	44	3430	140
MAY 1977.....	2970	1050	610	4920	150	1230	100	818	310
JUNE 1977.....	3635	791	460	4500	110	1040	78	763	240
JULY 1977.....	597	1240	730	1170	190	304	120	196	370
AUG. 1977.....	318.2	1430	840	722	220	192	140	120	420
SEPT 1977.....	356.3	1370	810	778	210	205	140	130	410
TOTAL .....	97673.12	**	**	88500	**	18200	**	15000	**
WTD.AVG. ....	267.6	583	340	**	68	**	57	**	180

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	936	371	831	418	705	786	1390	742	1580	1180	1460	1290
2	941	523	978	625	1270	1440	1660	759	1410	974	1450	1300
3	1490	509	413	835	886	1090	1470	689	598	1020	1480	1310
4	1130	568	978	1430	3180	1340	1390	793	1430	974	1450	1320
5	650	859	706	1460	1060	1260	1490	535	442	1320	1410	1310
6	505	734	346	1130	900	1220	1510	556	1430	1300	1430	1300
7	525	748	498	514	743	1380	1530	868	1260	1320	1530	1800
8	1280	879	480	1460	1290	1320	1530	1380	1530	1450	1400	1300
9	753	1250	590	1000	1350	1530	1550	958	1160	1340	1470	1250
10	4660	1000	407	1390	1070	1050	1960	1550	1360	1380	1350	1330
11	965	1010	514	965	1240	1560	1590	622	1630	873	1400	1360
12	1010	695	646	1150	395	909	1580	793	923	1430	1310	1310
13	1350	451	443	1100	391	948	1590	1550	445	1340	1520	1280
14	732	261	355	725	554	1610	2320	1530	983	1580	1320	1220
15	550	1130	599	1390	615	1720	470	1070	763	1500	1370	1350
16	252	643	484	1330	1240	1590	531	1120	511	1520	2350	1480
17	348	520	850	1060	798	1650	400	1170	774	1420	1350	1330
18	439	1610	590	661	1240	1290	421	1190	1060	1490	1490	1500
19	1230	817	579	1230	953	1570	474	1260	958	780	1500	1310
20	342	419	1010	1330	523	1240	351	780	979	1510	1270	1370
21	436	343	991	1390	1070	1650	290	1150	1020	966	1370	1080
22	667	606	604	1480	1140	1630	234	1160	1410	764	1570	1380
23	689	710	1130	555	1180	1530	1570	1080	846	321	1280	1160
24	383	815	493	740	1290	1340	502	261	1390	1460	1370	1130
25	276	917	908	881	1220	1640	461	1150	804	1470	1240	1120
26	345	500	1410	1150	1290	1220	1590	950	975	1680	1370	1350
27	918	467	1330	831	6210	393	544	1260	1080	1460	1350	1320
28	368	408	435	1200	1320	1570	372	1640	1260	1450	1330	3720
29	220	625	1390	4720	---	1640	1300	1640	1190	1520	1470	1230
30	188	718	1410	689	---	1410	688	1360	1220	809	1350	1380
31	228	---	1460	969	---	1410	---	1410	---	1470	1300	---
MEAN	800	704	770	1160	1250	1350	1090	1060	1080	1260	1430	1400

GUADALUPE RIVER BASIN  
08173000 PLUM CREEK NEAR LULING, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29.0	19.0	12.0	14.0	12.0	15.0	18.0	20.0	26.0	28.0	30.0	24.0
2	29.0	20.0	14.0	---	14.0	18.0	17.0	28.0	27.0	24.0	29.0	29.0
3	27.0	19.0	15.0	14.0	14.0	18.0	19.0	20.0	27.0	28.0	29.0	27.0
4	29.0	19.0	10.0	13.0	14.0	15.0	18.0	20.0	27.0	29.0	29.0	24.0
5	24.0	20.0	14.0	14.0	12.0	14.0	20.0	22.0	27.0	28.0	24.0	24.0
6	24.0	19.0	15.0	14.0	14.0	15.0	21.0	25.0	28.0	24.0	24.0	24.0
7	20.0	17.0	15.0	15.0	15.0	17.0	21.0	25.0	27.0	24.0	24.0	24.0
8	21.0	18.0	14.0	15.0	14.0	18.0	21.0	25.0	25.0	24.0	27.0	25.0
9	19.0	18.0	15.0	12.0	12.0	16.0	20.0	25.0	27.0	25.0	27.0	24.0
10	21.0	19.0	15.0	9.0	12.0	18.0	21.0	22.0	27.0	25.0	30.0	24.0
11	20.0	17.0	14.0	12.0	15.0	16.0	20.0	25.0	24.0	29.0	27.0	24.0
12	20.0	17.0	14.0	14.0	14.0	17.0	18.0	24.0	23.0	28.0	29.0	27.0
13	21.0	15.0	11.0	14.0	15.0	16.0	20.0	24.0	28.0	28.0	29.0	24.0
14	21.0	14.0	14.0	12.0	15.0	18.0	18.0	24.0	26.0	27.0	24.0	27.0
15	19.0	14.0	14.0	14.0	13.0	19.0	18.0	22.0	24.0	25.0	29.0	24.0
16	18.0	14.0	14.0	12.0	14.0	20.0	18.0	25.0	28.0	24.0	24.0	29.0
17	18.0	14.0	15.0	10.0	15.0	20.0	---	22.0	28.0	24.0	29.0	29.0
18	20.0	15.0	14.0	10.0	16.0	18.0	20.0	22.0	27.0	26.0	24.0	24.0
19	19.0	14.0	14.0	12.0	14.0	18.0	21.0	24.0	27.0	24.0	29.0	28.0
20	18.0	16.0	14.0	12.0	14.0	18.0	18.0	24.0	28.0	28.0	29.0	24.0
21	18.0	16.0	12.0	14.0	17.0	19.0	20.0	25.0	27.0	24.0	24.0	27.0
22	20.0	15.0	12.0	12.0	14.0	18.0	20.0	22.0	24.0	24.0	24.0	24.0
23	18.0	---	14.0	12.0	20.0	16.0	21.0	24.0	26.0	24.0	29.0	25.0
24	18.0	---	14.0	14.0	20.0	18.0	22.0	25.0	24.0	24.0	27.0	27.0
25	17.0	15.0	15.0	14.0	20.0	17.0	24.0	25.0	28.0	28.0	29.0	24.0
26	18.0	---	15.0	14.0	18.0	18.0	18.0	23.0	24.0	29.0	24.0	24.0
27	18.0	13.0	14.0	15.0	14.0	18.0	22.0	25.0	25.0	30.0	29.0	25.0
28	18.0	12.0	15.0	15.0	14.0	18.0	24.0	22.0	28.0	28.0	25.0	25.0
29	---	12.0	14.0	12.0	---	20.0	24.0	22.0	28.0	28.0	24.0	24.0
30	17.0	14.0	14.0	12.0	---	20.0	22.0	26.0	28.0	24.0	24.0	24.0
31	16.0	---	12.0	10.0	---	18.0	---	26.0	---	24.0	27.0	---
MEAN	20.5	16.0	14.0	13.0	15.0	17.5	20.0	23.5	26.5	26.0	27.0	25.5

## 08174600 PEACK CREEK BELOW DILLWORTH, TX

LOCATION.--Lat 29°28'26", long 97°18'59", Gonzales County, Hydrologic Unit 12100202, on right bank at downstream side of bridge on U.S. Highway 90-A, 1.3 mi (2.1 km) downstream from Mitchell Creek, 3.1 mi (5.0 km) southwest of Dillworth, 6.4 mi (10.3 km) upstream from mouth, and 8.5 mi (13.7 km) southeast of Gonzales.

DRAINAGE AREA.--460 mi<sup>2</sup> (1,191 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1959 to current year.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Prior to Feb. 11, 1960, nonrecording gage at same site and datum. Datum of gage is 213.53 ft (65.084 m) above mean sea level.

REMARKS.--Water-discharge records good. Recording rain gage located at station.

AVERAGE DISCHARGE.--18 years, 167 ft<sup>3</sup>/s (4.729 m<sup>3</sup>/s), 4.93 in/yr (125 mm/yr), 121,000 acre-ft/yr (149 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 76,800 ft<sup>3</sup>/s (2,170 m<sup>3</sup>/s) Apr. 20, 1977, gage height, 33.11 ft (10.092 m); no flow at times in 1959-67, 1969-74.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1840, 35.3 ft (10.76 m) in June 1940. A stage of 32.8 ft (10.00 m) was reached June 30, 1936, but may have been affected by backwater from Guadalupe River, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,800 ft<sup>3</sup>/s (51.0 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 17	2200	1,820 51.5	22.61 6.892	Dec. 13	0800	3,750 106	26.80 8.169
Oct. 26	1700	2,280 6.46	24.20 7.376	Feb. 12	1400	5,890 167	27.81 8.476
Oct. 31	1500	4,360 123	27.16 8.278	Apr. 18	0900	5,410 153	27.65 8.428
Nov. 28	0800	2,910 82.4	25.71 7.836	Apr. 20	2300	*76,800 2,170	33.11 10.092
Dec. 7	0500	8,980 254	28.64 8.729				

Minimum discharge, 0.20 ft<sup>3</sup>/s (0.006 m<sup>3</sup>/s) Aug. 10, 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	2270	116	47	804	41	26	299	21	9.6	.72	.86
2	2.6	259	85	46	369	40	25	122	21	9.0	.58	.79
3	1.8	45	68	53	456	42	23	82	18	8.5	.48	.74
4	1.5	22	59	60	678	45	23	73	17	8.2	.41	.75
5	180	13	939	63	382	47	21	57	15	7.7	.40	.70
6	119	8.9	5350	59	126	46	19	50	16	7.3	.32	1.5
7	32	6.8	8000	54	73	40	18	46	18	7.0	.31	1.5
8	15	6.3	4620	51	55	37	17	42	16	6.8	.30	6.9
9	9.0	6.1	1320	50	48	35	16	40	14	6.0	.31	2.1
10	6.1	5.8	224	51	340	35	16	38	13	5.5	.27	1.3
11	4.4	5.5	1460	49	2560	36	15	37	12	5.3	.29	1.1
12	3.6	5.3	2300	46	5120	35	15	53	15	5.1	.51	1.3
13	2.9	5.1	3350	49	4050	34	15	46	15	4.8	.87	1.7
14	2.5	5.0	1620	110	1090	32	35	34	16	4.5	.75	2.6
15	38	5.0	1310	182	217	31	149	30	21	4.2	.53	1.9
16	1330	5.0	1240	104	135	30	1490	27	52	4.1	.44	1.2
17	1680	5.0	415	61	104	29	3130	26	101	4.0	.45	1.0
18	1140	5.0	196	48	89	28	5040	26	37	3.7	.86	1.0
19	217	287	162	41	82	27	21100	27	22	3.7	1.0	1.2
20	987	1170	375	38	75	26	28700	29	17	3.7	.78	1.3
21	981	904	400	36	68	24	21200	61	14	3.8	.72	2.2
22	289	178	191	37	64	23	6520	66	13	3.5	.81	2.1
23	55	71	114	66	63	22	2930	56	14	3.3	.85	1.5
24	560	51	90	176	58	23	623	59	19	3.1	.64	1.4
25	1950	91	82	116	53	25	198	57	30	2.9	.50	1.4
26	2130	1690	96	68	50	24	128	34	19	2.6	.69	1.3
27	1200	2150	105	51	46	30	101	33	14	2.2	1.1	1.2
28	115	2670	81	44	43	33	88	28	13	1.7	.84	1.2
29	1270	832	64	39	---	41	86	23	11	1.4	.87	1.1
30	2690	197	56	39	---	42	101	21	10	1.1	1.0	1.0
31	3890	---	52	709	---	33	---	20	---	.87	1.0	---
TOTAL	20907.0	12974.8	34540	2643	17298	1036	91868	1642	634	145.17	19.60	45.84
MEAN	674	432	1114	85.3	618	33.4	3062	53.0	21.1	4.68	.63	1.53
MAX	3890	2670	8000	709	5120	47	28700	299	101	9.6	1.1	6.9
MIN	1.5	5.0	52	36	43	22	15	20	10	.87	.27	.70
CFSM	1.47	.94	2.42	.19	1.34	.07	6.66	.12	.05	.01	.001	.003
IN.	1.69	1.05	2.79	.21	1.40	.08	7.43	.13	.05	.01	.00	.00
AC-FT	41470	25740	68510	5240	34310	2050	182200	3260	1260	288	39	91
CAL YR 1976	TOTAL	127627.69	MEAN	349	MAX	8000	MIN	.36	CFSM	.76	IN	10.32
WTR YR 1977	TOTAL	183753.41	MEAN	503	MAX	28700	MIN	.27	CFSM	1.09	IN	14.86
										AC-FT	253100	
										AC-FT	364500	



GUADALUPE RIVER BASIN  
08174600 PEACH CREEK BELOW DILWORTH, TX--Continued  
WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: April 1962 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)
OCT 12...	1545	3.6	317	7.2	25.0	82	16	25	4.8	28
NOV 23...	1407	66	377	7.6	12.0	110	65	33	7.6	27
JAN 04...	1420	63	1200	7.7	8.0	380	270	110	26	110
FEB 17...	1445	99	853	7.3	14.5	270	170	79	17	66
APR 06...	1745	19	1520	7.6	16.0	480	350	140	32	140
MAY 18...	1625	26	1050	7.5	22.5	330	220	95	22	98
JUN 29...	1310	11	675	6.8	27.0	170	83	48	13	71
AUG 08...	1314	.34	970	7.5	28.0	220	15	65	14	120
SEP 20...	1145	1.1	520	7.5	27.0	47	0	14	3.0	100

DATE	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 12...	1.3	6.0	81	0	46	27	.3	13	190
NOV 23...	1.1	6.2	59	0	68	41	.2	14	226
JAN 04...	2.5	6.0	138	0	270	150	.3	26	766
FEB 17...	1.8	5.4	116	0	190	99	.1	22	536
APR 06...	2.8	5.7	157	0	350	220	.2	28	993
MAY 18...	2.4	5.1	136	0	240	130	.3	27	684
JUN 29...	2.3	4.8	110	0	130	74	.2	18	413
AUG 08...	3.5	4.8	250	0	140	99	.3	18	584
SEP 20...	6.3	3.0	220	0	28	34	.2	18	309

## 08175000 SANDIES CREEK NEAR WESTHOFF, TX

LOCATION.--Lat 29°12'54", long 97°26'57", De Witt County, Hydrologic Unit 12100202, on left bank 100 ft (30 m) downstream from bridge on county highway, 1.9 mi (3.1 km) upstream from Birds Creek, 2.0 mi (3.2 km) northeast of Westhoff, and 20.4 mi (32.8 km) upstream from mouth.

DRAINAGE AREA.--549 mi<sup>2</sup> (1,422 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1930 to November 1934, August 1959 to current year.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 178.27 ft (54.337 m) above mean sea level. Prior to Nov. 9, 1934, water-stage recorder at site 150 ft (46 m) upstream at datum 0.86 ft (0.262 m) higher. Aug. 10, 1959, to Feb. 2, 1960, nonrecording gage at present site and datum.

REMARKS.--Water-discharge records good. No known diversion above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--22 years (water years 1931-34, 1960-77), 136 ft<sup>3</sup>/s (3.852 m<sup>3</sup>/s), 3.36 in/yr (85 mm/yr), 98,530 acre-ft/yr (121 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 79,700 ft<sup>3</sup>/s (2,260 m<sup>3</sup>/s) Sept. 22, 1967, gage height, 32.34 ft (9.857 m), from rating curve extended above 21,000 ft<sup>3</sup>/s (595 m<sup>3</sup>/s) on basis of slope-area measurement of 92,700 ft<sup>3</sup>/s (2,630 m<sup>3</sup>/s); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1864, 92,700 ft<sup>3</sup>/s (2,630 m<sup>3</sup>/s) July 2, 1936, gage height, 33.1 ft (10.09 m), from floodmarks, on basis of computation of peak flow, at present site and datum. Flood in October 1913 reached a stage of 26.0 ft (7.92 m), present site and datum, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 26	2100	2,050	58.1	Dec. 20	2200	1,100	31.2
Oct. 31	1200	4,980	141	Feb. 13	1000	2,490	70.5
Nov. 28	0500	4,040	114	Apr. 17	1600	*17,500	496
Dec. 7	0300	10,000	283	Apr. 22	1700	4,140	117
Dec. 16	0200	1,180	33.4	May 1	1900	1,630	46.2
							16.58
							5.054

Minimum discharge, 1.0 ft<sup>3</sup>/s (0.028 m<sup>3</sup>/s) Aug. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	421	2780	168	50	359	29	20	1390	23	12	3.4	1.3		
2	120	865	108	47	321	29	20	1380	23	11	3.7	1.2		
3	41	150	80	45	251	29	19	738	27	10	3.4	1.3		
4	23	76	65	45	209	30	18	224	28	9.7	2.9	2.0		
5	190	52	471	45	178	29	17	98	24	9.2	2.5	2.2		
6	244	40	5360	46	114	29	16	67	21	8.6	2.3	2.2		
7	140	33	8370	45	76	28	15	54	19	8.0	2.2	3.3		
8	65	29	4280	44	60	26	14	47	17	7.8	2.0	35		
9	30	25	1590	44	52	25	14	42	16	7.4	1.9	32		
10	20	23	341	42	163	25	13	87	16	7.1	1.9	8.3		
11	15	22	466	39	956	26	12	85	18	7.3	1.7	7.8		
12	12	21	768	42	2020	25	12	49	40	6.6	1.5	5.7		
13	10	20	587	71	2380	24	14	37	109	5.7	1.5	10		
14	8.7	20	611	177	1300	24	18	33	126	5.3	1.4	299		
15	19	20	1040	243	272	23	186	31	57	5.2	1.9	374		
16	266	20	1080	199	121	23	3280	29	26	5.3	2.1	223		
17	308	21	581	115	83	23	13500	28	20	5.9	1.8	87		
18	316	21	206	72	66	22	8410	26	18	5.8	1.4	37		
19	196	89	354	54	57	21	3550	26	16	5.9	1.2	23		
20	259	162	1020	46	51	20	1770	26	15	5.7	1.2	16		
21	257	200	817	41	46	20	1940	32	14	6.6	1.2	12		
22	149	157	483	73	43	18	3630	72	13	7.1	1.2	10		
23	67	85	206	374	41	18	2650	177	27	6.0	1.3	9.5		
24	290	54	111	772	40	17	752	194	30	6.0	1.4	8.4		
25	1020	71	119	902	37	18	161	162	38	5.4	1.1	7.8		
26	1830	682	228	425	35	19	99	76	34	4.8	1.2	7.0		
27	1680	2290	183	152	32	21	73	46	23	4.4	1.1	6.3		
28	654	3620	134	96	31	21	59	36	17	4.2	1.2	6.2		
29	736	1680	89	71	---	22	52	30	14	4.0	1.1	6.0		
30	2480	415	67	60	---	22	507	27	13	2.8	1.4	5.5		
31	4670	---	56	95	---	21	---	25	---	3.4	1.4	---		
TOTAL	16536.7	13743	30039	4572	9394	727	40841	5374	882	204.2	55.5	1250.0		
MEAN	533	458	969	147	336	23.5	1361	173	29.4	6.59	1.79	41.7		
MAX	4670	3620	8370	902	2380	30	13500	1390	126	12	3.7	374		
MIN	8.7	20	56	39	31	17	12	25	13	2.8	1.1	1.2		
CFSM	.97	.83	1.77	.27	.61	.04	2.48	.32	.05	.01	.003	.08		
IN.	1.12	.93	2.04	.31	.64	.05	2.77	.36	.06	.01	.00	.08		
AC-FT	32800	27260	59580	9070	18630	1440	81010	10660	1750	405	110	2480		
CAL YR 1976	TOTAL	84096.5	MEAN	230	MAX	8370	MIN	2.5	CFSM	.42	IN	5.70	AC-FT	166800
WTR YR 1977	TOTAL	123618.4	MEAN	339	MAX	13500	MIN	1.1	CFSM	.62	IN	8.38	AC-FT	245200

## GUADALUPE RIVER BASIN

08175000 SANDIES CREEK NEAR WESTHOFF, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: April 1962 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)
OCT 14...	1420	8.8	550	7.4	24.0	98	0	30	5.7	71
NOV 24...	1420	56	660	7.4	13.5	140	47	41	10	81
JAN 06...	1415	45	1370	7.7	9.0	320	130	93	22	170
FEB 15...	1205	228	389	7.2	14.0	90	22	26	6.0	38
APR 04...	1600	19	1780	7.7	20.5	380	140	110	26	240
MAY 16...	1127	30	1340	7.5	23.5	300	110	88	19	170
JUN 30...	1734	12	1280	7.5	29.0	220	23	65	14	190
AUG 10...	0829	1.9	1760	8.1	27.0	270	0	84	15	290
SEP 20...	1530	16	486	7.5	27.0	83	0	25	5.0	66

DATE	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SIO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 14...	3.1	10	122	0	48	80	.1	18	323
NOV 24...	2.9	8.8	118	0	83	93	.2	16	391
JAN 06...	4.1	8.4	232	0	190	240	.5	23	861
FEB 15...	1.7	7.5	82	0	46	51	.1	17	232
APR 04...	5.3	8.9	290	0	240	300	.4	22	1090
MAY 16...	4.3	8.0	226	0	170	200	.3	24	791
JUN 30...	5.6	8.4	240	0	120	230	.4	19	765
AUG 10...	7.7	12	410	0	120	300	.6	23	1050
SEP 20...	3.2	7.6	120	0	43	69	.2	18	293

08175800 GUADALUPE RIVER AT CUERO, TX

LOCATION.--Lat 29°03'57", long 97°19'16", De Witt County, Hydrologic Unit 12100204, on left bank at downstream side of bridge on U.S. Highways 77-A, 87, and 183, 2.1 mi (3.4 km) upstream from Gohike Creek, 2.4 mi (3.9 km) southwest of Cuero, 4.2 mi (6.8 km) downstream from Sandies Creek, and at mile 100.6 (161.9 km).

DRAINAGE AREA.--4,934 mi<sup>2</sup> (12,779 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1902 to December 1906, August 1916 to December 1935, January 1964 to current year. Published as "near Cuero" 1902-6, and as "below Cuero" 1916-35. Gage-height records collected at site 7.1 mi (11.4 km) upstream from Sandies Creek from 1941 to 1966 (published in reports of the National Weather Service) and at present site since June 12, 1968.

REVISED RECORDS.--WDR TX-1968-1969-1: Drainage areas at all sites.

GAGE.--Water-stage recorder. Datum of gage is 128.64 ft (39.209 m) above mean sea level. Dec. 26, 1902, to June 1903, nonrecording gage at site 7.1 mi (11.4 km) upstream at different datum, gage heights moved to site 3.3 mi (5.3 km) upstream from present site before computation; July 1903 to December 1906 nonrecording gage 3.3 mi (5.3 km) upstream at different datum; Aug. 19, 1916, to Dec. 16, 1935, water-stage recorder at site 5.0 mi (8.0 km) downstream at datum 3.19 ft (0.972 m) lower.

REMARKS.--Water-discharge records good. Flow below New Braunfels is partly regulated by a series of small power dams, combined capacity of six largest dams 33,550 acre-ft (41.4 hm<sup>3</sup>). Flow is affected at times by discharge from flood-detention pools of 50 floodwater-retarding structures with combined detention capacity of 68,060 acre-ft (83.9 hm<sup>3</sup>). These structures control runoff from 220 mi<sup>2</sup> (570 km<sup>2</sup>) in the Comal, San Marcos, and Plum Creek drainage basins. Many small diversions above station. National Weather Service gage-height telemark at station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--33 years (water years 1904-6, 1917-18, 1921-35, 1965-77), 1,639 ft<sup>3</sup>/s (46.42 m<sup>3</sup>/s), 1,187,000 acre-ft/yr (1.46 km<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 101,000 ft<sup>3</sup>/s (2,860 m<sup>3</sup>/s) May 30, 1929, gage height, 35.2 ft (10.73 m), site and datum then in use, from rating curve extended above 45,000 ft<sup>3</sup>/s (1,270 m<sup>3</sup>/s); maximum gage height, 36.90 ft (11.247 m) May 14, 1972; minimum daily discharge, 79 ft<sup>3</sup>/s (2.24 m<sup>3</sup>/s) Aug. 13, 14, 1967.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1900, probably occurred July 2, 1936, 44.33 ft (13.512 m), present site and datum, from information by Texas Highway Department. Other floods at this station occurred Mar. 1, 1903, 43.0 ft (13.11 m), at different site and datum; Oct. 4, 1913, 37.57 ft (11.451 m), at different site and datum; Dec. 6, 1913, 34.57 ft (10.537 m), at different site and datum; Oct. 20, 1919, 32.2 ft (9.81 m), site and datum then in use; May 30, 1929, 35.2 ft (10.73 m), site and datum then in use; June 21, 1961, 37.0 ft (11.28 m), present site and datum; all from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 7,500 ft<sup>3</sup>/s (212 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 18	2200	9,580	271	Dec. 14	1800	9,300	263
Oct. 27	2300	12,700	360	Dec. 20	0900	8,120	230
Nov. 2	1500	17,000	481	Feb. 14	2000	14,400	408
Nov. 29	1500	14,500	411	Apr. 22	1800	*52,400	1,480
Dec. 8	1600	22,700	643	May 1	1600	10,100	286

Minimum discharge, 772 ft<sup>3</sup>/s (21.9 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2350	15000	3320	2370	4040	2280	2260	9960	2470	1870	1370	851
2	1350	16700	2770	2380	4610	2240	1790	9880	2480	1820	1420	854
3	983	11700	2530	2370	4080	2230	1840	9150	2460	1760	1420	845
4	911	3630	2430	2380	3740	2240	1910	7910	2410	1770	1190	806
5	1890	3020	2820	2420	3700	2260	1900	7290	2360	1780	1080	841
6	2190	2800	11100	2410	3200	2300	1890	7070	2340	1770	1110	836
7	2400	2640	15300	2390	2710	2280	1870	6670	2350	1750	1120	860
8	1810	2530	21600	2380	2520	2230	1850	4390	2260	1760	1050	1060
9	1400	2570	21000	2350	2420	2180	1830	3370	2210	1750	1010	1730
10	865	2300	12900	2320	2680	2140	1800	3190	2180	1730	1140	1130
11	988	2240	4110	2310	6490	2120	1760	3460	2230	1670	1030	942
12	997	2210	6180	2310	9730	2100	1760	5190	2260	1770	1020	884
13	1170	2190	6840	2610	12000	2070	1760	3630	2410	1660	1030	897
14	1060	2230	8490	2260	13900	2070	1790	3020	3160	1660	1040	1280
15	1040	2320	8570	3070	11900	2070	1850	2910	3350	1730	1040	1860
16	2200	2250	8010	3640	4720	2040	7610	2810	2660	1660	992	1470
17	5740	2170	6380	3130	3580	2050	14900	2760	2090	1640	1030	1140
18	8990	2160	4080	2700	3200	2040	22500	2760	2360	1650	1020	919
19	6930	2350	3960	2470	3000	2020	25300	4090	2250	1610	992	892
20	3060	2600	7570	2350	2910	2000	24200	4630	2170	1670	994	895
21	4790	4690	5120	2310	2620	1980	23200	3540	2070	1700	961	947
22	4520	4930	4000	2340	2610	1950	45400	3310	2020	1660	964	928
23	2460	3330	3370	2730	2560	1930	43700	3260	2010	1620	977	904
24	2150	2600	2920	3310	2520	1920	29300	3180	2260	1600	979	879
25	6100	2310	2850	4730	2470	1940	19800	3000	2210	1480	937	859
26	10100	3460	3010	4240	2420	1940	14000	2810	2240	1460	885	844
27	12200	8940	2920	3140	2360	1970	9960	2580	2100	1520	854	824
28	10300	12100	2780	2720	2310	2020	8640	2570	1990	1400	867	866
29	4960	14100	2620	2520	---	2060	8110	2560	1940	1440	835	896
30	8960	8620	2500	2410	---	2040	8420	2520	1900	1470	890	793
31	12400	---	2390	2580	---	2020	---	2500	---	1440	939	---
TOTAL	127264	150690	194440	83650	125000	64730	332900	135970	69300	51270	32186	29732
MEAN	4105	5023	6272	2698	4464	2088	11100	4386	2310	1654	1038	991
MAX	12400	16700	21600	4730	13900	2300	45400	9960	3350	1870	1420	1860
MIN	865	2160	2390	2260	2310	1920	1760	2500	1900	1400	835	793
AC-FT	252400	298900	385700	165900	247900	128400	660300	269700	137500	101700	63840	58970
CAL YR 1976	TOTAL	1140420	MEAN	3116	MAX	21600	MIN	692	AC-FT	2262000		
WTR YR 1977	TOTAL	1397132	MEAN	3828	MAX	45400	MIN	793	AC-FT	2771000		

## GUADALUPE RIVER BASIN

08175800 GUADALUPE RIVER AT CUERO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: March 1968 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)
OCT 14...	0840	949	508	8.1	24.0	230	30	66	15	22
NOV 24...	1110	2670	528	7.9	14.0	220	45	68	13	26
JAN 11...	1452	2310	712	8.1	9.5	300	59	88	19	37
FEB 16...	1215	4500	476	7.7	16.0	190	35	58	9.9	26
APR 05...	1238	1900	653	8.0	21.0	300	62	87	20	31
MAY 19...	1510	4480	596	8.0	24.0	270	35	79	17	25
JUN 30...	1439	1900	577	7.4	29.0	250	32	72	16	26
AUG 09...	1416	958	563	7.7	31.0	250	24	72	16	26
SEP 20...	1320	928	587	8.2	29.0	250	26	71	17	29
DATE	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SIO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	
OCT 14...	.6	2.5	240	0	26	32	.3	11	293	
NOV 24...	.8	3.9	218	0	37	37	.2	13	306	
JAN 11...	.9	2.5	291	0	50	60	.3	12	412	
FEB 16...	.8	4.2	184	0	40	37	.2	13	279	
APR 05...	.8	2.0	290	0	41	46	.2	13	383	
MAY 19...	.7	2.3	283	0	35	39	.2	12	349	
JUN 30...	.7	2.2	260	0	33	42	.2	12	332	
AUG 09...	.7	2.0	270	0	31	35	.2	13	328	
SEP 20...	.8	2.3	270	0	32	42	.2	14	341	

08176500 GUADALUPE RIVER AT VICTORIA, TX  
(National stream-quality accounting network)

LOCATION.--Lat 28°47'34", long 97°00'46", Victoria County, Hydrologic Unit 12100204, on left bank just upstream from pier of upstream bridge of two bridges on U.S. Highway 59 in Victoria, 1,300 ft (396 m) upstream from Southern Pacific Railroad Co. bridge, 15 mi (24 km) upstream from Coleta Creek, and at mile 50.7 (81.6 km).

DRAINAGE AREA.--5,198 mi<sup>2</sup> (13,463 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1934 to current year. Gage-height records collected in this vicinity since 1904 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 29.15 ft (8.885 m) above mean sea level.

REMARKS.--Water-discharge records good. Many diversions above station. Records furnished by city of Victoria show that they discharged about 6,900 acre-ft (8.51 hm<sup>3</sup>) of sewage effluent below station.

AVERAGE DISCHARGE.--42 years (water years 1936-77), 1,776 ft<sup>3</sup>/s (50.30 m<sup>3</sup>/s), 1,287,000 acre-ft/yr (1.59 km<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 179,000 ft<sup>3</sup>/s (5,070 m<sup>3</sup>/s) July 3, 1936, gage height, 31.22 ft (9.516 m); minimum daily, 14 ft<sup>3</sup>/s (0.40 m<sup>3</sup>/s) Aug. 20, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1833, that of July 3, 1936. Flood of June 1, 1929, reached a stage of 30.2 ft (9.21 m), present site and datum.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 7,800 ft<sup>3</sup>/s (221 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 19	1600	8,620	244	20.81	6.343	Dec. 15	0900	9,530	270	22.18	6.760
Oct. 28	2000	10,900	309	23.89	7.282	Dec. 20	2400	8,250	234	20.25	6.172
Nov. 3	1600	14,800	419	26.96	8.217	Feb. 15	2000	12,600	357	25.53	7.782
Nov. 30	1400	12,400	351	25.43	7.751	Apr. 24	0400	*54,500	1,540	30.09	9.171
Dec. 10	0600	20,100	569	28.50	8.687	June 15	1600	7,810	221	19.97	6.087

Minimum discharge, 845 ft<sup>3</sup>/s (23.9 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2750	11100	7170	2680	3190	2550	2250	8860	2540	2010	1500	991
2	1990	12900	3820	2700	4680	2520	2340	9330	2550	1970	1480	957
3	1330	14500	3170	2720	4920	2480	1910	9140	2520	1910	1500	957
4	1100	9690	2830	2660	4410	2480	2030	8470	2480	1870	1450	930
5	1640	4190	2810	2670	4120	2480	2040	7620	2430	1890	1250	903
6	2320	3520	6190	2700	3910	2490	2020	7240	2390	1860	1250	923
7	2330	3180	10900	2650	3260	2490	2020	7050	2360	1850	1240	933
8	2210	2950	13600	2600	2850	2460	1990	6110	2340	1840	1220	964
9	1750	2800	18200	2610	2680	2410	1970	4270	2300	1840	1170	1370
10	1290	2780	19800	2560	2890	2360	1950	3720	2260	1820	1190	1510
11	1070	2510	12500	2510	5660	2340	1910	3530	2410	1770	1220	1110
12	1160	2470	6280	2510	8470	2320	1880	4550	2670	1830	1160	998
13	1140	2480	7660	2670	9550	2290	1890	4890	2480	1780	1150	1070
14	1290	2420	8190	2970	10900	2260	1920	3570	2660	1730	1160	1140
15	1180	2440	9400	2680	12200	2260	1920	3200	5970	1770	1170	1490
16	2650	2490	8610	3680	10000	2240	3270	3070	4490	1780	1150	1710
17	3940	2420	7880	3830	4930	2240	9160	2950	3010	1730	1130	1360
18	6870	2330	6010	3220	3980	2230	12100	2870	2370	1720	1160	1110
19	8400	2760	4470	2830	3580	2220	16400	3380	2450	1710	1120	991
20	5470	3180	6990	2610	3450	2190	19900	4760	2320	1690	1110	957
21	3930	3560	7360	2510	3120	2170	20600	4660	2240	1730	1100	974
22	5380	5550	5260	2540	2990	2140	20200	3840	2170	1720	1070	1000
23	4030	4820	4380	3010	2940	2110	36000	3700	2140	1690	1080	984
24	2510	3490	3760	3400	2850	2110	50100	3540	2290	1660	1090	947
25	3650	2690	3530	4120	2790	2110	32000	3270	2300	1630	1090	943
26	7180	2650	3810	5110	2740	2120	19900	3060	2280	1530	1040	903
27	9350	5280	3570	4130	2660	2120	13800	2840	2270	1580	1000	893
28	10600	8890	3360	3240	2600	2170	9590	2700	2150	1560	984	888
29	9470	10900	3140	2860	---	2200	8410	2650	2090	1490	1030	931
30	8110	12100	2940	2680	---	2210	8020	2610	2050	1540	957	916
31	9470	---	2780	2580	---	2200	---	2560	---	1520	1020	---
TOTAL	125560	153040	210370	92240	132320	70970	309490	144010	76980	54020	36241	31753
MEAN	4050	5101	6786	2975	4726	2289	10320	4645	2566	1743	1169	1058
MAX	10600	14500	19800	5110	12200	2550	50100	9330	5970	2010	1500	1710
MIN	1070	2330	2780	2510	2600	2110	1880	2560	2050	1490	957	888
AC-FT	249000	303600	417300	183000	262500	140800	613900	285600	152700	107100	71880	62980
CAL YR 1976	TOTAL	1192002	MEAN	3257	MAX	19800	MIN	725	AC-FT	2364000		
WTR YR 1977	TOTAL	1436994	MEAN	3937	MAX	50100	MIN	888	AC-FT	2850000		



## GUADALUPE RIVER BASIN

08176500 GUADALUPE RIVER AT VICTORIA, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1945 to September 1946, October 1948 to current year. Sediment records: October 1972 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1945 to current year.

WATER TEMPERATURES: November 1950 to current year.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,950 micromhos on several days during January 1946; minimum daily, 155 micromhos Sept. 22, 1967.

WATER TEMPERATURES: Maximum daily, 32.0°C Aug. 4, 27, 1952; minimum daily, 2.0°C Jan. 11, 12, 1962, Jan. 24, 1963.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 822 micromhos Jan. 18; minimum daily, 237 micromhos Apr. 23.

WATER TEMPERATURES: Maximum daily, 30.0°C on many days during summer months; minimum daily, 8.0°C Jan. 19.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)
DATE	TIME	(CFS)		(UNITS)						
OCT 21...	1215	3700	295	7.3	17.0	110	160	8.4	89	2.4
NOV 19...	0905	2600	654	8.0	12.5	15	25	7.6	74	1.1
DEC 16...	1220	8300	372	7.6	13.0	90	80	9.8	96	1.5
JAN 13...	1815	2800	675	7.9	11.5	0	15	10.4	98	.9
FEB 17...	1300	4400	472	7.5	15.5	55	90	8.6	89	2.1
MAR 17...	1645	2200	660	7.9	21.0	0	15	9.5	109	.9
APR 14...	1155	1900	590	7.8	22.0	0	20	8.1	95	2.4
MAY 12...	1830	5200	612	7.7	24.0	0	60	7.8	95	1.9
JUN 09...	1345	2800	596	7.8	29.0	0	15	7.5	99	.5
JUL 14...	1700	1800	567	7.7	30.0	0	20	7.6	101	1.5
AUG 18...	1430	1170	569	7.4	30.0	0	15	7.6	101	.9
SEP 15...	1510	1700	577	7.8	28.5	10	40	7.4	96	1.7
	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL./ 100 ML)	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)
DATE	100 ML)	100 ML)	100 ML)							
OCT 21...	1300	1000	900	120	20	38	5.3	15	.6	5.5
NOV 19...	6600	1600	5700	280	57	84	18	33	.9	2.9
DEC 16...	8600	2500	9800	140	28	45	7.3	20	.7	4.5
JAN 13...	2100	140	21000	--	--	--	--	--	--	--
FEB 17...	1300	660	1100	190	35	59	9.4	26	.8	4.1
MAR 17...	1100	56	210	--	--	--	--	--	--	--
APR 14...	1400	870	1400	280	39	81	18	30	.8	2.3
MAY 12...	5000	160	450	270	38	79	17	29	.8	2.4
JUN 09...	780	45	140	270	43	81	17	27	.7	2.1
JUL 14...	640	90	170	--	--	--	--	--	--	--
AUG 18...	1800	620	730	240	24	67	17	28	.8	2.1
SEP 15...	62000	840	960	240	27	70	16	29	.8	2.4

## GUADALUPE RIVER BASIN

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08176500 GUADALUPE RIVER AT VICTORIA, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SIO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)
OCT 21...	118	0	21	20	.2	11	162	174	350	58
NOV 19...	276	0	43	52	.4	12	411	381	78	12
DEC 16...	140	0	29	31	.2	13	223	219	188	20
JAN 13...	--	--	--	--	--	--	--	--	68	12
FEB 17...	184	0	38	37	.2	13	300	278	212	44
MAR 17...	--	--	--	--	--	--	--	--	51	15
APR 14...	290	0	30	47	.2	14	375	366	42	8
MAY 12...	280	0	37	47	.2	13	364	363	163	25
JUN 09...	280	0	32	37	.3	13	347	348	50	8
JUL 14...	--	--	--	--	--	--	--	--	47	6
AUG 18...	260	0	29	40	.2	13	319	325	32	4
SEP 15...	260	0	30	47	.2	14	333	337	96	15

DATE	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUS- PENDE SEDI- MENT (MG/L)	SUS- PENDE SEDI- MENT DIS- CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT 21...	.61	.01	.04	.88	.21	--	319	3190	93
NOV 19...	1.1	.01	.01	.28	.08	--	79	555	81
DEC 16...	.48	.01	.04	.74	.14	--	205	4590	90
JAN 13...	1.3	.01	.02	.28	.06	--	55	416	71
FEB 17...	.69	.01	.04	.86	.11	7.2	90	1070	74
MAR 17...	1.2	.00	.01	.34	.04	--	66	392	82
APR 14...	1.1	.01	.01	.33	.07	7.2	81	416	78
MAY 12...	.95	.01	.01	.40	.10	--	221	3100	85
JUN 09...	1.1	.00	.01	.92	.05	3.6	77	582	85
JUL 14...	.99	.01	.01	.25	.05	--	57	277	94
AUG 18...	1.1	.01	.00	.79	.06	--	86	272	86
SEP 15...	1.5	.03	.01	.21	.08	--	110	505	91

## GUADALUPE RIVER BASIN

08176500 GUADALUPE RIVER AT VICTORIA, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)			
DATE	TIME											
FEB 17...	1300	3	1	--	100	0	0	30	9			
APR 14...	1155	2	2	--	200	0	0	<10	0			
JUN 09...	1345	1	1	--	100	<10	0	10	0			
AUG 18...	1430	1	0	600	100	<10	0	0	0			
DATE		TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)		
FEB 17...	3	0	8	3	5400	30	14	2	110			
APR 14...	0	0	0	0	750	0	5	0	30			
JUN 09...	<50	0	<10	1	590	20	<100	1	40			
AUG 18...	<50	1	10	1	410	20	<100	2	30			
DATE		DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)		
FEB 17...	10	.0	.0	0	0	--	0	30	10			
APR 14...	0	.0	.0	1	0	--	0	10	0			
JUN 09...	0	.0	.0	1	1	--	0	10	0			
AUG 18...	0	.1	.9	0	0	<10	0	20	10			
DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
FEB 17...	1300	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0
APR 14...	1155	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0
JUN 09...	1345	.0	--	.00	.00	--	.0	--	.00	--	.00	--
JUL 14...	1700	--	1	--	--	.0	--	0	--	.0	--	.0
AUG 18...	1430	.1	2	.00	.00	.0	.0	0	.00	.0	.00	.0

GUADALUPE RIVER BASIN

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08176500 GUADALUPE RIVER AT VICTORIA, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
FEB 17...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
APR 14...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
JUN 09...	.00	--	.00	.00	--	.00	--	.00	.00	--	.00	--
JUL 14...	--	.0	--	--	.0	--	.0	--	--	.0	--	.0
AUG 18...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
FEB 17...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
APR 14...	.00	.0	.00	.00	.00	.00	0	0	.00	.26	.00	.00
JUN 09...	.00	--	.00	.00	.00	.00	0	--	.00	.00	.00	.00
JUL 14...	--	.0	--	--	--	--	--	0	--	--	--	--
AUG 18...	.00	.0	.00	.00	.00	.00	0	0	.00	.02	.00	.00

08176500 GUADALUPE RIVER AT VICTORIA, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 21,76 1215	NOV 19,76 0905	DEC 16,76 1220	JAN 13,77 1815	FEB 17,77 1300					
TOTAL CELLS/ML	79	120	0	180	83					
DIVERSITY: DIVISION	0.0	1.0	0.0	1.2	0.9					
..CLASS	0.0	1.0	0.0	1.2	0.9					
..ORDER	0.0	1.0	0.0	2.0	0.9					
...FAMILY	0.0	1.3	0.0	2.9	2.3					
....GENUS	0.0	1.3	0.0	3.2	2.3					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....CHARACIACEAE										
....SCHROEDERIA	--	-	--	-	--	-	--	-	--	-
....OOCYSTACEAE										
....ANKISTRODESMUS	--	-	--	-	--	-	32#	17	--	-
....CHODATELLA	--	-	--	-	--	-	--	-	--	-
....OOCYSTIS	--	-	--	-	--	-	9	5	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	--	-
....SCENEDESMACEAE										
....CRUCIGENIA	--	-	--	-	--	-	--	-	--	-
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-
....TETRASTRUM	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CARTERIA	--	-	--	-	--	-	--	-	--	-
....CHLAMYDOMONAS	--	-	--	-	--	-	18	10	--	-
...POLYBLEPHARIDACEAE										
....SPERMATOOZOPSIS	--	-	--	-	--	-	--	-	--	-
..ZYGNEMATALES										
...DESMIDIACEAE										
....COSMARIUM	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	--	-	--	-	--	-	28	15	--	-
....MELOSIRA	--	-	--	-	--	-	--	-	--	-
....STEPHANODISCUS	--	-	--	-	--	-	--	-	--	-
..PENNIALES										
...ACHNANTHACEAE										
....COCCONEIS	--	-	5	4	*	0	--	-	--	-
...CYMBELLACEAE										
....CYMBELLA	--	-	--	-	--	-	--	-	14#	17
...FRAGILARIACEAE										
....FRAGILARIA	--	-	--	-	--	-	9	5	--	-
....SYNEDRA	--	-	9	7	--	-	9	5	14#	17
...GOMPHONEMACEAE										
....GOMPHONEMA	--	-	--	-	--	-	5	2	14#	17
...NAVICULACEAE										
....GYROSIGMA	--	-	--	-	--	-	--	-	--	-
....NAVICULA	--	-	--	-	--	-	9	5	--	-
...NITZSCHACEAE										
....NITZSCHIA	79#100		9	7	*	0	37#	20	--	-
...SURIARELLACEAE										
....SURIARELLA	--	-	--	-	--	-	18	10	14#	17
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCOCCALES										
....AGMENELLUM	--	-	--	-	--	-	--	-	--	-
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-
...HORMOGONALES										
...OSCILLATORIACEAE										
....OSCILLATORIA	--	-	92#	74	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
...CRYPTOCHRYSIDACEAE										
....CHROOMONAS	--	-	--	-	--	-	--	-	--	-
...CRYPTOMONODACEAE										
....CRYPTOMONAS	--	-	--	-	--	-	9	5	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
....EUGLENA	--	-	--	-	--	-	--	-	28#	33
....PHACUS	--	-	--	-	--	-	--	-	--	-
....TRACHELOMONAS	--	-	9	7	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

08176500 GUADALUPE RIVER AT VICTORIA, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	MAY 12,77 1830	JUN 9,77 1345	JUL 14,77 1700	AUG 18,77 1430	SEP 15,77 1510					
TOTAL CELLS/ML	6	870	690	480	360					
DIVERSITY: DIVISION	0.0	1.8	0.7	1.1	0.6					
..CLASS	0.0	1.9	0.7	1.1	0.7					
...ORDER	0.0	2.5	0.8	2.0	0.9					
....FAMILY	0.0	3.1	0.8	2.3	1.9					
.....GENUS	0.0	3.7	0.8	2.3	2.0					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....CHARACIACEAE										
....SCHROEDERIA	--	-	* 0		--	-	--	-	--	-
....OOCYSTACEAE										
....ANKISTRODESMUS	--	-	28 3		--	-	--	-	--	-
....CHODATELLA	--	-	7 1		--	-	--	-	--	-
....OOCYSTIS	--	-	41 5		--	-	--	-	--	-
....SELENASTRUM	--	-	17 2		--	-	--	-	--	-
....SCENEDESMACEAE										
....CRUCIGENIA	--	-	28 3		--	-	--	-	--	-
....SCENEDESMUS	--	-	21 2		--	-	--	-	--	-
....TETRASTRUM	--	-	14 2		--	-	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CARTERIA	--	-	14 2		--	-	--	-	--	-
....CHLAMYDOMONAS	--	-	52 6		--	-	6 1		--	-
...POLYBLEPHARIDACEAE										
....SPERMATOZOOPSIS	--	-	7 1		--	-	--	-	--	-
..ZYGNEMATALES										
...DESMIDIACEAE										
....COSMARUM	--	-	--	-	19 3		--	-	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	--	-	93 11		--	-	25 5		13 4	
....MELOSIRA	--	-	14 2		--	-	--	-	--	-
....STEPHANODISCUS	--	-	--	-	33 5		--	-	--	-
..PENNIALES										
...ACHNANTHACEAE										
....COCCONEIS	--	-	--	-	--	-	--	-	7 2	
....CYMBELLACEAE										
....CYMBELLA	--	-	--	-	--	-	--	-	--	-
....FRAGILARIACEAE										
....FRAGILARIA	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	* 0		7 1		--	-	19 4		--	-
...GOMPHONEMACEAE										
....GOMPHONEMA	--	-	--	-	--	-	--	-	7 2	
...NAVICULACEAE										
....GYROSIGMA	--	-	--	-	--	-	13 3		200# 55	
....NAVICULA	--	-	130# 16		38 6		25 5		7 2	
...NITZSCHACEAE										
....NITZSCHIA	6#100		110 13		--	-	13 3		72# 20	
...SURIPELLACEAE										
....SURIPELLA	--	-	--	-	--	-	--	-	7 2	
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCALES										
....CHROCOCCACEAE										
....AGMENELLIUM	--	-	55 6		600# 86		160# 34		--	-
....ANACYSTIS	--	-	150# 17		--	-	--	-	--	-
...HORMOGONALES										
....OSCILLATORIA										
....OSCILLATORIA	--	-	--	-	--	-	190# 39		--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
....CRYPTOCHRYSIDACEAE										
....CHROOMONAS	--	-	7 1		--	-	--	-	--	-
....CRYPTOMONODACEAE										
....CRYPTOMONAS	--	-	35 4		--	-	13 3		7 2	
..EUGLENOPHYCEAE										
...EUGLENALES										
....EUGLENAEAE										
....EUGLENA	--	-	24 3		--	-	--	-	46 13	
....PHACUS	--	-	* 0		--	-	--	-	--	-
....TRACHELOMONAS	--	-	--	-	5 1		13 3		--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%



## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	125560	348	200	68500	25	8570	19	6500	140
NOV. 1976.....	153040	406	230	96900	29	12100	22	9230	160
DEC. 1976.....	210370	388	220	127000	28	16000	21	12100	160
JAN. 1977.....	92240	681	390	98200	49	12300	37	9320	300
FEB. 1977.....	132320	525	300	108000	38	13600	29	10300	220
MAR. 1977.....	70970	665	380	73800	48	9250	37	7010	290
APR. 1977.....	309490	334	190	161000	24	20300	18	15300	130
MAY 1977.....	144010	535	310	120000	39	15100	30	11500	220
JUNE 1977.....	76980	575	330	69300	42	8670	32	6590	240
JULY 1977.....	54020	576	330	48600	42	6090	32	4620	240
AUG. 1977.....	36241	572	330	32500	41	4060	31	3080	240
SEPT 1977.....	31753	574	330	28500	42	3560	32	2710	240
TOTAL .....	1436994	**	**	1030000	**	130000	**	98300	**
WTD.AVG. ....	3936.97	460	260	**	33	**	25	**	180

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	325	255	318	710	659	675	677	466	631	593	548	593
2	448	243	422	700	635	690	645	453	621	607	550	596
3	444	248	483	690	612	700	649	451	631	590	558	593
4	465	280	547	691	622	699	681	447	600	579	550	521
5	498	395	575	689	586	620	645	455	621	595	567	588
6	461	455	400	605	557	608	670	479	603	600	561	579
7	479	510	265	640	582	689	672	485	592	607	569	593
8	446	530	278	668	636	683	668	487	611	600	577	579
9	441	540	272	719	654	560	656	535	596	595	588	575
10	537	558	259	696	630	707	622	585	616	592	568	566
11	560	581	274	675	462	689	660	596	617	594	565	533
12	587	591	350	663	450	685	643	630	600	592	554	493
13	549	620	355	699	386	682	579	585	587	590	582	548
14	538	635	357	674	382	675	590	622	575	585	583	468
15	571	630	346	680	380	665	650	575	439	579	580	598
16	491	622	374	710	344	661	550	523	458	585	588	609
17	450	571	456	739	473	672	383	548	447	561	582	585
18	370	610	408	822	536	678	319	610	504	579	569	567
19	342	653	440	702	587	672	284	642	578	545	580	555
20	294	582	418	688	625	678	255	630	603	537	579	567
21	306	599	381	680	650	674	272	556	631	545	561	592
22	318	550	446	676	676	643	301	544	610	554	577	619
23	330	541	571	637	699	674	237	596	599	571	576	596
24	350	503	595	658	692	595	245	590	598	550	579	586
25	330	520	610	690	699	666	250	610	616	547	583	585
26	345	555	640	656	705	652	315	590	599	568	580	588
27	339	475	659	664	708	650	409	600	587	554	583	589
28	270	373	673	634	690	662	474	610	600	571	578	566
29	268	310	665	650	---	657	480	608	603	574	581	582
30	256	263	681	645	---	673	490	605	640	554	581	599
31	265	---	704	655	---	675	---	631	---	540	594	---
MEAN	409	493	459	681	583	665	499	559	587	575	573	574

## GUADALUPE RIVER BASIN

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08176500 GUADALUPE RIVER AT VICTORIA, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23.0	13.0	10.0	11.0	11.0	16.0	18.0	20.0	27.0	28.0	30.0	28.0
2	23.0	13.0	10.0	---	11.0	16.0	20.0	21.0	26.0	29.0	30.0	28.0
3	24.0	14.0	11.0	9.0	10.0	18.0	21.0	21.0	27.0	28.0	30.0	29.0
4	24.0	14.0	10.0	10.0	10.0	16.0	21.0	21.0	27.0	29.0	30.0	29.0
5	25.0	15.0	---	11.0	10.0	16.0	21.0	---	26.0	29.0	30.0	29.0
6	22.0	16.0	14.0	10.0	10.0	15.0	19.0	21.0	27.0	29.0	30.0	29.0
7	21.0	16.0	13.0	10.0	12.0	15.0	20.0	22.0	26.0	29.0	29.0	28.0
8	21.0	16.0	13.0	10.0	12.0	15.0	20.0	22.0	27.0	29.0	30.0	28.0
9	19.0	16.0	12.0	10.0	12.0	15.0	20.0	22.0	28.0	29.0	30.0	28.0
10	20.0	17.0	12.0	9.0	13.0	16.0	20.0	22.0	28.0	29.0	30.0	28.0
11	20.0	18.0	11.0	9.0	14.0	17.0	21.0	22.0	28.0	28.0	30.0	28.0
12	20.0	16.0	12.0	9.0	15.0	16.0	21.0	23.0	---	29.0	29.0	28.0
13	21.0	15.0	---	10.0	15.0	17.0	21.0	23.0	28.0	29.0	30.0	28.0
14	21.0	14.0	11.0	10.0	---	18.0	21.0	24.0	28.0	29.0	30.0	27.0
15	21.0	---	11.0	10.0	15.0	18.0	22.0	24.0	28.0	29.0	30.0	28.0
16	20.0	13.0	11.0	10.0	14.0	18.0	21.0	24.0	27.0	29.0	30.0	28.0
17	19.0	13.0	12.0	9.0	14.0	20.0	19.0	24.0	27.0	29.0	30.0	28.0
18	19.0	13.0	13.0	9.0	15.0	20.0	19.0	24.0	27.0	29.0	30.0	28.0
19	19.0	13.0	---	8.0	16.0	21.0	19.0	24.0	28.0	29.0	29.0	28.0
20	17.0	13.0	14.0	9.0	15.0	20.0	20.0	24.0	28.0	29.0	29.0	28.0
21	16.0	13.0	13.0	9.0	15.0	20.0	20.0	23.0	28.0	29.0	29.0	28.0
22	16.0	12.0	12.0	10.0	15.0	18.0	20.0	23.0	28.0	29.0	30.0	28.0
23	---	12.0	12.0	11.0	17.0	19.0	21.0	23.0	28.0	29.0	30.0	28.0
24	---	14.0	---	11.0	16.0	19.0	21.0	24.0	28.0	29.0	30.0	29.0
25	17.0	---	---	10.0	17.0	20.0	21.0	24.0	28.0	30.0	30.0	---
26	18.0	---	---	12.0	17.0	20.0	21.0	24.0	27.0	30.0	30.0	---
27	17.0	15.0	12.0	13.0	16.0	20.0	21.0	24.0	28.0	30.0	30.0	28.0
28	16.0	14.0	13.0	14.0	---	18.0	21.0	25.0	28.0	30.0	29.0	29.0
29	16.0	12.0	13.0	12.0	---	20.0	20.0	25.0	28.0	30.0	28.0	29.0
30	14.0	11.0	13.0	12.0	---	20.0	21.0	25.0	28.0	30.0	28.0	28.0
31	13.0	---	11.0	11.0	---	19.0	---	26.0	---	30.0	28.0	---
MEAN	19.5	14.0	12.0	10.5	13.5	18.0	20.5	23.0	27.5	29.0	29.5	28.0

## 08177000 COLETO CREEK NEAR SCHROEDER, TX

LOCATION.--Lat 28°49'53", long 97°11'10", Goliad-Victoria County line, Hydrologic Unit 12100204, on left bank 373 ft (114 m) downstream from bridge on Farm Road 622, 2.5 mi (4.0 km) northeast of Schroeder, 4.2 mi (6.8 km) downstream from confluence of Twelvemile and Fifteenmile Creeks, 9.1 mi (14.6 km) upstream from Perdido Creek, 11.1 mi (17.9 km) west of Victoria, and 21.8 mi (35.1 km) upstream from mouth.

DRAINAGE AREA.--369 mi<sup>2</sup> (956 km<sup>2</sup>).

PERIOD OF RECORD.--January 1930 to December 1933, October 1952 to current year.

REVISED RECORDS.--WSP 1312: 1930(M). WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 87.59 ft (26.697 m) above mean sea level. Prior to Dec. 31, 1933, nonrecording gage at site 0.7 mi (1.1 km) downstream at same datum; Oct. 20, 1952, to Jan. 17, 1955, and Sept. 22 to Nov. 8, 1967, nonrecording gage at site 0.6 mi (1.0 km) downstream at same datum. Jan. 18, 1955, to Sept. 21, 1967, water-stage recorder at same site and datum.

REMARKS.--Records good. No known diversions above station. Several observations of water temperature were made during year.

AVERAGE DISCHARGE.--28 years, 96.5 ft<sup>3</sup>/s (2.733 m<sup>3</sup>/s), 3.55 in/yr (90 mm/yr), 69,910 acre-ft/yr (86.2 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 122,000 ft<sup>3</sup>/s (3,460 m<sup>3</sup>/s) Sept. 21, 1967, gage height, 33.47 ft (10.202 m), from floodmark, from rating curve extended above 28,000 ft<sup>3</sup>/s (793 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow for many days in 1956, 1963-65, and 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stages since at least 1872 at present site and datum, that of Sept. 21, 1967, Oct. 16, 1946, 26.0 ft (7.92 m), discharge 63,700 ft<sup>3</sup>/s (1,800 m<sup>3</sup>/s) and October 1925, 23.0 ft (7.01 m), discharge 46,700 ft<sup>3</sup>/s (1,320 m<sup>3</sup>/s), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,500 ft<sup>3</sup>/s (70.8 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 16	0500	*10,900	309	a12.10	3.688	Apr. 16	2300	9,090	257	11.60	3.536
Oct. 29	1500	8,660	245	a11.44	3.487	Apr. 21	0500	2,540	71.9	8.10	2.469
Dec. 20	0800	4,080	116	9.23	2.813						

a From floodmark.

Minimum discharge, 10 ft<sup>3</sup>/s (0.28 m<sup>3</sup>/s) for several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	71	177	119	94	73	67	57	977	69	31	15	12
2	49	125	92	98	90	69	59	247	69	30	16	13
3	39	101	75	104	363	73	59	144	61	28	16	14
4	34	86	67	103	336	71	52	114	56	27	14	13
5	146	75	84	97	155	69	45	98	51	27	14	11
6	170	69	1310	93	107	65	44	89	49	28	14	14
7	77	63	629	89	88	63	43	82	48	30	15	16
8	56	58	225	85	77	62	40	77	44	28	15	18
9	42	54	139	84	72	63	39	74	44	27	15	16
10	35	52	113	78	407	66	38	72	42	26	14	13
11	30	50	131	76	1520	68	38	68	43	25	16	11
12	27	43	329	81	1140	65	38	68	58	24	16	11
13	26	66	342	176	314	63	38	64	59	23	17	40
14	25	55	706	343	178	62	186	62	47	23	18	94
15	29	49	1210	222	133	63	83	61	76	24	17	67
16	4800	44	318	135	115	63	3790	60	79	23	18	41
17	705	44	185	104	104	63	2570	58	62	26	16	28
18	187	45	141	87	98	61	404	57	47	29	15	23
19	110	226	244	78	94	60	234	56	41	30	15	20
20	86	261	2730	73	88	56	258	54	38	40	14	18
21	65	143	568	71	85	56	1370	73	38	27	13	17
22	52	90	237	101	85	53	280	832	36	24	12	16
23	47	67	177	436	84	53	175	576	52	22	11	15
24	74	58	150	363	78	58	140	202	62	21	11	15
25	938	58	235	180	75	63	121	139	48	18	10	15
26	342	102	470	123	72	61	109	119	42	17	12	14
27	139	215	220	103	67	65	100	101	38	17	15	13
28	97	136	150	88	66	69	93	89	36	17	16	11
29	3300	266	123	75	---	63	87	83	34	17	17	11
30	1520	199	112	72	---	58	138	76	32	16	16	11
31	354	---	98	71	---	52	---	70	---	16	13	---
TOTAL	13672	3077	11729	3983	6164	1943	10728	4942	1501	761	456	631
MEAN	441	103	378	128	220	62.7	358	159	50.0	24.5	14.7	21.0
MAX	4800	266	2730	436	1520	73	3790	977	79	40	18	94
MIN	25	43	67	71	66	52	38	54	32	16	10	11
CFSM	1.20	.28	1.02	.35	.60	.17	.97	.43	.14	.07	.04	.06
IN.	1.38	.31	1.18	.40	.62	.20	1.08	.50	.15	.08	.05	.06
AC-FT	27120	6100	23260	7900	12230	3850	21280	9800	2980	1510	904	1250
CAL YR 1976	TOTAL	57711.8	MEAN 158	MAX 6380	MIN 7.3	CFSM .43	IN 5.82	AC-FT 114500				
WTR YR 1977	TOTAL	59587.0	MEAN 163	MAX 4800	MIN 10	CFSM .44	IN 6.01	AC-FT 118200				

## GUADALUPE RIVER BASIN

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08177600 OLMOS CREEK TRIBUTARY AT FARM ROAD 1535, SHAVANO PARK, TX  
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°34'35", long 98°32'45", Bexar County, Hydrologic Unit 12100301, at culvert on Farm Road 1535 at Shavano Park and 1.9 mi (3.1 km) southeast of intersection of Farm Roads 1535 and 1604.

DRAINAGE AREA.--0.33 mi<sup>2</sup> (0.85 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Digital recorders (water stage and rainfall). Datum of gage is 907.92 ft (276.734 m) above mean sea level, through the San Antonio supplementary adjustments of 1951 and 1953.

REMARKS.--Additional storm rainfall-runoff data for this site can be obtained from the report "Hydrologic Data for Urban Studies in the San Antonio, Texas Metropolitan Area, 1977."

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 303 ft<sup>3</sup>/s (8.58 m<sup>3</sup>/s) Sept. 26, 1973, gage height, 6.26 ft (1.908 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 50 ft<sup>3</sup>/s (1.42 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 15	1955	63	1.78	3.18	0.969	Oct. 29	0715	*64	1.81	3.19	0.972
Oct. 24	0345	a21	.59	2.74	.835	Apr. 20	1050	a23	.65	2.76	.841

a Water-quality samples obtained on this flood event.

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: May 1970 to current year. Water temperatures: May 1970 to current year. Bacteria analyses: April 1976 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM PER 100 ML	FECAL COLIFORM .7UM-MF (COL./100 ML)	
OCT 24...	1110	3.0	195	7.0	18.0	140	25	8.1	88	1.2	57000	33000	
APR 20...	1340	.50	184	7.4	22.5	140	15	6.8	80	3.7	100000	77000	
DATE	100 ML	FECAL STREP-TOCOCCKF AGAR (COL. PER (MG/L)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT 24...	83000	89	0	33	1.6	3.8	.2	4.8	111	0	5.1	5.7	
APR 20...	170000	86	0	32	1.5	3.2	.2	5.3	105	0	5.2	3.6	
DATE	DIS-SOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SI02) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	
OCT 24...	.2	16	125	24	6	.05	.01	.02	.59	.16	5.8	.10	
APR 20...	.0	16	119	20	8	.17	.01	.01	.79	.30	7.9	.00	

## GUADALUPE RIVER BASIN

08177600 OLMOS CREEK TRIBUTARY AT FARM ROAD 1535, SHAVANO PARK, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)					
DATE	TIME											
OCT 24...	1110	1	100	0	0	0	50					
APR 20...	1340	2	100	0	14	2	80					
		DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)					
DATE												
OCT 24...		2	0	.0	0	0	0					
APR 20...		2	0	.0	0	0	10					
DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLORINATED NAPHTHA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
OCT 24...	1110	.0	.00	.00	.0	.00	.00	.00	.01	.00	.00	.00
APR 20...	1340	.0	.00	.00	.0	.00	.00	.00	.01	.01	.00	.00
DATE		TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL HEPTA- CHLOR LENES (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 24...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.03	.00
APR 20...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.01	.00

## 08177700 OLMOS CREEK AT DRESDEN DRIVE, SAN ANTONIO, TX

LOCATION.--Lat 29°29'56", long 98°30'36", Bexar County, Hydrologic Unit 12100301, on right bank 30 ft (9 m) downstream from low-water bridge on Dresden Drive at San Antonio, 0.15 mi (0.24 km) west of intersection of Blanco Road and Dresden Drive, and 4.0 mi (6.4 km) upstream from Olmos Dam.

DRAINAGE AREA.--21.2 mi<sup>2</sup> (54.9 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 726.10 ft (221.315 m) above mean sea level.

REMARKS.--Water-discharge records good. Recording rain gage located at station, with three additional recording rain gages located in watershed. City of San Antonio rain gage and gage-height telemeters at station.

AVERAGE DISCHARGE.--9 years, 4.33 ft<sup>3</sup>/s (0.123 m<sup>3</sup>/s), 2.77 in/yr (70 mm/yr), 3,140 acre-ft/yr (3.87 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,420 ft<sup>3</sup>/s (153 m<sup>3</sup>/s) May 7, 1972, gage height, 13.20 ft (4.023 m), from floodmark; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1935, that of May 7, 1972; floods in September and November 1947 reached a stage of 8.5 ft (2.59 m), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 400 ft<sup>3</sup>/s (11.3 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 4	2245	*1,040	29.5	7.38	2.249	Apr. 19	2100	998	28.3	7.30	2.225
Oct. 15	2400	800	22.7	6.90	2.103	May 21	0830	420	11.9	6.25	1.905
Oct. 29	0730	535	15.2	6.47	1.972	Sept. 6	0500	415	11.8	66.92	2.109
aApr. 15	1345	73	2.07	4.87	1.484						

a Water-quality sample obtained on this flood event.

b From floodmark.

Minimum discharge, no flow Aug. 13-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.21	1.6	.57	.89	2.7	.80	.74	.68	4.5	.06	.01	.15
2	.06	.93	1.2	3.0	3.4	.80	.59	.18	5.3	.06	.01	.14
3	.04	.80	.51	1.0	4.6	5.4	1.1	.22	2.0	.06	.01	.10
4	110	.57	.47	.58	1.3	3.7	6.6	.26	.93	.06	.01	.06
5	41	.57	20	.56	.85	1.4	.28	.29	.80	.06	.01	.06
6	17	.57	7.5	1.6	.80	1.2	.14	.29	.57	.06	.01	2.9
7	.80	.48	2.1	.99	.80	1.1	.13	.24	.47	.06	.02	1.0
8	.68	.38	.89	.74	6.4	.87	.21	.26	.47	.06	.02	1.9
9	.38	.38	.68	2.2	1.1	.38	.18	29	.38	.06	.02	1.0
10	.38	.46	.68	.57	6.1	.38	.21	1.6	.30	.04	.02	.50
11	.31	.53	2.6	.47	12	.63	.21	21	.25	.04	.01	.40
12	.31	6.6	10	10	2.2	.74	.16	1.3	2.9	.04	.01	1.1
13	.31	7.9	5.5	19	1.5	.61	.21	.45	1.0	.04	.00	.90
14	.38	.51	6.6	3.2	1.4	.93	.33	.17	.80	.06	.00	.40
15	102	.43	1.6	1.5	1.4	1.1	18	.14	.90	.06	.00	.20
16	102	1.8	1.2	.78	1.5	.96	49	.14	.70	.06	.01	.15
17	2.2	11	.97	.51	1.4	.98	1.5	.14	.30	.06	.01	.13
18	.93	6.0	.93	.47	1.4	1.1	.04	.13	.20	.06	.01	.12
19	61	35	2.2	.47	1.1	1.0	66	.09	.15	.04	.02	.11
20	5.7	3.6	1.6	.51	.79	.93	234	.05	.11	.06	.01	.10
21	1.2	1.8	1.6	.57	.80	.89	22	65	.10	.02	.01	.09
22	.80	1.4	1.3	24	.80	.87	3.3	2.7	.59	.02	.01	.20
23	4.7	.64	.68	23	.83	.93	1.3	.31	27	.02	.01	.15
24	35	.47	.68	3.1	.93	1.3	.84	.18	3.1	.02	.01	.12
25	6.3	16	.77	1.2	.93	1.2	.58	.10	1.8	.01	.01	.10
26	.80	7.6	.96	.87	.81	5.3	.38	.06	.39	.01	.01	.10
27	1.2	1.4	.80	.57	.80	11	.36	.04	.10	.01	.02	.10
28	25	1.5	.70	.47	.80	3.0	.31	.04	.06	.01	.12	.09
29	202	.76	.68	.48	---	.50	.31	.06	.06	.01	.06	.09
30	16	.57	.68	23	---	.35	6.4	.02	.06	.01	.07	.09
31	3.9	---	.70	7.3	---	.33	---	.04	---	.01	.06	---
TOTAL	742.59	112.25	77.35	133.60	59.44	50.68	415.41	125.18	56.29	1.25	.61	12.55
MEAN	24.0	3.74	2.50	4.31	2.12	1.63	13.8	4.04	1.88	.040	.020	.42
MAX	202	35	20	24	12	11	234	65	27	.06	.12	2.9
MIN	.04	.38	.47	.47	.79	.33	.04	.02	.06	.01	.00	.06
CFSM	1.13	.18	.12	.20	.10	.08	.65	.19	.09	.002	.001	.02
IN.	1.30	.20	.14	.23	.10	.09	.73	.22	.10	.00	.00	.02
AC-FT	1470	223	153	265	118	101	824	248	112	2.5	1.2	25
(++)	9.05	2.66	1.86	3.78	.84	1.31	5.40	3.20	2.47	.05	.65	2.82

CAL YR 1976 TOTAL 2446.26 MEAN 6.68 MAX 710 MIN .00 CFSM .32 IN 4.29 AC-FT 4850 ++ 43.80  
WTR YR 1977 TOTAL 1787.20 MEAN 4.90 MAX 234 MIN .00 CFSM .23 IN 3.14 AC-FT 3540 ++ 34.09

++ Weighted-mean rainfall, in inches, based on four rain gages.



## GUADALUPE RIVER BASIN

08177700 OLMOS CREEK AT DRESDEN DRIVE, SAN ANTONIO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1968 to current year. Sediment records: October 1970 to September 1973.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM .7UM-MF (COL./ 100 ML)
OCT 19...	1805	80	152	7.2	14.0	110	130	--	--	2.9	51000	18000
APR 15...	1515	55	345	7.2	16.5	20	130	5.1	54	14	140000	20000
JUN 22...	1240	1.0	952	7.5	29.5	0	25	11.2	147	1.7	2500	360
	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
OCT 19...	52000	59	0	22	.9	5.0	.3	2.6	84	0	6.8	3.9
APR 15...	160000	130	5	48	3.5	19	.7	3.9	158	0	21	19
JUN 22...	1100	370	130	130	11	66	1.5	2.1	290	0	130	90
	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHY- LENE BLUE ACTIVE SUB- STANCE (MG/L)
OCT 19...	.2	6.0	89	182	50	.26	.02	.03	.65	.27	9.0	.00
APR 15...	.2	8.1	201	408	156	.47	.21	.22	2.9	.38	2.3	.20
JUN 22...	.5	12	585	52	16	4.0	.09	.06	1.1	.02	4.0	.10

GUADALUPE RIVER BASIN

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08177700 OLMOS CREEK AT DRESDEN DRIVE, SAN ANTONIO, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
OCT 19...	1805	--	300	0	0	0	40
APR 15...	1515	4	100	0	0	4	40
JUN 22...	1240	1	200	0	10	3	10

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
OCT 19...	2	0	--	--	0	20
APR 15...	12	70	.0	0	0	10
JUN 22...	1	8	.0	1	0	8

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
OCT 19...	1805	.0	.00	.01	.2	.00	.00	.00	.20	.01	.00	.00
APR 15...	1515	.0	.00	.06	.3	.00	.01	.00	.36	.06	.00	.00
JUN 22...	1240	.0	.00	.00	.0	.00	.00	.00	.02	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 19...	.00	.01	.00	.00	.00	.00	.00	0	.00	.00	.01	.00
APR 15...	.00	.00	.01	.09	.00	.00	.00	0	.00	.57	.30	.03
JUN 22...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

## GUADALUPE RIVER BASIN

## 08177800 OLMOS RESERVOIR AT SAN ANTONIO, TX

LOCATION.--Lat 29°28'28", long 98°28'23", Bexar County, Hydrologic Unit 12100301, at left upstream side of dam on Olmos Drive, 0.8 mi (1.3 km) upstream from Hildebrand Street, 1.5 mi (2.4 km) upstream from Brackenridge Park Zoo, and 4.0 mi (6.4 km) downstream from gaging station 08177700, Olmos Creek at Dresden Drive, San Antonio.

DRAINAGE AREA.--32.4 mi<sup>2</sup> (83.9 km<sup>2</sup>).

PERIOD OF RECORD.--June 1968 to September 1971, April 1976 to current year.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level.

REMARKS.--The dam is a concrete gravity-type structure with a maximum height of 50 ft (15 m) and a total length of 1,740 ft (530 m). There is a 24-foot-wide (7.31 m) roadway (Olmos Drive) along the top of the dam. The outlet structure consists of six vertical slide-gate-controlled concrete conduits with entrance dimensions of 6.5 ft (2.0 m) wide by 8.5 ft (2.6 m) high. The gates are maintained and operated by the city of San Antonio Fire Department as required to control downstream floodflow. The reservoir is empty except during flooding when it is used as a detention reservoir. The reservoir has a surface area of about 1,050 acres (424 km<sup>2</sup>) at top of the dam. The dam is owned by the city of San Antonio. The National Weather Service maintains a rain gage and gage-height telemeters at this station. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	728.5	15,500
Design flood.....	725.5	12,600
Floor of gate operating room.....	714.0	5,000
Lowest gated outlet (invert).....	680.0	0

EXTREMES FOR PERIOD OF RECORD.--Maximum elevation, 703.88 ft (214.543 m) May 7, 1976.

EXTREMES FOR CURRENT YEAR.--Maximum elevation during April to September 1976, 703.88 ft (214.543 m) May 7, 1976.  
Maximum elevation during October 1976 to September 1977, 700.73 ft (213.583 m) Apr. 20, 1977.

ELEVATION, IN FEET ABOVE MEAN SEA LEVEL, APRIL TO SEPTEMBER 1976  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1							---	680.39	680.46	680.24	680.18	680.26
2							---	680.29	681.73	680.25	680.16	681.60
3							---	680.50	680.48	680.24	680.09	680.38
4							---	680.27	680.35	682.61	679.98	680.28
5							---	681.36	680.30	681.24	679.87	680.18
6							---	681.14	680.34	687.47	---	680.17
7							---	698.52	680.30	680.68	---	680.15
8							---	681.16	680.29	681.53	680.21	680.05
9							---	681.26	680.11	681.92	680.07	679.91
10							---	680.82	680.20	683.02	679.91	---
11							---	680.63	680.23	681.41	---	---
12							---	682.06	680.20	680.62	---	---
13							---	680.96	680.19	680.72	---	680.52
14							---	680.56	680.14	683.30	---	680.31
15							---	680.47	680.16	680.90	---	680.16
16							---	680.42	680.94	681.90	---	680.14
17							---	680.71	680.46	680.52	---	680.23
18							---	680.39	680.40	680.42	682.17	680.34
19							---	680.45	680.29	680.41	680.42	681.73
20							---	681.56	680.26	680.39	680.44	682.20
21							---	680.56	680.26	680.42	680.44	680.60
22							---	680.46	680.24	680.37	680.35	680.32
23							---	680.40	680.17	680.33	680.32	680.17
24							---	680.40	680.20	680.39	680.20	680.11
25							---	680.39	680.57	680.28	680.03	680.09
26							---	680.80	681.70	680.24	679.83	683.75
27							---	680.39	680.51	680.21	---	680.51
28							---	680.35	680.39	680.21	---	681.28
29							---	680.32	680.31	680.18	681.56	680.44
30							680.54	680.35	680.28	680.18	681.68	680.27
31							---	680.34	---	680.17	680.37	---
MAX							---	698.52	681.73	687.47	---	---
MIN							---	680.27	680.11	680.17	---	---

NOTE.--Elevations below 679.8 ft are not published.

## GUADALUPE RIVER BASIN

295

08177800 OLMOS RESERVOIR AT SAN ANTONIO, TX--Continued

ELEVATION, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	680.21	680.85	680.85	680.87	681.09	681.06	681.34	681.22	683.32	680.30	680.23	---
2	680.18	680.86	680.86	681.18	681.59	681.06	681.35	681.23	680.93	680.30	680.16	680.08
3	680.15	680.86	680.83	680.88	681.16	682.32	681.32	681.15	680.67	680.30	680.22	679.95
4	693.57	680.87	680.94	680.83	681.01	681.55	681.65	681.09	680.60	680.30	680.17	---
5	680.91	680.89	683.14	680.83	680.97	681.41	681.30	681.08	680.56	680.30	680.16	---
6	680.33	680.93	681.15	680.94	680.99	681.46	681.21	681.06	680.54	680.30	680.12	681.19
7	680.24	680.92	680.90	680.81	680.98	681.45	681.17	681.05	680.49	680.30	680.08	680.54
8	680.35	681.02	680.78	680.89	681.21	681.36	681.15	681.03	680.46	680.30	679.99	680.36
9	680.21	680.99	680.82	681.00	681.01	681.33	681.16	681.47	680.42	680.30	679.91	680.34
10	680.29	680.97	680.79	680.83	681.95	681.29	681.17	681.09	680.40	680.30	---	680.27
11	680.28	680.99	681.09	680.82	681.42	681.28	681.12	681.40	680.37	680.30	680.02	680.12
12	680.37	681.12	681.68	682.55	681.14	681.22	681.14	681.07	680.48	680.30	679.99	681.45
13	680.19	681.04	681.40	681.66	681.05	681.20	682.23	681.10	680.41	680.30	679.87	681.75
14	680.16	680.90	681.11	681.05	681.03	681.20	681.94	681.07	680.34	680.23	679.81	680.40
15	693.20	680.85	680.87	680.88	681.03	681.18	681.74	681.06	680.98	680.18	---	680.27
16	681.14	680.95	680.82	680.81	681.04	681.21	681.42	681.04	680.38	680.24	680.24	680.20
17	680.44	680.87	680.83	680.81	681.03	681.15	680.91	681.04	680.31	680.17	680.14	680.15
18	680.37	681.14	680.88	680.79	681.08	681.04	680.76	681.00	680.32	680.16	680.03	680.14
19	680.90	681.58	681.23	680.77	681.10	680.99	698.05	680.97	680.20	680.19	680.13	680.12
20	680.76	681.02	680.91	680.77	681.12	680.99	694.23	680.96	680.20	680.39	680.02	680.13
21	680.46	680.86	680.87	680.78	681.14	680.98	681.44	681.56	680.45	680.22	680.07	680.12
22	680.47	680.83	680.85	685.97	681.17	680.99	681.30	681.06	681.55	680.19	680.03	680.16
23	680.50	680.78	680.83	681.33	681.19	680.92	681.19	680.98	681.61	680.25	679.91	680.27
24	682.88	680.81	680.86	681.11	681.16	681.16	681.20	681.08	680.50	680.20	---	680.20
25	680.92	684.06	681.01	681.00	681.15	681.09	681.24	680.92	680.39	680.17	---	680.14
26	680.48	681.43	680.90	680.94	681.12	681.85	681.17	680.90	680.37	680.16	---	680.11
27	680.64	681.07	680.88	680.92	681.14	681.90	681.16	680.87	680.36	680.17	---	680.12
28	680.87	681.42	680.90	680.91	681.06	681.46	681.13	680.84	680.36	680.14	---	680.10
29	680.17	681.08	680.84	680.92	---	681.33	681.15	680.84	680.30	680.24	---	680.04
30	680.85	680.86	680.83	683.27	---	681.25	681.44	680.77	680.30	680.20	679.99	679.96
31	680.83	---	680.82	681.17	---	681.22	---	680.79	---	680.17	679.97	---
MAX	693.57	684.06	683.14	685.97	681.95	682.32	698.05	681.56	683.32	680.39	---	---
MIN	680.15	680.78	680.78	680.77	680.97	680.92	680.76	680.77	680.20	680.14	---	---

NOTE.--Elevations below 679.8 ft are not published.

## GUADALUPE RIVER BASIN

## 08178000 SAN ANTONIO RIVER AT SAN ANTONIO, TX

LOCATION.--Lat 29°24'34", long 98°29'41", Bexar County, Hydrologic Unit 12100301, on left bank 193 ft (59 m), downstream from South Alamo Street Bridge in San Antonio, 2.1 mi (3.4 km) upstream from San Pedro Creek, and 230.6 mi (371.1 km) upstream from mouth.

DRAINAGE AREA.--41.8 mi<sup>2</sup> (108.3 km<sup>2</sup>). Flow of river comes from intermittent spring flow and from artesian wells; drainage area of stream not applicable.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1915 to November 1929, February 1939 to current year. Ground-water discharge into river is discussed by Petit and George, Texas Board of Water Engineers Bull. 5608, vol. 1 (1956, p. 45). December 1895 to June 1906, periodic discharge measurements only.

REVISED RECORDS.--WSP 1312: 1917. WSP 1923: Drainage area. WDR TX-72-1: 1971(m).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 605.26 ft (184.483 m) above mean sea level. Jan. 26, 1915, to Feb. 27, 1916, nonrecording gage at site 1.3 mi (2.1 km) upstream at different datum. Feb. 28, 1916, to Apr. 7, 1920, nonrecording gage at site 1.1 mi (1.8 km) upstream at different datum. Apr. 8, 1920, to Nov. 16, 1929, and Feb. 15, 1939, to Apr. 25, 1967, water-stage recorder in vicinity of South Alamo Street Bridge at 7.00 ft (2.134 m) higher datum. Apr. 25, 1967, to May 13, 1969, water-stage recorder at site 307 ft (94 m) downstream at same datum.

REMARKS.--Water-discharge records good. Floodflow is regulated by Olmos flood-control reservoir, capacity 15,500 acre-ft (19.1 hm<sup>3</sup>) about 8.5 mi (13.7 km) upstream. Dam completed in 1926. Springs emerge intermittently from the Edwards and associated limestones along the Balcones Fault Zone. City of San Antonio rain-gage and gage-height telemeters at station.

AVERAGE DISCHARGE.--52 years, 54.7 ft<sup>3</sup>/s (1.549 m<sup>3</sup>/s), 17.77 in/yr (451 mm/yr), 39,630 acre-ft/yr (48.9 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,300 ft<sup>3</sup>/s (433 m<sup>3</sup>/s) Sept. 10, 1921, gage height, 20.14 ft (6.139 m), from floodmark, at former site and datum, from rating curve extended above 2,000 ft<sup>3</sup>/s (56.6 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow at times due to regulation.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1819, that of Sept. 10, 1921; flood of July 5, 1819, equaled or exceeded that of Sept. 10, 1921.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,940 ft<sup>3</sup>/s (54.9 m<sup>3</sup>/s) Oct. 10, gage height, 10.50 ft (3.200 m); no flow at times, due to regulation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	186	174	183	232	183	173	220	198	122	62	49
2	64	188	174	195	231	189	193	220	173	120	53	51
3	66	189	180	188	227	231	183	200	125	120	57	50
4	211	178	184	185	235	196	183	209	125	122	56	47
5	328	172	321	183	229	194	168	204	122	122	49	48
6	66	171	233	186	223	193	167	201	120	117	47	161
7	75	171	184	183	223	179	164	202	117	117	47	53
8	89	175	180	184	237	193	163	201	111	108	45	66
9	66	168	178	189	229	184	163	309	117	102	54	67
10	74	168	181	183	241	202	160	149	108	97	46	66
11	77	167	189	181	254	194	160	238	108	100	38	63
12	74	182	230	241	225	174	159	149	100	97	35	101
13	74	197	208	284	198	181	183	170	97	124	34	167
14	74	175	205	177	200	181	174	184	86	81	38	79
15	325	172	193	187	200	180	266	173	86	92	43	77
16	302	192	190	184	214	179	458	173	89	86	43	85
17	102	232	187	187	218	179	186	151	84	84	42	82
18	92	182	189	183	218	178	181	167	77	89	41	81
19	321	339	199	181	220	191	384	167	72	84	40	98
20	120	176	194	181	214	180	1170	170	74	86	41	82
21	108	174	187	182	199	175	500	362	70	89	47	68
22	111	172	187	319	223	158	221	176	127	82	51	85
23	117	171	187	363	212	164	217	187	192	79	49	86
24	268	171	187	195	216	173	217	170	122	74	46	85
25	142	219	200	201	195	175	208	144	120	77	43	80
26	141	176	189	199	202	184	214	157	125	68	37	78
27	146	178	189	202	201	193	215	154	111	62	40	74
28	244	178	186	202	201	186	226	154	122	64	43	70
29	742	176	184	199	---	176	223	151	122	62	52	68
30	308	172	185	354	---	173	243	149	125	66	49	68
31	188	---	183	232	---	172	---	146	---	64	49	---
TOTAL	5174	5567	6037	6493	6117	5690	7522	5807	3425	2857	1417	2335
MEAN	167	186	195	209	218	184	251	187	114	92.2	45.7	77.8
MAX	742	339	321	363	254	231	1170	362	198	124	62	167
MIN	59	167	174	177	195	158	159	144	70	62	34	47
CFSM	4.00	4.45	4.67	5.00	5.22	4.40	6.01	4.47	2.73	2.21	1.09	1.86
IN.	4.60	4.95	5.37	5.78	5.44	5.06	6.69	5.17	3.05	2.54	1.26	2.08
AC-FT	10260	11040	11970	12880	12130	11290	14920	11520	6790	5670	2810	4630
CAL YR 1976	TOTAL	33733.3	MEAN	92.2	MAX	1180	MIN	6.5	CFSM	2.21	IN	30.02
WTR YR 1977	TOTAL	58441.0	MEAN	160	MAX	1170	MIN	34	CFSM	3.83	IN	52.01
									AC-FT	66910	AC-FT	115900

GUADALUPE RIVER BASIN

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08178000 SAN ANTONIO RIVER AT SAN ANTONIO, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1968 to current year.

REMARKS.--Peak discharges for storm events during which water-quality samples were obtained are given in the following table:

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)		Gage height (ft) (m)		Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)		Gage height (ft) (m)	
Apr. 20	0845	1,800	60.0	10.28	3.133	June 22	1545	678	19.2	8.30	2.530

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE	SPE- CIFIC CON- DUCT- ANCE	PH	TEMPER- ATURE	COLOR (PLAT- INUM- COBALT	TUR- BID- ITY	DIS- SOLVED OXYGEN	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND	IMME- DIATE COLI- FORM	FECAL COLI- FORM
DATE	TIME	(CFS)	(MICRO- MHOS)	(UNITS)	(DEG C)	(UNITS)	(JTU)	(MG/L)		5 DAY (MG/L)	(COL. PER 100 ML)	(COL./ 100 ML)
APR 20...	1330	1250	238	--	20.0	55	240	8.8	100	4.0	120000	96000
JUN 22...	1100	100	472	7.6	28.0	0	4	7.8	101	1.4	68000	8800
	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
APR 20...	130000	110	13	36	4.8	5.4	.2	3.8	118	0	14	6.7
JUN 22...	3200	240	28	70	16	11	.3	1.5	260	0	22	17
DATE	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHY- LENE BLUE ACTIVE SUB- STANCE (MG/L)
APR 20...	.1	8.8	138	438	72	.86	.02	.11	1.1	.38	8.8	.00
JUN 22...	.2	12	278	10	3	1.4	.01	.01	.24	.05	2.2	.00



## GUADALUPE RIVER BASIN

08178000 SAN ANTONIO RIVER AT SAN ANTONIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CAD- MIUM (CD) (UG/L)	DIS-SOLVED CHRO- MIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)					
DATE	TIME											
APR 20...	1330	3	0	0	12	0	20					
JUN 22...	1100	1	200	0	0	1	10					
		DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN- GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELE- NIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)					
DATE												
APR 20...		0	0	.0	0	0	10					
JUN 22...		1	8	.0	0	0	4					
DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
APR 20...	1330	.0	.00	.00	.8	.00	.02	.03	.40	.04	.00	.00
JUN 22...	1100	.0	.00	.00	.0	.00	.00	.00	.03	.00	.00	.00
DATE		TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
APR 20...		.00	.02	.01	.02	.00	.00	.00	0	.00	.02	.13
JUN 22...		.00	.00	.00	.00	.00	.00	.00	0	.00	.05	.02

## GUADALUPE RIVER BASIN

299

08178300 ALAZAN CREEK AT ST. CLOUD STREET, SAN ANTONIO, TX  
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°27'29", long 98°32'59", Bexar County, Hydrologic Unit 12100301, at bridge on St. Cloud Street in San Antonio and 1.5 mi (2.4 km) upstream from Woodlawn Lake Dam.

DRAINAGE AREA.--3.26 mi<sup>2</sup> (8.44 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Digital recorders (water stage and rainfall). Gage not referenced to mean sea level.

REMARKS.--Additional storm rainfall-runoff data for this site can be obtained from the report "Hydrologic Data for Urban Studies in the San Antonio, Texas Metropolitan Area, 1977."

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,380 ft<sup>3</sup>/s (124 m<sup>3</sup>/s) May 8, 1975, elevation, 16.08 ft (4.901 m).

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 400 ft<sup>3</sup>/s (11.3 m<sup>3</sup>/s), revised, and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Elevation (ft)	(m)	Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Elevation (ft)	(m)
Oct. 4	2125	*1,200	34.0	10.08	3.072	May 21	0625	810	22.9	8.98	2.737
Apr. 19	2050	1,100	31.2	9.81	2.990	June 23	1615	a100	2.83	5.44	1.658
Apr. 20	0635	895	25.3	9.24	2.816	Sept. 6	1005	a77	2.18	5.24	1.597

a Water-quality samples obtained on this flood event.

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: November 1968 to current year. Sediment analyses: September 1970 to September 1973. Water temperatures: November 1968 to current year. Bacteria analyses: December 1975 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. / 100 ML)	
APR 19...	2217	144	138	7.7	20.0	100	220	8.1	92	5.4	160000	71000	
JUN 23...	1610	66	150	7.4	23.5	70	150	7.4	89	3.9	150000	79000	
SEP 06...	1250	6.4	373	7.1	23.5	80	140	7.5	90	5.8	510000	250000	
DATE	100 ML	FECAL STREPTOCOCCI (COL. PER 100 ML)	HARDNESS (CA, MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
APR 19...	210000	51	3	18	1.4	5.6	.3	4.1	58	0	13	4.4	
JUN 23...	140000	58	9	21	1.3	6.2	.4	2.4	60	0	11	6.0	
SEP 06...	67000	150	17	47	7.5	16	.6	2.9	160	0	38	18	
DATE	(MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)
APR 19...	.1	6.7	82	480	108	.51	.02	.16	1.7	.40	11	.00	
JUN 23...	.1	3.8	81	214	60	.20	.01	.06	.43	.24	12	.00	
SEP 06...	.3	9.2	218	198	48	1.1	.05	.01	.67	.24	11	.20	

## GUADALUPE RIVER BASIN

08178300 ALAZAN CREEK AT ST. CLOUD STREET, SAN ANTONIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
APR 19...	2217	2	100	0	12	3	100
JUN 23...	1610	1	0	0	0	2	50
SEP 06...	1250	2	100	0	0	3	30

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
APR 19...	19	10	.0	0	0	10
JUN 23...	24	0	.0	0	0	10
SEP 06...	9	10	.0	0	0	10

DATE	TIME	TOTAL PCB (UG/L)	POLY-CHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)
APR 19...	2217	.0	.00	.00	.2	.00	.01	.05
JUN 23...	1610	.0	.00	.00	.0	.00	.00	.00
SEP 06...	1250	.0	.00	.00	.0	.00	.00	.01

DATE	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALATHION (UG/L)	TOTAL METHOXY- CHLOR (UG/L)
APR 19...	.27	.03	.00	.00	.01	.02	.01	.00	--
JUN 23...	.00	.00	.00	.00	.00	.00	.00	.00	--
SEP 06...	.05	.01	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
APR 19...	.00	.00	.00	0	.00	.02	.16	.00
JUN 23...	.00	.00	.00	0	.00	.00	.26	.00
SEP 06...	.00	.00	.00	0	.00	.00	.30	.00

GUADALUPE RIVER BASIN

301

08178600 PANTHER SPRINGS CREEK AT FARM ROAD 2696 NEAR SAN ANTONIO, TX  
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°37'31", Long 98°31'06", Bexar County, Hydrologic Unit 12100301, at culvert on Farm Road 2696, 1.3 mi (2.1 km) north of intersection of Farm Roads 2696 and 1604, and 5.5 mi (8.8 km) north of San Antonio.

DRAINAGE AREA.--9.54 mi<sup>2</sup> (24.71 km<sup>2</sup>).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1968 to September 1977 (discontinued).

GAGE.--Digital recorders (water stage and rainfall). Gage not referenced to mean sea level.

REMARKS.--Additional storm rainfall-runoff data for this site can be obtained from the report "Hydrologic Data for Urban Studies in the San Antonio, Texas Metropolitan Area, 1977." After August 1976, flow from 8.86 mi<sup>2</sup> (22.95 km<sup>2</sup>) was controlled by a floodwater-retarding structure with a capacity of 3,293 acre-ft (4.06 hm<sup>3</sup>) below the flood-spillway crest, of which 198 acre-ft (0.244 hm<sup>3</sup>) is conservation-pool capacity.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,610 ft<sup>3</sup>/s (244 m<sup>3</sup>/s) May 11, 1972, elevation, 9.53 ft (2.905 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 152 ft<sup>3</sup>/s (4.30 m<sup>3</sup>/s) Oct. 24, elevation, 5.20 ft (1.585 m), no peak above base of 200 ft<sup>3</sup>/s (5.66 m<sup>3</sup>/s).

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: May 1969 to September 1977 (discontinued). Water temperatures: May 1969 to September 1977 (discontinued). Bacteria analyses: April 1976 to September 1977 (discontinued).

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	
OCT 24...	1035	125	114	7.5	18.0	220	120	8.6	93	2.0	75000	30000	
DATE	TIME	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT 24...	66000	51	0	19	.9	1.5	.1	2.7	70	0	4.4	2.9	
DATE	TIME	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)
OCT 24...	.2	7.7	74	200	36	.08	.01	.02	.94	.13	6.2	.00	

## GUADALUPE RIVER BASIN

08178600 PANTHER SPRINGS CREEK AT FARM ROAD 2696 NEAR SAN ANTONIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

				DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)				
DATE	TIME												
OCT 24...	1035			0	100	0	0	0	40				
		DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)						
	DATE												
	OCT 24...			0	0	.0	0	0	0				
DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	
OCT 24...	1035	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00	
DATE	TIME	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 24...		.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

GUADALUPE RIVER BASIN

303

08178640 WEST ELM CREEK AT SAN ANTONIO, TX  
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°37'23", long 98°26'29", Bexar County, Hydrologic Unit 12100301, at mid-channel, 1.8 mi (2.9 km) upstream from East Elm Creek, 2.1 mi (3.4 km) upstream from Farm Road 1604, and 7.0 mi (11.3 km) north of San Antonio International Airport.

DRAINAGE AREA.--2.45 mi<sup>2</sup> (6.35 km<sup>2</sup>).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1976 to current year.

GAGE.--Digital recorders (water stage and rainfall). Gage not referenced to mean sea level.

REMARKS.--Additional storm rainfall-runoff data for this site can be obtained from the report "Hydrologic Data for Urban Studies in the San Antonio, Texas Metropolitan Area, 1977."

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 335 ft<sup>3</sup>/s (9.49 m<sup>3</sup>/s) Sept. 28, 1976, gage height, 4.30 ft (1.311 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Elevation (ft)	Elevation (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Elevation (ft)	Elevation (m)
Oct. 24	0505	*215	6.09	4.00	1.219	Oct. 29	0750	138	3.91	3.73	1.137

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, pesticide and bacteria analyses: May 1976 to current year. Water temperatures: May 1976 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	CHEMICAL OXYGEN DEMAND (LOW LEVEL) (MG/L)
APR 19...	2315	13	106	7.7	19.5	120	25	7.4	83	50
DATE	TIME	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL./100 ML)	FECAL COLIFORM (COL./100 ML)	FECAL STREPTOCOCCI KF AGAR (COL./100 ML)	NON-CARBONATE HARDNESS (CA+MG) (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO
APR 19...	3.5	77000	52000	130000	52	1	20	.5	1.4	.1
DATE	TIME	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)
APR 19...	3.5	62	0	3.7	2.0	.0	13	75	40	
DATE	TIME	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	OIL AND GREASE (MG/L)
APR 19...	17	.07	.01	.06	.83	.17	7.9	.00	1	



## GUADALUPE RIVER BASIN

08178640 WEST ELM CREEK AT SAN ANTONIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)				
DATE	TIME											
APR 19...	2315	2	100	0	13	2	50	2				
		DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED VANADIUM (V) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)				
DATE	TIME											
APR 19...		0	.0	0	0	0	10	10				
DATE	TIME	TOTAL PCB (UG/L)	POLY-CHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
APR 19...	2315	.0	.00	.00	.0	.01	.01	.02	.00	.00	.00	.00
DATE	TIME	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL HEPTACHLOR LINDANE (UG/L)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
APR 19...		.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

## GUADALUPE RIVER BASIN

305

08178645 EAST ELM CREEK AT SAN ANTONIO, TX  
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°37'04", long 98°25'41", Bexar County, Hydrologic Unit 12100301, at mid-channel, 2.1 mi (3.4 km) upstream from West Elm Creek, 2.4 mi (3.9 km) upstream from Farm Road 1604, and 6.9 mi (11.1 km) north of San Antonio International Airport.

DRAINAGE AREA.--2.33 mi<sup>2</sup> (6.03 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1975 to current year.

GAGE.--Digital recorders (water stage and rainfall). Gage not referenced to mean sea level.

REMARKS.--Additional storm rainfall-runoff data for this site can be obtained from the report "Hydrologic Data for Urban Studies in the San Antonio, Texas Metropolitan Area, 1977."

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 310 ft<sup>3</sup>/s (8.78 m<sup>3</sup>/s) May 7, 1976, elevation, 6.78 ft (2.067 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)		Elevation (ft) (m)		Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)		Elevation (ft) (m)	
Oct. 29	0815	117	3.31	5.04	1.536	Apr. 19	2200	*190	5.38	5.73	1.747
Apr. 16	0850	102	2.89	4.89	1.490						

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, pesticide and bacteria analyses: May 1976 to current year. Water temperatures: May 1976 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	CHEMICAL OXYGEN DEMAND (LOW LEVEL) (MG/L)
APR 20...	1010	52	99	7.9	19.0	140	20	5.6	62	34
		BIOCHEMICAL OXYGEN DEMAND 5 DAY PER (MG/L)	IMMEDIATE COLIFORM (COL./100 ML)	FECAL STREPTOCOCCI KF AGAR (COL./100 ML)	HARDNESS (CA, MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO
APR 20...	2.7	16000	4400	16000	57	9	21	1.1	1.0	.1
		DISSOLVED PHOSPHORUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SI02) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)
APR 20...	3.3	58	0	3.5	1.4	.0	18	78	31	
		VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	OIL AND GREASE (MG/L)
APR 20...	16	.02	.01	.01	1.2	.04	7.8	.00	1	

## GUADALUPE RIVER BASIN

08178645 EAST ELM CREEK AT SAN ANTONIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)				
DATE	TIME	APR 20...	1010	0	0	0	13	0	40	4		
		DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED NICKEL (NI) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED VANADIUM (V) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)				
DATE	TIME	APR 20...		0	.0	0	0	0	3.0	10		
DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLORINATED NAPHTHA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
APR 20...	1010	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
DATE	TIME	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRIETHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
APR 20...		.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

GUADALUPE RIVER BASIN

307

08178690 SALADO CREEK TRIBUTARY AT BITTERS ROAD, SAN ANTONIO, TX  
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°31'36", long 98°26'25", Bexar County, Hydrologic Unit 12100301, at culvert on Bitters Road immediately east of MacArthur High School in San Antonio.

DRAINAGE AREA.--0.26 mi<sup>2</sup> (0.67 km<sup>2</sup>).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Digital recorders (water stage and rainfall). Gage not referenced to mean sea level.

REMARKS.--Additional storm rainfall-runoff data for this site can be obtained from the report "Hydrologic Data for Urban Studies in the San Antonio, Texas Metropolitan Area, 1977."

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 253 ft<sup>3</sup>/s (7.16 m<sup>3</sup>/s) May 7, 1972, elevation, 7.88 ft (2.402 m).

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 50 ft<sup>3</sup>/s (1.42 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Elevation (ft)	Elevation (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Elevation (ft)	Elevation (m)
Oct. 4	2135	105	2.97	4.95	1.509	Apr. 19	2005	*167	4.73	6.15	1.875
Oct. 15	1535	50	1.42	3.82	1.164	Apr. 20	0850	125	3.54	5.36	1.634
Oct. 19	1140	a40	1.13	3.60	1.097	May 21	0610	70	1.98	4.24	1.292
Apr. 13	1735	62	1.76	4.08	1.244	June 23	1415	a45	1.27	3.71	1.131
Apr. 15	1445	50	1.42	3.83	1.167						

a Water-quality samples obtained on this flood event.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: November 1968 to current year. Sediment analyses: April to September 1973. Water temperatures: November 1968 to current year. Bacteria analyses: April 1976 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (7UM-MF (COL./ 100 ML)	
OCT 19...	1330	21	64	6.2	13.0	55	10	10.1	99	2.7	84000	22000	
APR 15...	1355	17	127	7.6	18.0	25	20	6.6	72	5.7	130000	14000	
20...	0025	28	173	7.1	19.5	30	15	7.6	85	3.4	250000	38000	
JUN 23...	1437	29	60	7.3	24.0	30	20	6.8	83	3.4	220000	110000	
		FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	
OCT 19...	110000	26	0	9.9	.2	1.0	.1	2.7	32	0	5.6	2.4	
APR 15...	170000	52	5	19	1.0	4.3	.3	2.6	57	0	4.4	6.6	
20...	290000	75	10	27	1.9	3.7	.2	4.6	79	0	13	4.1	
JUN 23...	150000	25	0	9.6	.3	1.2	.1	2.1	33	0	3.6	1.8	
		DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHY- LENE BLUE ACTIVE SUB- STANCE (MG/L)
OCT 19...	.4	2.5	40	10	3	.18	.01	.09	.27	.30	5.2	.00	
APR 15...	.0	2.0	68	40	21	2.0	.02	.18	3.3	.21	6.0	.10	
20...	.0	6.4	100	30	10	1.3	.04	.20	.80	.60	8.1	.10	
JUN 23...	.0	1.1	36	49	17	.14	.01	.07	.56	.24	7.5	.10	

## GUADALUPE RIVER BASIN

08178690 SALADO CREEK TRIBUTARY AT BITTERS ROAD, SAN ANTONIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
APR 15...	1355	1	100	0	1	6	40
20...	0025	1	0	0	12	2	30
JUN 23...	1437	0	0	0	10	2	50

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
APR 15...	48	10	.0	0	0	20
20...	16	10	.0	0	0	10
JUN 23...	84	4	.0	1	0	40

		POLY-CHLORINATED NAPH-THA-LENES										
DATE	TIME	TOTAL PCB (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR-DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	
OCT 19...	1330	.0	.00	.00	.1	.00	.00	.00	.06	.01	.00	
APR 15...	1355	.0	.00	.00	.1	.00	.00	.01	.46	.01	.00	
20...	0025	.0	.00	.00	.2	.00	.01	.02	.30	.04	.00	
DATE	TIME	TOTAL HEPTA-CHLOR (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA-THION (UG/L)	TOTAL METHYL PARA-THION (UG/L)	TOTAL METHYL TRI-THION (UG/L)	TOTAL PARA-THION (UG/L)	TOTAL TOX-APHENE (UG/L)	TOTAL TRI-THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 19...	.00	.03	.00	.00	.00	.00	.00	0	.00	.00	.08	.00
APR 15...	.00	.00	.01	.00	.00	.00	.00	0	.00	.00	.07	.00
20...	.00	.04	.01	.03	.00	.00	.00	0	.00	.13	.15	.00

## 08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX

LOCATION.--Lat 29°30'57", Long 98°25'51", Bexar County, Hydrologic Unit 12100301, on upstream side of upstream bridge of two bridges on Interstate Highway 410 in San Antonio, 1.0 mi (1.6 km) west of Northeast School, 1.1 mi (1.8 km) upstream from Perrin-Beitel Creek, and 2.7 mi (4.3 km) east of San Antonio International Airport.

DRAINAGE AREA.--137 mi<sup>2</sup> (355 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1960 to current year.

GAGE.--Water-stage recorder with concrete control. Datum of gage is 684.60 ft (208.666 m) above mean sea level.

REMARKS.--Water-discharge records good. No known diversion above station. Recording rain gage located at station with five additional recording rain gages located in watershed. Flow is affected at times by discharge from flood-detention pools of seven floodwater-retarding structures with combined detention capacity of 17,390 acre-ft (21.4 hm<sup>3</sup>). These structures control runoff from 48.4 mi<sup>2</sup> (125.4 km<sup>2</sup>) above this station.

AVERAGE DISCHARGE.--17 years, 9.38 ft<sup>3</sup>/s (0.266 m<sup>3</sup>/s), 0.93 in/yr (24 mm/yr), 6,800 acre-ft/yr (8.38 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,900 ft<sup>3</sup>/s (705 m<sup>3</sup>/s) May 12, 1972, gage height, 15.22 ft (4.639 m), from rating curve extended above 8,000 ft<sup>3</sup>/s (227 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1853, 23 to 24 ft (7.0 to 7.3 m) in October 1913. Flood in September 1921 reached a stage of 18 ft (5.5 m), and flood of Sept. 27, 1946, reached a stage of 18.2 ft (5.55 m), and are the highest since 1899.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 150 ft<sup>3</sup>/s (4.25 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 4	2400	242	6.85	4.36	1.329	Apr. 16	1100	297	8.41	4.76	1.451
Oct. 19	1445	210	5.95	4.14	1.262	Apr. 20	1030	*2,720	77.0	a8.22	2.505
Oct. 29	1230	1,050	29.7	7.04	2.146						

a From high-water mark.

Minimum discharge, 0.02 ft<sup>3</sup>/s (0.001 m<sup>3</sup>/s) July 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	14	7.0	5.8	11	5.3	4.4	11	3.4	8.0	2.6	.32
2	2.1	13	8.6	7.2	11	5.3	4.1	9.3	4.1	7.7	3.8	2.7
3	2.2	14	6.6	6.7	13	6.3	4.0	10	5.4	5.8	6.6	4.9
4	20	12	6.6	6.0	7.9	7.5	5.0	9.5	6.0	2.1	5.7	4.6
5	39	8.2	22	5.5	7.1	5.4	4.2	11	5.2	2.6	4.8	.74
6	5.4	4.5	29	6.3	6.7	5.3	5.7	11	4.7	5.7	1.2	.44
7	4.0	12	10	5.8	7.1	5.1	5.0	10	4.0	5.9	.40	.26
8	3.8	11	7.9	5.2	11	4.8	4.9	8.9	4.2	5.0	.23	5.1
9	2.9	7.5	7.3	5.4	8.7	4.6	4.9	7.2	4.6	2.4	5.2	1.7
10	2.4	7.5	7.0	4.8	11	4.7	4.9	6.9	5.5	2.4	5.3	3.0
11	2.4	7.0	8.6	5.3	26	4.6	4.8	9.5	5.1	3.5	5.3	2.5
12	2.2	7.0	15	9.1	14	4.2	4.9	7.9	2.4	5.6	5.0	2.3
13	2.4	9.8	11	21	10	4.2	11	7.4	4.1	6.6	1.5	8.1
14	1.7	6.6	11	12	9.0	4.5	14	6.6	2.3	2.0	.47	3.9
15	41	6.6	8.1	7.5	6.9	4.6	15	6.6	4.1	1.7	.15	1.1
16	34	6.6	7.2	6.7	7.1	4.3	94	6.6	2.8	6.1	4.6	2.1
17	9.0	12	7.1	6.4	6.6	4.3	13	6.6	2.6	6.6	2.1	4.2
18	4.5	8.0	7.4	6.1	6.3	4.4	6.8	6.6	2.4	5.7	5.9	.45
19	42	28	9.0	6.1	5.7	4.6	64	6.4	2.3	5.7	5.7	1.0
20	14	12	8.3	6.1	5.4	5.0	1140	6.1	4.5	1.6	5.7	5.5
21	7.1	9.2	6.7	6.2	7.1	4.6	64	19	3.8	1.2	1.2	1.7
22	6.6	6.6	7.0	15	8.0	5.0	18	6.7	6.1	5.6	.83	5.9
23	5.9	7.0	6.9	32	7.0	4.7	12	5.3	13	5.3	4.3	5.9
24	27	7.5	6.6	12	5.8	1.0	10	6.0	7.8	5.3	1.2	1.3
25	13	8.6	6.7	8.8	5.4	5.3	9.7	5.7	4.5	5.3	4.3	.62
26	8.3	11	6.2	8.8	5.7	5.5	9.7	5.7	4.0	5.3	.55	.62
27	9.1	7.0	5.8	7.7	5.7	6.7	9.0	5.7	4.8	3.6	.20	.61
28	19	6.6	6.0	8.0	5.6	6.3	8.9	5.6	5.4	.76	1.9	1.4
29	510	4.9	5.7	6.1	---	5.3	10	5.2	9.1	.24	1.9	2.8
30	77	3.4	5.9	20	---	5.3	13	4.2	5.1	.08	1.2	3.4
31	23	---	5.9	19	---	4.8	---	3.7	---	.05	3.2	---
TOTAL	943.7	279.1	274.1	288.6	241.8	153.5	1578.9	237.9	143.3	125.43	93.03	79.16
MEAN	30.4	9.30	8.84	9.31	8.64	4.95	52.6	7.67	4.78	4.05	3.00	2.64
MAX	510	28	29	32	26	7.5	1140	19	13	8.0	6.6	8.1
MIN	1.7	3.4	5.7	4.8	5.4	1.0	4.0	3.7	2.3	.05	.15	.26
CFSM	.22	.07	.07	.07	.06	.04	.38	.06	.04	.03	.02	.02
IN.	.26	.08	.07	.08	.07	.04	.43	.06	.04	.03	.03	.02
AC-FT	1870	554	544	572	480	304	3130	472	284	249	185	157
(††)	10.33	2.57	2.10	3.49	1.01	1.26	6.46	2.24	2.31	.16	.68	2.31

CAL YR 1976 TOTAL 3794.64 MEAN 10.4 MAX 1350 MIN .00 CFSM .08 IN 1.03 AC-FT 7530 †† 47.57  
WTR YR 1977 TOTAL 4438.52 MEAN 12.2 MAX 1140 MIN .05 CFSM .09 IN 1.21 AC-FT 8800 †† 34.92

†† Weighted-mean rainfall, in inches, based on five rain gages.



## GUADALUPE RIVER BASIN

08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1968 to current year. Sediment analyses: October 1972 to September 1973.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (7UM-MF (COL./ 100 ML)
DATE	TIME											
OCT												
19...	1425	32	669	7.8	17.5	20	50	8.3	89	2.6	4800	1300
19...	1615	172	348	7.8	15.5	70	500	9.1	94	4.4	77000	30000
24...	1430	32	475	7.5	18.5	50	190	7.3	80	2.8	60000	23000
APR												
20...	0105	845	242	8.0	19.0	110	360	6.5	72	6.4	160000	60000
JUN												
22...	0907	2.5	825	7.3	25.5	0	8	6.1	76	1.3	3200	60
	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
DATE	100 ML											
OCT												
19...	2800	240	33	87	6.5	26	.7	60	258	0	120	27
19...	110000	--	--	--	--	--	--	--	--	--	--	--
24...	110000	--	--	--	--	--	--	--	--	--	--	--
APR												
20...	190000	76	0	28	1.4	11	.6	8.5	94	0	21	12
JUN												
22...	860	250	36	84	9.6	38	1.0	75	260	0	150	39
	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHY- LENE BLUE ACTIVE SUB- STANCE (MG/L)
OCT												
19...	.2	15	469	58	8	.85	.05	.15	.64	.15	5.0	.10
19...	--	--	--	724	172	--	--	--	--	--	--	--
24...	--	--	--	240	52	--	--	--	--	--	--	--
APR												
20...	.2	9.8	138	1980	264	.32	.02	.08	3.2	1.2	13	.00
JUN												
22...	.6	14	539	17	7	.03	.00	.07	.23	.04	3.2	.10

GUADALUPE RIVER BASIN

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08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CAD- MIUM (CD) (UG/L)	DIS-SOLVED CHRO- MIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT 19...	1425	3	200	0	0	0	100
APR 20...	0105	2	100	0	17	2	40
JUN 22...	0907	1	100	0	10	1	20

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN- GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELE- NIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT 19...	2	10	.2	1	0	10
APR 20...	2	0	.4	0	0	10
JUN 22...	0	0	.0	2	0	4

DATE	TIME	TOTAL PCP (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
OCT 19...	1425	.0	.00	.00	.0	.00	.00	.00	.01	.00	.00	.00
APR 20...	0105	.0	.00	.00	.0	.00	.00	.00	.69	.00	.00	.00
JUN 22...	0907	.0	.00	.00	.0	.00	.00	.00	.01	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 19...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.01	.00
APR 20...	.00	.00	.00	.00	.00	.00	.00	0	.00	.08	1.0	.03
JUN 22...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

## GUADALUPE RIVER BASIN

08178736 SALADO CREEK TRIBUTARY AT BEE STREET, SAN ANTONIO, TX  
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°26'37", long 98°27'13", Bexar County, Hydrologic Unit 12100301, 76 ft (23 m) downstream from culvert at intersection of Bee and Shirley Streets in San Antonio and 0.25 mi (0.40 km) north of Pershing Elementary School.

DRAINAGE AREA.--0.45 mi<sup>2</sup> (1.17 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1969 to April 1977 (discontinued).

GAGE.--Digital recorders (water stage and rainfall). Gage not referenced to mean sea level. Prior to Sept. 29, 1971, at site 104 ft (32 m) upstream at same datum.

REMARKS.--Additional storm rainfall-runoff data for this site can be obtained from the report "Hydrologic Data for Urban Studies in the San Antonio, Texas Metropolitan Area, 1977."

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 515 ft<sup>3</sup>/s (14.6 m<sup>3</sup>/s) June 8, 1975, gage height, 9.01 ft (2.746 m).

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 60 ft<sup>3</sup>/s (1.70 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 4	2135	146 4.13	5.84 1.780	Apr. 19	2150	*185 5.24	6.24 1.902

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: September 1970 to April 1977 (discontinued). Sediment analyses: April to September 1973. Water temperatures: September 1970 to April 1977. Bacteria analyses: December 1975 to April 1977 (discontinued).

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. / 100 ML)	
APR 19...	2155	289	120	8.1	19.0	110	230	9.1	101	4.4	72000	34000	
DATE	TIME	FECAL STREP-TOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	
APR 19...	93000		29	4	10	1.0	5.3	.4	1.9	30	0	14	2.8
DATE	TIME	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)
APR 19...	.1		3.0	53	848	228	.31	.03	.18	1.7	.38	12	.00

GUADALUPE RIVER BASIN

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08178736 SALADO CREEK TRIBUTARY AT BEE STREET, SAN ANTONIO, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
APR 19...	2155	2	0	0	13	2	60

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
APR 19...	3	0	.0	0	0	10

DATE	TIME	TOTAL PCB (UG/L)	POLY-CHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
APR 19...	2155	.0	.00	.00	.1	.00	.03	.08	.05	.01	.00	.00

DATE	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRIETHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
APR 19...	.00	.01	.00	.00	.00	.00	.00	0	.00	.00	.04	.00

## GUADALUPE RIVER BASIN

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX

LOCATION.--Lat 29°21'25", Long 98°24'45", Bexar County, Hydrologic Unit 12100301, on right bank at upstream side of bridge on Loop 13 at San Antonio, 1.4 mi (2.3 km) east of Brooks Air Force Base, and 3.3 mi (5.3 km) upstream from Rosillo Creek.

DRAINAGE AREA.--189 mi<sup>2</sup> (490 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 526.95 ft (160.614 m) above mean sea level.

REMARKS.--Water-discharge records good. Small diversions above station. Most of low flow comes from artesian wells and springs in city of San Antonio. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see station 08178700.

AVERAGE DISCHARGE.--17 years, 40.7 ft<sup>3</sup>/s (1.153 m<sup>3</sup>/s), 2.92 in/yr (74 mm/yr), 29,490 acre-ft/yr (36.4 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,100 ft<sup>3</sup>/s (371 m<sup>3</sup>/s) Sept. 27, 1973, gage height, 28.83 ft (8.787 m); no flow Aug. 13, 1967.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1941, that of Sept. 27, 1973. Floods of Sept. 27, 1946, and Aug. 15, 1960, were about equal magnitude. Flood of Aug. 15, 1960, reached a stage of 26.8 ft (8.17 m), from floodmarks.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft<sup>3</sup>/s (17.0 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 29	1800	1,460	41.3	14.49	4.417	Apr. 20	1900	*3,560	101	19.02	5.797
Apr. 16	2100	1,060	30.0	13.31	4.057						

Minimum discharge, 15 ft<sup>3</sup>/s (0.42 m<sup>3</sup>/s) Aug. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	68	46	46	77	46	40	69	40	33	19	19
2	26	58	48	55	66	47	41	59	41	34	18	19
3	26	56	48	56	77	48	39	58	39	33	19	18
4	33	55	48	50	66	65	49	57	39	32	20	20
5	279	52	102	48	57	49	41	57	38	30	21	21
6	62	48	255	48	55	46	34	58	38	28	19	23
7	34	46	84	48	54	45	35	57	35	28	19	27
8	30	51	59	46	59	44	33	55	34	29	19	22
9	30	49	54	48	60	44	33	97	34	29	18	20
10	28	47	52	47	64	44	33	61	33	28	17	22
11	27	47	56	45	154	44	32	79	34	27	20	21
12	25	46	86	59	126	43	31	66	34	26	19	23
13	26	73	89	127	64	42	34	55	31	26	18	174
14	26	58	83	109	57	42	109	53	32	29	20	49
15	82	50	64	62	54	43	92	51	30	25	20	28
16	346	48	56	52	52	41	672	50	33	24	18	23
17	65	110	53	50	52	40	233	48	32	25	18	22
18	40	72	52	48	51	40	63	49	30	27	20	23
19	195	218	55	47	50	40	96	48	29	27	23	23
20	200	114	61	48	49	38	2580	47	29	25	21	20
21	51	63	54	47	49	38	687	173	29	23	23	21
22	40	54	51	84	51	37	111	92	38	22	20	22
23	38	50	50	354	50	37	80	52	78	22	18	22
24	134	50	50	100	48	38	71	48	102	23	18	23
25	112	57	64	65	47	39	66	47	44	23	18	22
26	52	80	53	58	47	40	62	45	37	21	17	20
27	44	61	50	55	46	49	60	43	35	22	18	19
28	72	53	48	53	46	50	59	43	33	21	21	19
29	1040	52	47	51	---	43	57	43	34	20	21	19
30	384	48	47	114	---	40	71	42	36	20	18	19
31	102	---	46	199	---	38	---	40	---	18	19	---
TOTAL	3676	1934	2011	2319	1728	1340	5644	1842	1151	800	597	823
MEAN	119	64.5	64.9	74.8	61.7	43.2	188	59.4	38.4	25.8	19.3	27.4
MAX	1040	218	255	354	154	65	2580	173	102	34	23	174
MIN	25	46	46	45	46	37	31	40	29	18	17	18
CFSM	.63	.34	.34	.40	.33	.23	1.00	.31	.20	.14	.10	.15
IN.	.72	.38	.40	.46	.34	.26	1.11	.36	.23	.16	.12	.16
AC-FT	7290	3840	3990	4600	3430	2660	11190	3650	2280	1590	1180	1630
(††)	9.43	2.32	2.04	3.34	.98	1.13	6.62	2.10	2.18	.14	.51	2.25
CAL YR 1976 TOTAL	22758		MEAN 62.2	MAX 1590	MIN 18	CFSM .33	IN 4.48	AC-FT 45140	†† 45.10			
WTR YR 1977 TOTAL	23865		MEAN 65.4	MAX 2580	MIN 17	CFSM .35	IN 4.70	AC-FT 47340	†† 33.04			

†† Weighted-mean rainfall, in inches, based on seven rain gages.

## GUADALUPE RIVER BASIN

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08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1968 to current year. Sediment analyses: October 1972 to September 1973.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS-CHARGE (CFS)	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DIS-SOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIO-CHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL.-7UM-MF (COL./100 ML)
APR 21...	1610	240	394	7.2	22.0	60	150	7.2	85	3.7	650000	470000
JUN 22...	1000	35	897	7.7	24.5	0	20	6.5	79	.7	4200	340
DATE	FECAL STREP-TOCOCCI KF AGAR (COL. PER 100 ML)	HARD-NESS (CA+MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
APR 21...	660000	170	35	57	5.5	18	.6	5.7	158	0	38	23
JUN 22...	1000	340	82	110	17	63	1.5	9.1	320	0	77	92
DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILT-RABLE RESIDUE (MG/L)	VOL. NON-FILT-RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)
APR 21...	.2	15	241	294	7.6	.49	.02	.07	1.1	.33	9.2	.00
JUN 22...	.4	15	541	37	10	2.0	.01	.09	.53	.05	2.8	.00



## GUADALUPE RIVER BASIN

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

				DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CAD- MIUM (CD) (UG/L)	DIS-SOLVED CHRO- MIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)			
		DATE	TIME									
		APR 21...	1610		3	100	0	11	2	90		
		JUN 22...	1000		1	200	0	10	1	10		
		DATE		DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN- GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELE- NIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)			
		APR 21...		0	10	.0	0	0	10			
		JUN 22...		0	4	.0	1	0	2			
DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
APR 21...	1610	.0	.00	.00	.0	.00	.00	.00	.17	.01	.00	.00
JUN 22...	1000	.0	.00	.00	.0	.00	.00	.01	.23	.01	.00	.00
DATE	TIME	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
APR 21...	.00	.00	.00	.00	.00	.00	.00	0	.00	.02	.35	.02
JUN 22...	.00	.00	.00	.00	.00	.00	.00	0	.00	.01	.02	.01

## 08179000 MEDINA RIVER NEAR PIPE CREEK, TX

LOCATION.--Lat 29°40'31", long 98°58'33", Bandera County, Hydrologic Unit 12100302, on right bank 500 ft (150 m) upstream from Bandera Falls, 0.6 mi (1.0 km) upstream from Red Bluff Creek, and 4.1 mi (6.6 km) southwest of Pipe Creek.

DRAINAGE AREA.--474 mi<sup>2</sup> (1,228 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1922 to June 1935, October 1952 to current year. Monthly discharge only for some periods, published in WSP 1312 and 1732.

REVISED RECORDS.--WSP 1312: 1925(M). WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,067.37 ft (325.334 m) above mean sea level, unadjusted. December 1922 to June 1935, water-stage recorder at site 1.9 mi (3.1 km) upstream at different datum.

REMARKS.--Water-discharge records good. Small diversion above station.

AVERAGE DISCHARGE.--37 years (water years 1923-34, 1953-77), 133 ft<sup>3</sup>/s (3.767 m<sup>3</sup>/s), 3.81 in/yr (97 mm/yr), 96,360 acre-ft/yr (119 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 72,900 ft<sup>3</sup>/s (2,060 m<sup>3</sup>/s) July 15, 1973, gage height, 37.3 ft (11.37 m), from flood-mark, from rating curve extended above 32,000 ft<sup>3</sup>/s (906 m<sup>3</sup>/s) on basis of slope-area measurement of 64,000 ft<sup>3</sup>/s (1,810 m<sup>3</sup>/s); minimum, 0.2 ft<sup>3</sup>/s (0.006 m<sup>3</sup>/s) July 14-16, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1880, about 43 ft (13.1 m) in 1919, present site and datum, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,100 ft<sup>3</sup>/s (116 m<sup>3</sup>/s) May 11, gage height, 10.57 ft (3.222 m); minimum, 39 ft<sup>3</sup>/s (1.10 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	132	395	211	249	283	272	175	463	478	222	96	51
2	126	368	206	254	284	272	178	448	455	211	92	51
3	121	347	204	255	296	278	173	433	368	202	90	50
4	124	333	206	251	284	275	168	424	339	195	88	49
5	225	316	218	245	278	265	160	399	323	189	87	49
6	139	304	259	247	276	257	156	386	306	184	83	49
7	127	295	236	243	275	252	153	372	305	179	82	51
8	127	285	228	239	304	246	150	361	293	173	80	65
9	124	276	228	238	304	244	148	348	282	168	77	58
10	123	268	226	232	307	244	142	573	271	161	76	56
11	120	263	257	229	331	244	140	2450	259	156	74	54
12	117	254	257	239	328	234	137	1080	251	152	74	53
13	115	252	257	304	317	231	139	743	302	147	74	54
14	113	256	293	293	317	226	150	645	260	143	74	52
15	281	255	283	276	315	218	560	597	241	137	71	50
16	232	254	283	266	312	211	998	604	232	134	68	49
17	155	254	283	259	312	211	681	610	226	132	67	48
18	145	244	285	257	312	207	514	584	215	131	66	46
19	158	257	296	253	309	200	453	555	207	131	67	45
20	170	244	285	253	304	196	960	536	199	128	64	45
21	156	234	279	253	304	193	825	678	194	126	63	45
22	152	224	281	264	304	189	737	556	192	120	61	45
23	149	218	279	291	307	186	649	500	346	117	60	44
24	246	221	275	284	293	185	603	465	495	114	59	44
25	185	228	281	276	288	186	568	442	348	111	57	44
26	165	239	269	275	285	187	541	423	295	106	55	43
27	157	224	269	275	278	253	521	407	266	104	52	42
28	180	214	268	271	275	231	502	396	247	102	53	40
29	465	211	261	263	---	208	488	392	238	99	54	40
30	523	211	261	282	---	192	479	378	228	100	55	39
31	441	---	252	301	---	179	---	365	---	98	52	---
TOTAL	5793	7944	7976	8117	8382	6972	12248	17613	8661	4472	2171	1451
MEAN	187	265	257	262	299	225	408	568	289	144	70.0	48.4
MAX	523	395	296	304	331	278	998	2450	495	222	96	65
MIN	113	211	204	229	275	179	137	348	192	98	52	39
CFSM	.40	.56	.54	.55	.63	.48	.86	1.20	.61	.30	.15	.10
IN.	.45	.62	.63	.64	.66	.55	.96	1.38	.68	.35	.17	.11
AC-FT	11490	15760	15820	16100	16630	13830	24290	34940	17180	8870	4310	2880
CAL YR 1976	TOTAL	65749	MEAN 180	MAX	903	MIN 34	CFSM .38	IN 5.16	AC-FT	130400		
WTR YR 1977	TOTAL	91800	MEAN 252	MAX	2450	MIN 39	CFSM .53	IN 7.20	AC-FT	182100		

## GUADALUPE RIVER BASIN

08179000 MEDINA RIVER NEAR PIPE CREEK, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1974 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM .7UM-MF (COL./ 100 ML)
DATE	TIME											
NOV 15...	1130	252	607	7.6	12.0	0	1	10.0	96	.7	82	22
JAN 24...	1130	283	596	7.8	13.0	0	3	9.9	97	.6	82	32
MAR 21...	1045	194	594	7.8	18.0	0	3	9.1	99	.6	150	38
MAY 23...	1100	502	543	7.7	23.5	0	3	8.1	98	.4	3000	1200
JUL 25...	1050	109	553	7.6	26.0	0	1	7.6	95	.2	500	55
SEP 19...	1115	45	564	7.9	26.0	0	3	7.6	95	.5	150	54
	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
DATE												
NOV 15...	60	310	71	90	20	11	.3	1.5	288	0	53	16
JAN 24...	76	300	70	90	19	9.7	.2	1.4	284	0	62	17
MAR 21...	210	290	71	82	20	11	.3	1.5	264	0	63	18
MAY 23...	620	280	61	85	17	8.3	.2	1.4	270	0	47	15
JUL 25...	640	270	72	78	18	10	.3	1.4	240	0	66	17
SEP 19...	350	280	92	76	22	11	.3	1.6	230	0	77	20
	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SIO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	
DATE												
NOV 15...	.3	14	348	3	0	1.1	.00	.01	.11	.00	1.4	
JAN 24...	.2	11	350	8	1	.31	.00	.00	.15	.00	1.8	
MAR 21...	.2	12	338	8	1	1.1	.00	.02	.34	.01	3.2	
MAY 23...	.2	11	318	6	1	.85	.01	.01	.09	.01	2.3	
JUL 25...	.3	13	322	4	0	.64	.01	.01	.19	.01	1.1	
SEP 19...	.3	13	334	6	0	.58	.01	.01	.15	.02	1.1	

GUADALUPE RIVER BASIN

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08179000 MEDINA RIVER NEAR PIPE CREEK, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

				DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)			
		DATE	TIME									
		JAN 24...	1130		1	0	0	0	0	0		
		SEP 19...	1115		0	100	1	0	0	10		
		DATE		DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)			
		JAN 24...		0	10	.2	2	0	0			
		SEP 19...		0	1	.0	0	0	0			
DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLORINATED NAPHTHA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
MAR 21...	1045	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
SEP 19...	1115	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
DATE	TIME	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
MAR 21...	.00	.00	.00	.00	.00	.00	.00	0	.00	.03	.00	.00
SEP 19...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

LOCATION.--Lat 29°40'51", long 98°57'19", Bandera County, Hydrologic Unit 12100302, on left bank 0.8 mi (1.3 km) upstream from bridge on Farm Road 1283, 1.8 mi (2.9 km) downstream from Pipe Creek, 1.9 mi (3.1 km) upstream from mouth, and 3.2 mi (5.1 km) south of Pipe Creek.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 562 ft<sup>3</sup>/s (15.9 m<sup>3</sup>/s) Oct. 15, gage height, 4.94 ft (1.506 m), no other peak above base of 200 ft<sup>3</sup>/s (5.66 m<sup>3</sup>/s); no flow for many days.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.00	107	31	39	29	20	2.9	31	9.9	7.6	.00	.00		
2	.00	91	31	39	30	20	2.9	29	14	5.6	.00	.00		
3	.00	80	30	37	31	23	1.9	27	8.8	4.1	.00	.00		
4	.00	73	30	35	29	21	.96	25	6.9	2.6	.00	.00		
5	.00	67	33	33	29	18	.78	23	5.9	1.6	.00	.00		
6	.00	61	38	34	29	16	.58	22	5.2	.92	.00	.00		
7	.00	55	34	31	29	16	.33	18	5.3	.32	.00	.00		
8	.00	52	34	29	32	15	.23	18	3.8	.01	.00	.00		
9	.00	49	34	29	30	14	.15	20	2.8	.00	.00	.00		
10	.00	46	35	27	31	14	.06	18	1.6	.00	.00	.00		
11	.00	43	57	25	33	13	.01	33	.94	.00	.00	.00		
12	.00	42	55	27	32	12	.00	22	.58	.00	.00	.00		
13	.00	45	60	31	31	11	.04	19	3.6	.00	.00	.00		
14	.00	41	95	30	31	10	.99	18	.42	.00	.00	.00		
15	107	39	98	28	31	9.5	15	17	.08	.00	.00	.00		
16	67	37	94	27	31	8.5	56	17	.12	.00	.00	.00		
17	44	37	90	27	31	8.5	63	16	.00	.00	.00	.00		
18	38	35	86	26	30	7.9	50	15	.00	.00	.00	.00		
19	40	39	83	26	29	6.4	49	14	.00	.00	.00	.00		
20	38	35	75	26	28	5.9	71	13	.00	.00	.00	.00		
21	34	33	73	25	28	5.8	67	25	.00	.00	.00	.00		
22	33	32	70	29	28	5.4	64	17	.00	.00	.00	.00		
23	33	32	65	30	27	5.1	59	16	32	.00	.00	.00		
24	37	32	61	28	25	5.3	52	14	31	.00	.00	.00		
25	34	35	59	27	24	5.1	47	14	21	.00	.00	.00		
26	33	35	54	27	23	5.7	43	13	17	.00	.00	.00		
27	34	32	52	27	22	12	40	12	15	.00	.00	.00		
28	40	32	49	27	22	9.6	37	12	13	.00	.00	.00		
29	142	32	47	26	---	5.7	34	12	12	.00	.00	.00		
30	156	31	44	31	---	4.1	33	11	9.2	.00	.00	.00		
31	126	---	41	32	---	2.5	---	9.5	---	.00	.00	---		
TOTAL	1036.00	1400	1738	915	805	336.0	791.83	570.5	220.14	22.75	.00	.00		
MEAN	33.4	46.7	56.1	29.5	28.8	10.8	26.4	18.4	7.34	.73	.000	.000		
MAX	156	107	98	39	33	23	71	33	32	7.6	.00	.00		
MIN	.00	31	30	25	22	2.5	.00	9.5	.00	.00	.00	.00		
CFSM	.59	.83	1.00	.52	.51	.19	.47	.33	.13	.01	.000	.000		
IN.	.68	.93	1.15	.60	.53	.22	.52	.38	.15	.02	.00	.00		
AC-FT	2050	2780	3450	1810	1600	666	1570	1130	437	45	.00	.00		
CAL YR 1976	TOTAL	8851.62	MEAN	24.2	MAX	867	MIN	.00	CFSM	.43	IN	5.85	AC-FT	17560
WTR YR 1977	TOTAL	7835.22	MEAN	21.5	MAX	156	MIN	.00	CFSM	.38	IN	5.18	AC-FT	15540

## GUADALUPE RIVER BASIN

321

08179500 MEDINA LAKE NEAR SAN ANTONIO, TX

LOCATION.--Lat 29°32'24", Long 98°56'01", Medina County, Hydrologic Unit 12100302, at gate operating platform, 576 ft (176 m) from left end of Medina Dam on Medina River, 4.2 mi (6.8 km) upstream from Medina diversion dam, 13 mi (21 km) north of Castrovilla, 28 mi (45 km) west of San Antonio, and 70.4 mi (113.3 km) upstream from mouth. Water-quality sampling site at the center of low-water bridge 0.6 mi (1.0 km) downstream.

DRAINAGE AREA.--634 mi<sup>2</sup> (1,642 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1913 to current year. Prior to October 1965 (revised), monthend contents only.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Nonrecording gage read once daily if stage changing materially, otherwise intermittently. Datum of gage is 7.80 ft (2.377 m) below mean sea level.

REMARKS.--The lake is formed by a gravity-type concrete dam 1,580 ft (482 m) long. The dam was completed and storage began May 7, 1913. The uncontrolled spillway section is a cut through natural rock 880 ft (268 m) long, with a 3-foot-wide (1 m) cutoff wall, located near right end of dam. The dam and lake are owned by the Bexar-Medina-Atascosa Counties Water Improvement District No. 1, which has a permit from the Texas Water Rights Commission to irrigate 150,000 acres (60,700 km<sup>2</sup>) annually. An undetermined amount of water from the lake enters the Edwards and associated limestones in the Balcones Fault Zone, part of which is above and part below the dam. Water is released downstream to Medina Diversion Reservoir where it is diverted into Medina Canal by the Water District. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam.....	1,084.0	0
Crest of spillway.....	1,072.0	254,000
Water-supply outlet pipes (invert).....	966.5	4,780
Lowest gated outlet (invert).....	920.0	0

COOPERATION.--Capacity table, based on survey made prior to June 1912, and gage-height record furnished by Bexar-Medina-Atascosa Counties Water Improvement District No. 1.

EXTREMES (at 0800) FOR PERIOD OF RECORD.--Maximum contents observed, 288,800 acre-ft (356 hm<sup>3</sup>) Sept. 16, 1919, gage height, 1,078.0 ft (328.57 m); minimum observed since lake first filled, 780 acre-ft (0.962 hm<sup>3</sup>) about Apr. 11, 1948, gage height, 944.0 ft (287.73 m).

EXTREMES (at 0800) FOR CURRENT YEAR.--Maximum contents, 260,400 acre-ft (321 hm<sup>3</sup>) May 12, gage height, 1,073.1 ft (327.08 m); minimum, 236,900 acre-ft (292 hm<sup>3</sup>) Sept. 30, gage height, 1,068.9 ft (325.80 m).

Capacity table (gage height, in feet, and total contents, in acre-feet)

1,060.0	192,000
1,070.0	242,400
1,080.0	300,300

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 0900

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	255200	258100	255700	256300	256300	255700	255200	256900	256300	255200	252900	240000
2	255200	257500	255700	255700	256300	255700	255200	256900	256900	255200	252900	243000
3	255200	257500	255200	255700	256300	255700	255200	256300	256900	255200	252300	243000
4	254600	257500	255700	255700	256300	256300	255200	256300	256300	255200	252300	241900
5	255700	257500	255700	255700	256300	256300	255200	256300	256300	255200	251700	241400
6	255700	257500	256300	255700	256300	256300	255200	256300	256300	255200	251700	241400
7	255200	256900	255700	255700	256300	255700	255700	255700	256300	255200	251100	241400
8	255200	256900	255700	255700	256300	255700	255700	255700	256300	254600	250500	241400
9	254600	256900	255700	255700	256300	255700	255700	256300	255700	255200	250500	240900
10	254600	256300	255700	255700	256300	255700	255700	256300	255700	254600	250000	240900
11	255200	256300	256300	256300	256300	255700	255700	258100	255700	254600	249400	240900
12	254600	256300	256300	256300	256300	255700	255700	260400	255700	254600	249400	240400
13	254600	256900	256900	256300	256300	255700	254000	259200	255700	254000	248800	240400
14	254600	256900	257500	256300	256300	255700	254600	258100	255700	254000	248200	240400
15	254000	256300	257500	256300	256300	255700	255700	257500	255700	254000	248200	240400
16	258100	256300	257500	256300	256300	255200	256300	257500	255200	254000	247600	240400
17	257500	256300	256900	256300	256300	255200	257500	257500	255200	254000	247600	239900
18	256300	256300	256900	255700	256300	255200	257500	256900	255200	254000	247100	239400
19	256300	256300	256900	255700	256300	255200	256900	256900	255200	254000	247100	238900
20	256300	256300	256900	255700	256300	255200	257500	256900	255200	254000	247100	238900
21	256300	255700	256900	255700	256300	255200	257500	256900	255200	254000	247100	238900
22	255700	255700	256900	255700	256300	255200	257500	256900	255200	254000	247100	238400
23	255700	255700	256900	255700	256300	255200	257500	256900	255200	254000	245900	238400
24	255700	255700	256900	256300	256300	255200	257500	256900	256300	254000	245300	237900
25	255700	256300	256300	256300	256300	255200	257500	256900	256300	253400	244700	237900
26	256300	256300	256300	256300	256300	255200	257500	256900	256300	253400	244700	237900
27	256900	256300	256300	256300	256300	255200	256900	256900	256300	253400	244200	237400
28	257500	255700	256300	256300	256300	255700	256900	256900	255700	253400	244200	237400
29	258100	255700	256300	256300	---	255200	256900	256300	255700	252900	243600	237400
30	258600	255700	256300	256300	---	255200	256900	256300	255700	252900	243000	236900
31	258600	---	256300	256300	---	255200	---	256300	---	252900	243000	---
(†)	1069.7	1068.8	1067.9	1067.0	1065.7	1064.3	1068.3	1071.7	1072.2	1072.3	1072.2	1072.2
(*)	-6200	-4500	-4600	-4500	-6600	-7000	+20200	+18400	+2900	+500	-500	0
MAX	247100	240400	235900	231800	226800	220200	233900	252300	255200	258100	255700	256300
MIN	240900	236400	231800	227300	220700	213700	213200	233900	251700	254600	253400	254000
CAL YR 1976	MAX	263900	MIN	231800	*	-23900						
WTR YR 1977	MAX	258100	MIN	213200	*	+8100						

† Gage height, in feet, at end of month.

\* Change in contents, in acre-feet.



## GUADALUPE RIVER BASIN

08179500 MEDINA LAKE NEAR SAN ANTONIO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DIS-SOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIO-CHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS (MG/L)
DEC 21...	1355	423	8.2	12.0	4	2	10.2	98	.6	25	200	41
FEB 03...	1415	441	8.2	--	--	--	--	--	--	--	220	54
JUL 19...	1555	418	8.0	--	--	--	--	--	--	--	190	46

DATE	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)
DEC 21...	55	16	8.9	.3	1.9	198	0	47	15	.2	11
FEB 03...	60	17	8.8	.3	1.8	202	0	46	14	.4	11
JUL 19...	53	15	8.9	.3	1.6	180	0	49	17	.2	11

DATE	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL NITRATE PLUS NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)
DEC 21...	253	.21	.00	.21	.08	.16	.01	2.8	.00	0	5
FEB 03...	259	--	--	--	--	--	--	--	--	--	--
JUL 19...	244	--	--	--	--	--	--	--	--	--	--

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
DEC 21...	1355	2	0	0	3	0	0

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED NICKEL (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
DEC 21...	2	5	.0	1	0	10

## GUADALUPE RIVER BASIN

323

08180000 MEDINA CANAL NEAR RIOMEDINA, TX

LOCATION.--Lat 29°30'19", long 98°54'11", Medina County, Hydrologic Unit 12100302, in center of canal, 54 ft (16 m) upstream from center pier of double-barrel flume, 350 ft (107 m) downstream from county highway bridge, 1,900 ft (579 m) downstream from head of canal and diversion dam, 4.6 mi (7.4 km) downstream from Medina Dam, 4.7 mi (7.6 km) north of Riomedina, and 25 mi (40 km) northwest of San Antonio.

PERIOD OF RECORD.--March 1922 to May 1934, July 1957 to current year.

REVISED RECORDS.--WSP 568: 1922. WSP 1712: 1922(M), 1924, 1926.

GAGE.--Water-stage recorder. Altitude of gage is 910 ft (277 m), from topographic map.

REMARKS.--Records good. Station is above all diversions from canal. Canal diverts from right end of Medina Diversion Dam 1,900 ft (579 m) upstream from gage for irrigation downstream near Lacoste and Natalia. Several observations of water temperatures were made during the year.

AVERAGE DISCHARGE.--31 years (water years 1923-33, 1958-77), 39.7 ft<sup>3</sup>/s (1.124 m<sup>3</sup>/s), 28,760 acre-ft/yr (35.5 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 216 ft<sup>3</sup>/s (6.12 m<sup>3</sup>/s) May 6, 1971; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.05	.10	.05	.04	48	37	22	72	44	91	73
2	.00	.04	.05	.03	.08	36	28	13	80	43	99	85
3	.00	.06	.00	.02	.04	28	28	.20	93	42	109	71
4	9.4	.07	.02	.04	.01	29	27	.17	96	42	115	67
5	11	.08	.07	.04	.01	28	27	.14	96	51	122	67
6	.10	.05	.02	.02	.01	28	27	.14	100	63	122	62
7	.07	.05	.04	.01	.01	28	29	.12	118	63	125	62
8	.06	.03	.07	.01	.01	42	34	.10	126	71	131	58
9	.05	.02	.06	.05	.01	52	34	.11	129	75	135	52
10	.03	16	.04	.04	.01	52	34	20	128	75	134	44
11	.03	28	.09	.06	.01	51	35	15	123	75	125	34
12	.03	9.7	.11	.09	.01	51	37	.31	122	80	119	42
13	18	.07	.13	.06	.01	20	48	.28	123	88	124	16
14	28	.05	.06	.02	.00	16	46	.28	127	104	127	.10
15	16	.04	.05	.04	.01	61	27	.28	129	122	127	.04
16	.14	.05	.05	.10	.01	44	8.5	.28	127	119	125	.02
17	.11	.05	.04	.14	.01	36	.05	.25	128	116	123	.07
18	.10	.07	.03	.21	.01	41	.04	24	132	88	117	.08
19	.18	.05	.02	.29	.01	40	.06	36	133	48	102	12
20	.07	.04	.01	.29	.01	38	.06	8.8	132	55	92	34
21	.05	.08	.01	.28	30	42	.08	.02	133	64	97	36
22	.04	.12	.01	.16	45	47	.07	.02	115	71	106	34
23	.05	.14	.02	.02	39	47	.04	24	37	70	105	28
24	.23	.17	.04	.04	29	47	.02	35	.07	69	102	28
25	.04	.13	.04	.04	9.6	49	.03	35	.07	85	114	28
26	.04	.03	.04	.04	.14	49	.02	35	.06	103	128	30
27	.11	.05	.04	.03	6.4	36	.03	35	6.6	98	121	30
28	.16	.10	.03	.05	36	28	.02	42	34	98	112	28
29	.21	.13	.02	.10	---	28	9.4	45	46	96	101	43
30	.04	.10	.02	.12	---	31	22	54	52	92	81	46
31	.07	---	.04	.04	---	40	---	63	---	88	62	---
TOTAL	84.41	55.62	1.37	2.53	195.46	1213	538.42	509.50	2737.80	2398	3493	1110.31
MEAN	2.72	1.85	.044	.082	6.98	39.1	17.9	16.4	91.3	77.4	113	37.0
MAX	28	28	.13	.29	45	61	48	63	133	122	135	85
MIN	.00	.02	.00	.01	.00	16	.02	.02	.06	42	62	.02
AC-FT	167	110	2.7	5.0	388	2410	1070	1010	5430	4760	6930	2200
CAL YR 1976	TOTAL	11962.48	MEAN	32.7	MAX	161	MIN	.00	AC-FT	23730		
WTR YR 1977	TOTAL	12339.42	MEAN	33.8	MAX	135	MIN	.00	AC-FT	24480		

## GUADALUPE RIVER BASIN

08180800 MEDINA RIVER NEAR SOMERSET, TX

LOCATION.--Lat 29°15'45", long 98°34'56", Bexar County, Hydrologic Unit 12100302, on left bank 300 ft (91 m) upstream from bridge on State Highway 16, 2.1 mi (3.4 km) upstream from Elm Creek, 4.9 mi (7.9 km) downstream from Medio Creek, 5.2 mi (8.4 km) northeast of Somerset, and 14.1 mi (22.7 km) upstream from mouth.

DRAINAGE AREA.--967 mi<sup>2</sup> (2,505 km<sup>2</sup>), 634 mi<sup>2</sup> (1,642 km<sup>2</sup>) above dam forming Medina Lake.

PERIOD OF RECORD.--October 1970 to current year.

GAGE.--Water-stage recorder. Datum of gage is 493.56 ft (150.437 m) above mean sea level.

REMARKS.--Records good. Flow is regulated by Medina Lake (station 08179500) 56 mi (90 km) upstream and by Medina Diversion Lake, capacity 4,500 acre-ft (5.55 hm<sup>3</sup>). For diversion of canal records, see Medina Canal near Riomedina (station 08180000). A large part of the streamflow is lost into the Edwards and associated limestones in the Balcones Fault Zone which crosses the basin between the upstream end of Medina lake and about 5 mi (8 km) downstream from Medina Dam or 0.9 mi (1.4 km) downstream from the diversion dam. There are several small diversions below Medina Diversion Dam. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--7 years, 293 ft<sup>3</sup>/s (8.298 m<sup>3</sup>/s), 212,300 acre-ft/yr (262 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,500 ft<sup>3</sup>/s (864 m<sup>3</sup>/s) July 17, 1973, gage height, 29.39 ft (8.958 m); minimum, 21 ft<sup>3</sup>/s (0.59 m<sup>3</sup>/s) July 23, 24, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1890, that of July 17, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,430 ft<sup>3</sup>/s (68.8 m<sup>3</sup>/s) Apr. 20, gage height, 15.63 ft (4.764 m); minimum, 84 ft<sup>3</sup>/s (2.38 m<sup>3</sup>/s) Aug. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	279	1170	423	513	551	417	293	676	509	321	105	92
2	256	1100	414	489	524	398	275	675	508	302	103	92
3	238	1010	412	490	522	389	270	642	562	292	105	92
4	226	935	405	489	531	419	272	618	548	274	102	93
5	495	867	411	480	519	430	274	587	494	260	99	94
6	367	800	439	477	507	414	256	564	447	246	98	99
7	316	745	486	477	497	397	238	551	413	232	102	104
8	282	709	475	465	491	383	228	537	388	220	99	111
9	263	676	457	455	510	371	218	530	366	209	96	113
10	236	644	447	458	517	351	211	510	339	201	93	108
11	217	619	448	433	529	349	206	495	321	187	92	107
12	204	579	540	422	538	347	204	500	312	176	91	110
13	193	583	570	452	542	336	202	710	304	167	95	1320
14	183	577	608	495	531	329	203	1000	300	157	93	428
15	181	550	666	489	519	345	207	920	311	149	92	152
16	214	525	669	478	518	321	340	850	298	144	89	119
17	524	528	668	476	510	311	468	780	279	134	87	114
18	571	528	668	459	506	312	596	730	255	132	87	113
19	522	585	671	458	503	310	639	700	239	126	87	115
20	558	632	677	440	501	306	1540	680	220	125	88	116
21	498	564	674	436	493	298	1330	694	207	125	87	107
22	455	532	635	442	481	279	987	738	194	123	87	101
23	419	499	613	572	459	269	983	786	218	121	88	99
24	406	474	604	578	461	259	931	751	327	121	88	95
25	626	470	602	540	455	255	866	700	429	121	86	94
26	592	578	604	511	450	259	810	646	461	116	86	95
27	548	539	583	493	466	266	762	614	443	115	89	96
28	523	504	561	486	446	290	725	586	418	113	99	93
29	1030	477	550	478	---	318	687	565	381	111	95	94
30	1560	440	535	478	---	311	670	551	353	111	93	95
31	1220	---	518	563	---	308	---	527	---	108	92	---
TOTAL	14202	19439	17033	14972	14077	10347	15891	20413	10844	5339	2893	4661
MEAN	458	648	549	483	503	334	530	658	361	172	93.3	155
MAX	1560	1170	677	578	551	430	1540	1000	562	321	105	1320
MIN	181	440	405	422	446	255	202	495	194	108	86	92
AC-FT	28170	38560	33780	29700	27920	20520	31520	40490	21510	10590	5740	9250
CAL YR 1976	TOTAL	103614	MEAN 283	MAX 3620	MIN 57	AC-FT 205500						
WTR YR 1977	TOTAL	150111	MEAN 411	MAX 1560	MIN 86	AC-FT 297700						

08181000 LEON CREEK TRIBUTARY AT FARM ROAD 1604, SAN ANTONIO, TX  
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°35'14", long 98°37'40", Bexar County, Hydrologic Unit 12100301, 97 ft (30 m) upstream from culvert on Farm Road 1604 at San Antonio and 1.5 mi (2.4 km) west of bridge on Leon Creek.

DRAINAGE AREA.--5.57 mi<sup>2</sup> (14.43 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1968 to current year.

GAGE.--Digital recorders (water stage and rainfall). Gage not referenced to mean sea level.

REMARKS.--Additional storm rainfall-runoff data for this site can be obtained from the report "Hydrologic Data for Urban Studies in the San Antonio, Texas Metropolitan Area, 1977."

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,790 ft<sup>3</sup>/s (50.7 m<sup>3</sup>/s) July 16, 1973, gage height, 10.91 ft (3.325 m).

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 200 ft<sup>3</sup>/s (5.66 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 19	unknown	a10	0.28	unknown	--	Sept. 6	0305	a95	2.69	3.06	0.933
Oct. 24	0455	*280	7.93	3.90	1.189						

a Water-quality samples obtained on this flood event.

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: May 1970 to current year. Sediment analyses: May 1972 to June 1973. Water temperatures: May 1970 to current year. Bacteria analyses: April 1976 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	CHEMICAL OXYGEN DEMAND (LOW LEVEL) (MG/L)	
OCT 19...	1345	1.0	126	8.2	13.0	130	80	11.8	116	14	
SEP 06...	1120	.10	112	7.0	25.0	140	45	8.0	99	50	
DATE	TIME	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM PER 100 ML	FECAL COLIFORM (COL./100 ML)	FECAL STREPTOCOCCI KF AGAR (COL./100 ML)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO
OCT 19...	2.3	15000	4600	12000	50	0	19	.7	2.5	.2	
SEP 06...	7.8	190000	140000	13000	54	4	20	1.1	1.7	.1	
DATE	TIME	DISSOLVED PHOSPHORUS (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	
OCT 19...	1.7	62	0	7.1	1.5	.2	9.4	73	110		
SEP 06...	1.8	62	0	4.5	1.1	.0	4.4	65	58		
DATE	TIME	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	OIL AND GREASE (MG/L)	
OCT 19...	32	.24	.01	.02	.48	.05	7.8	.00	1		
SEP 06...	11	.60	.04	.03	.27	.03	9.0	.10	0		

## GUADALUPE RIVER BASIN

08181000 LEON CREEK TRIBUTARY AT FARM ROAD 1604, SAN ANTONIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

				DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)				
		DATE	TIME										
		OCT 19...	1345	--	100	0	0	2	10				
		SEP 06...	1120	1	0	0	0	2	30				
		DATE		DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)				
		OCT 19...		0	0	--	--	0	40				
		SEP 06...		2	10	.0	0	0	0				
DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	
OCT 19...	1345	.0	.00	.00	.0	.00	.00	.00	.07	.00	.00	.00	
SEP 06...	1120	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00	
DATE	TIME	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 19...		.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
SEP 06...		.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.01	.00

## 08181400 HELOTES CREEK AT HELOTES, TX

LOCATION.--Lat 29°34'42", long 98°41'29", Bexar County, Hydrologic Unit 12100302, 42 ft (13 m) left of and 44 ft (13 m) downstream from centerline of bridge on State Highway 16, 0.1 mi (0.2 km) northwest of Helotes, and 8.6 mi (13.8 km) upstream from mouth.

DRAINAGE AREA.--15.0 mi<sup>2</sup> (38.8 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1968 to current year.

REVISED RECORDS.--WDR TX-73-1: 1972(M).

GAGE.--Water-stage recorder. Datum of gage is 1,014.82 ft (309.317 m) above mean sea level.

REMARKS.--Water-discharge records good. An undetermined amount of flow is diverted for domestic use above the station, and some flow enters the Edwards and associated limestones through the Balcones Fault Zone in the vicinity of the gage. Recording rain gage located at station, with two additional recording rain gages located in watershed.

AVERAGE DISCHARGE.--9 years, 4.90 ft<sup>3</sup>/s (0.139 m<sup>3</sup>/s), 4.44 in/yr (113 mm/yr), 3,550 acre-ft/yr (4.38 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,680 ft<sup>3</sup>/s (217 m<sup>3</sup>/s) July 16, 1973, gage height, 10.8 ft (3.29 m), from floodmarks, from rating curve extended above 5,000 ft<sup>3</sup>/s (142 m<sup>3</sup>/s); no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1923, 13.7 ft (4.18 m) in 1927, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 140 ft<sup>3</sup>/s (3.96 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 15	1600	190	5.38	2.53	0.771	Oct. 29	0815	308	8.72	2.83	0.863
aOct. 19	1345	32	.91	1.96	.597	aApr. 20	0015	86	2.44	2.32	.707
Oct. 24	0345	*1,840	52.1	5.21	1.588						

a Water-quality samples obtained on this flood event.

Minimum discharge, no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	76	12	6.7	13	5.6	.37	7.8	5.8	.40	.00	.00
2	.00	52	12	7.1	12	5.3	.50	7.0	5.0	.20	.00	.00
3	.00	39	12	6.6	12	5.3	.31	6.3	4.4	.10	.00	.00
4	.70	31	11	6.4	10	5.0	1.3	5.7	3.7	.02	.00	.00
5	6.3	24	12	5.5	10	4.1	.39	5.3	3.3	.00	.00	.00
6	1.7	21	18	5.1	11	3.8	.12	5.1	2.8	.00	.00	.00
7	.00	17	16	4.6	11	3.6	.03	4.2	3.2	.00	.00	.00
8	.00	15	15	4.6	12	3.4	.00	3.7	2.5	.00	.00	.00
9	.00	12	15	4.5	11	3.2	.00	4.9	2.4	.00	.00	.00
10	.00	11	15	4.2	10	3.2	.00	3.8	2.3	.00	.00	.00
11	.00	9.8	16	4.2	11	3.1	.00	6.4	1.9	.00	.00	.00
12	.00	8.5	16	4.6	10	2.8	.00	4.5	2.1	.00	.00	.12
13	.00	10	17	7.1	10	2.3	.00	4.0	2.9	.00	.00	.00
14	.00	8.0	18	7.5	9.7	2.1	.00	3.3	2.5	.00	.00	.00
15	33	7.4	18	7.5	9.0	1.8	3.8	3.5	2.2	.00	.00	.00
16	42	7.1	18	7.1	8.5	1.7	24	3.5	2.0	.01	.00	.00
17	27	7.1	17	7.1	8.5	1.6	27	3.3	1.4	.00	.00	.00
18	17	6.8	17	7.4	8.5	1.4	18	3.2	.91	.00	.00	.00
19	21	9.7	17	6.6	8.4	.93	15	2.9	.76	.00	.00	.00
20	21	8.6	16	7.2	8.0	.75	44	2.8	.56	.00	.00	.00
21	16	7.3	14	7.5	7.7	.82	52	10	1.0	.00	.00	.00
22	13	6.9	13	10	7.5	1.1	39	6.5	2.0	.00	.00	.00
23	11	6.2	11	20	6.5	.97	31	5.2	3.7	.00	.00	.00
24	359	6.2	11	20	6.0	1.0	25	5.0	3.0	.00	.00	.00
25	170	13	11	18	5.9	1.1	20	4.9	1.9	.00	.00	.00
26	100	17	9.1	17	5.9	1.8	16	4.6	1.1	.00	.00	.00
27	56	15	9.1	16	5.8	2.5	13	4.6	.99	.00	.00	.00
28	48	13	8.5	15	5.8	1.7	12	4.7	.70	.00	.00	.00
29	220	13	8.0	14	---	1.0	10	4.6	.61	.00	.00	.00
30	202	13	7.8	16	---	.71	9.3	4.2	.49	.00	.00	.00
31	123	---	6.7	14	---	.36	---	4.2	---	.00	.00	---
TOTAL	1487.70	491.6	417.2	289.1	254.7	74.04	362.12	149.7	68.12	.73	.00	.12
MEAN	48.0	16.4	13.5	9.33	9.10	2.39	12.1	4.83	2.27	.024	.000	.004
MAX	359	76	18	20	13	5.6	52	10	5.8	.40	.00	.12
MIN	.00	6.2	6.7	4.2	5.8	.36	.00	2.8	.49	.00	.00	.00
CFSM	3.20	1.09	.90	.62	.61	.16	.81	.32	.15	.002	.000	.000
IN.	3.69	1.22	1.03	.72	.63	.18	.90	.37	.17	.00	.00	.00
AC-FT	2950	975	828	573	505	147	718	297	135	1.4	.00	.2
(††)	11.09	2.54	2.34	3.33	.97	1.79	6.13	2.48	3.70	.68	1.42	3.69
CAL YR 1976	TOTAL	3564.60	MEAN	9.74	MAX	359	MIN	.00	CFSM	.65	IN	8.84
WTR YR 1977	TOTAL	3595.13	MEAN	9.85	MAX	359	MIN	.00	CFSM	.66	IN	8.92
									AC-FT	7070	††	48.02
										7130	††	40.16

†† Weighted-mean rainfall, in inches, based on three rain gages.



## GUADALUPE RIVER BASIN

08181400 HELOTES CREEK AT HELOTES, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1968 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLT- FORM (7UM-MF (COL./ 100 ML)
OCT												
19...	1500	32	400	6.8	15.5	8	4	10.4	107	1.2	1600	640
24...	1200	234	346	7.8	18.5	50	25	7.9	87	.8	11000	6800
APR												
19...	2334	60	415	7.9	20.0	0	5	7.9	90	2.1	2200	1100
	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
OCT												
19...	1200	230	7	71	12	6.5	.2	1.1	268	0	11	9.6
24...	21000	180	7	59	8.3	4.5	.1	1.9	212	0	8.8	6.3
APR												
19...	3800	240	32	73	13	7.7	.2	.8	249	0	16	12
	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHY- LENE BLUE ACTIVE SUB- STANCE (MG/L)
OCT												
19...	.5	8.8	253	2		.74	.01	.00	.16	.01	1.6	.10
24...	.2	8.3	202	35	6	.53	.01	.01	.43	.03	9.0	.00
APR												
19...	.1	8.1	253	13	4	.57	.00	.01	.11	.01	9.1	.00

GUADALUPE RIVER BASIN

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08181400 HELOTES CREEK AT HELOTES, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
OCT 19...	1500	--	100	0	0	3	0
24...	1200	1	200	0	0	0	30
APR 19...	2334	0	0	0	11	0	10

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
OCT 19...	0	0	--	--	0	0
24...	0	0	.0	0	0	10
APR 19...	0	0	.0	0	0	0

DATE	TIME	TOTAL PCB (UG/L)	POLY-CHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLORDANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
OCT 19...	1500	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
24...	1200	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
APR 19...	2334	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL HEPTACHLOR (UG/L)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 19...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
24...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
APR 19...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

## GUADALUPE RIVER BASIN

08181410 RANCH CREEK NEAR HELOTES, TX

LOCATION.--Lat 29°36'06", long 98°43'26", Bexar County, Hydrologic Unit 12100302, on right bank 1.5 mi (2.4 km) upstream from Los Reyes Creek and 2.6 mi (4.2 km) northwest of Helotes.

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1976 to September 1977.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS-CHARGE (CFS)	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TURBIDITY (JTU)	DIS-SOLVED OXYGEN (MG/L)	PER-CENT SATURATION	CHEMICAL OXYGEN DEMAND (LOW LEVEL) (MG/L)
OCT 19...	1425	.01	342	7.4	14.5	32	3	10.7	108	18
APR 20...	1215	.30	393	7.7	25.5	25	3	8.4	105	25
DATE	BIO-CHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. / 100 ML)	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO
OCT 19...	1.1	1400	110	2000	180	3	56	9.0	5.6	.2
APR 20...	1.4	2100	64	1000	210	5	69	10	3.5	.1
DATE	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	
OCT 19...	.9	212	0	5.2	7.4	.1	7.3	196	3	
APR 20...	.8	254	0	4.0	4.0	.1	11	228	5	
DATE	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHYLENE BLUE ACTIVE SUBSTANCE (MG/L)	OIL AND GREASE (MG/L)	
OCT 19...	2	.08	.00	.02	56	.01	4.0	.00	3	
APR 20...	2	.06	.00	.00	.29	.01	7.2	.00	2	

GUADALUPE RIVER BASIN

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08181410 RANCH CREEK NEAR HELOTES, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)				
DATE	TIME											
OCT 19...	1425	--	100	0	0	1	10	0				
APR 20...	1215	0	100	0	15	0	10	0				
		DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED NICKEL (NI) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED VANA- DIUM (V) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)				
DATE												
OCT 19...		0	--	0	--	0	1.3	10				
APR 20...		0	.0	0	0	0	5.0	0				
DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	
OCT 19...	1425	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	
APR 20...	1215	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	
DATE	TIME	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 19...		.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00
APR 20...		.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00

## GUADALUPE RIVER BASIN

08181450 LEON CREEK TRIBUTARY AT KELLY AIR FORCE BASE, TX

LOCATION.--Lat 29°23'12", long 98°36'00", Bexar County, Hydrologic Unit 12100302, on left bank 128 ft (39 m) downstream from centerline of bridge on Billy Mitchell Road at Kelly Air Force Base, 0.15 mi (0.24 km) upstream from mouth, and 2.0 mi (3.2 km) southeast of intersection of U.S. Highway 90 West and Loop 13.

DRAINAGE AREA.--1.19 mi<sup>2</sup> (3.08 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1969 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 657.57 ft (220.427 m) above mean sea level.

REMARKS.--Water-discharge records fair. Recording rain gage located at station with one additional rain gage located in watershed.

AVERAGE DISCHARGE.--8 years, 0.55 ft<sup>3</sup>/s (0.0156 m<sup>3</sup>/s), 6.28 in/yr (160 mm/yr), 398 acre-ft/yr (491,000 m<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 555 ft<sup>3</sup>/s (15.7 m<sup>3</sup>/s) May 14, 1970, gage height 4.44 ft (1.353 m), from rating curve extended above 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) on basis of formula,  $Q=CLH^{3/2}$ ; no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--No historical flood information is available.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 90 ft<sup>3</sup>/s (2.55 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 4	2145	124	3.51	2.33	0.710	May 9	164	4.64	2.55	0.777	
aOct. 19	1330	68	1.93	1.99	0.607	Sept. 12	2345	336	9.52	3.42	1.042
Apr. 19	2100	*550	15.6	4.40	1.341						

a Water-quality samples obtained on this flood event.

b From floodmark.

Minimum discharge, no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.02	.00	.00	.08	.33	.74	.06	.36	.00	.00
2	.00	.02	.03	.08	.00	.08	.38	.74	.05	.14	.00	.00
3	.00	.02	.01	.02	.00	.19	.40	.91	.01	.23	.00	.00
4	9.3	.00	.04	.02	.00	.02	.80	1.1	.01	1.1	.00	.00
5	2.8	.00	2.1	.01	.00	.02	.25	1.1	.04	.95	.00	.00
6	.00	.00	.27	.01	.00	.02	.27	1.2	.06	1.2	.00	.00
7	.00	.00	.09	.02	.00	.08	.28	1.2	.04	.60	.00	.00
8	.00	.00	.02	.02	.02	.08	.40	.84	.02	.16	.00	.00
9	.00	.00	.02	.02	.02	.08	.51	12	.02	.08	.00	.00
10	.00	.00	.03	.00	.02	.08	.83	.14	.05	.07	.00	.00
11	.00	.00	.03	.00	.52	.08	.43	3.6	.02	.04	.00	.00
12	.00	.09	1.3	1.0	.00	.09	.51	.08	.02	.02	.00	5.0
13	.00	.22	.81	2.9	.00	.39	.54	.08	.07	.00	.00	17
14	.00	.00	.66	.10	.00	.39	.50	.08	.08	.00	.00	.00
15	14	.00	.03	.03	.00	.14	3.8	.08	.08	.00	.00	.00
16	1.4	.00	.02	.02	.00	.08	19	.08	.06	.00	.00	.00
17	.00	2.0	.02	.02	.00	.08	1.2	.08	.02	.00	.00	.00
18	.00	.02	.02	.02	.02	.08	.74	.08	.03	.00	.00	.00
19	12	7.7	.08	.02	.02	.08	45	.07	.00	.00	.00	.00
20	.02	.37	.04	.03	.02	.08	63	.04	.00	.00	.00	.00
21	.00	.20	.02	.02	.02	.09	.24	9.4	.00	.00	.00	.00
22	.00	.09	.02	6.1	.02	.27	.22	.08	.01	.00	.00	.00
23	.00	.08	.02	4.9	.08	.25	.19	.08	4.7	.00	.00	.00
24	1.6	.08	.02	.08	.08	.24	.19	.08	.58	.00	.00	.00
25	.02	2.6	1.5	.04	.19	.33	.19	.08	.60	.00	.00	.00
26	.00	.38	.02	.08	.08	.85	.25	.05	.74	.00	.00	.00
27	.00	.02	.02	.14	.19	.23	.33	.02	.91	.00	.00	.00
28	3.9	.02	.02	.11	.19	.31	.48	.02	1.2	.00	.00	.00
29	23	.02	.01	.08	---	.43	.61	.02	.86	.00	.00	.00
30	.08	.02	.02	6.0	---	.40	1.5	.03	.37	.00	.00	.00
31	.02	---	.00	.18	---	.44	---	.03	---	.00	.00	---
TOTAL	68.14	13.95	7.31	22.07	1.49	6.06	143.37	34.13	10.71	4.95	.00	22.00
MEAN	2.20	.47	.24	.71	.053	.20	4.78	1.10	.36	.16	.000	.73
MAX	23	7.7	2.1	6.1	.52	.85	63	12	4.7	1.2	.00	.17
MIN	.00	.00	.00	.00	.00	.02	.19	.02	.00	.00	.00	.00
CFSM	1.85	.40	.20	.60	.05	.17	4.02	.92	.30	.13	.000	.61
IN.	2.13	.44	.23	.69	.05	.19	4.48	1.07	.33	.15	.00	.69
AC-FT	135	28	14	44	3.0	12	284	68	21	9.8	.00	44
CAL YR 1976	TOTAL 252.37	MEAN .69	MAX 26	MIN .00	CFSM .58	IN 7.88	AC-FT 501					
WTR YR 1977	TOTAL 334.18	MEAN .92	MAX 63	MIN .00	CFSM .77	IN 10.44	AC-FT 663					

GUADALUPE RIVER BASIN

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08181450 LEON CREEK TRIBUTARY AT KELLY AIR FORCE BASE, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1969 to current year. Sediment analyses: October 1972 to September 1973.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM 7UM-MF (COL./ 100 ML)	
DATE	TIME			(UNITS)									
OCT 19...	1600	20	72	7.4	14.0	33	10	10.7	107	1.7	3700	580	
20...	1200	.02	133	7.1	13.0	40	20	8.4	82	1.5	10000	400	
APR 20...	1130	19	108	--	22.0	80	45	8.0	94	2.5	63000	13000	
21...	2122	360	50	8.4	19.0	90	160	8.8	98	2.4	7500	4800	
		FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
DATE													
OCT 19...	5400	30	0	11	.5	.6	.0	1.7	37	0	2.2	.7	
20...	2500	--	--	--	--	--	--	--	--	--	--	--	
APR 20...	24000	48	2	18	.6	1.0	.1	1.7	56	0	2.6	1.6	
21...	26000	20	0	7.2	.4	1.0	.1	1.4	22	2	1.3	.6	
		DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SIO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	METHY- LENE BLUE ACTIVE SUB- STANCE (MG/L)
DATE													
OCT 19...	.5	3.4	39	12	4	.18	.01	.00	.25	.09	2.4	.10	
20...	--	--	--	43	10	--	--	--	--	--	--	--	
APR 20...	.0	5.1	58	80	23	.38	.01	.06	.39	.16	8.2	.10	
21...	.0	1.7	26	452	116	.15	.01	.10	.48	.63	14	.00	



## GUADALUPE RIVER BASIN

08181450 LEON CREEK TRIBUTARY AT KELLY AIR FORCE BASE, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
OCT 19...	1600	1	100	0	0	0	0
APR 20...	1130	5	100	0	13	2	10
21...	2122	2	0	0	14	2	30

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
OCT 19...	2	0	--	--	0	10
APR 20...	2	0	.0	0	0	10
21...	3	0	.0	0	0	10

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
OCT 19...	1600	.2	.00	.00	.0	.00	.00	.00	.01	.00	.00	.00
APR 20...	1130	.1	.00	.00	.0	.04	.02	.13	.03	.00	.00	.00
21...	2122	1.0	.00	.00	.1	.42	.17	2.8	.01	.01	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 19...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
APR 20...	.00	.00	.00	.00	.00	.00	.00	0	.00	.03	.00	.00
21...	.00	.00	.00	.00	.00	.00	.00	0	.00	.03	.00	.00

## 08181500 MEDINA RIVER AT SAN ANTONIO, TX

LOCATION.--Lat 29°15'14". long 98°28'20", Bexar County, Hydrologic Unit 12100302, near left bank on downstream side of pier of upstream bridge of two bridges on U.S. Highway 281 in San Antonio and 6.8 mi (10.9 km) upstream from mouth.

DRAINAGE AREA.--1,317 mi<sup>2</sup> (3,411 km<sup>2</sup>), 634 mi<sup>2</sup> (1,642 km<sup>2</sup>) is above dam forming Medina lake.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1929 to December 1930, July 1939 to current year. October 1929 to December 1930 records below about 50 ft<sup>3</sup>/s (1.42 m<sup>3</sup>/s) in connection with seepage investigation (published as "at Losoya"). Published as "near San Antonio" July 1939 to September 1970.

REVISED RECORDS.--WSP 1562: 1957. WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 439.0 ft (133.81 m) above mean sea level (levels by Corps of Engineers). October 1929 to December 1930 nonrecording gage at Losoya 1.5 mi (2.4 km) downstream at different datum.

REMARKS.--Water-discharge records good. Flow is slightly regulated by Medina Lake (station 08179500) 60 mi (97 km) upstream and diversion dam reservoir, capacity 4,500 acre-ft (5.55 hm<sup>3</sup>). For diversion of canal records, see Medina Canal near Riomedina (station 08180000). For statement concerning losses into the Edwards and associated limestones formation, see Medina River near Somerset (station 08180800). Several small diversions below diversion dam reservoir. Records furnished by city of San Antonio show that during the current year they released approximately 4,770 acre-ft (5.88 hm<sup>3</sup>) of sewage effluent from Mitchell Lake into river above gage during periods of high water, and 19,860 acre-ft (24.5 hm<sup>3</sup>) of sewage effluent into the river just above the Mitchell Lake discharge point from the Leon Creek plant. A considerable part of the low flow is waste water from Kelly Field Air Force Base which enters via Leon Creek. City of San Antonio Sanitation Department temperature and gage-height tele-meter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,900 ft<sup>3</sup>/s (903 m<sup>3</sup>/s) July 17, 1973, gage height, 43.59 ft (13.286 m); minimum daily, 3.3 ft<sup>3</sup>/s (0.093 m<sup>3</sup>/s) Apr. 18, Nov. 1, 1956, Jan. 24, 1957.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage, 55 ft (16.8 m) sometime prior to construction of Medina Dam in 1913, from information by State Highway Department.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft<sup>3</sup>/s (42.5 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 5	2200	1,530 43.3	12.75 3.886	Apr. 20	1500	3,980 113	21.10 6.431
Oct. 30	0900	4,390 124	19.68 5.998	Sept. 13	2030	*4,620 131	21.46 6.541

Minimum discharge, 105 ft<sup>3</sup>/s (2.97 m<sup>3</sup>/s) Aug. 26, Sept. 3, 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	355	1720	530	581	721	484	324	860	685	403	141	111
2	322	1530	520	555	661	460	306	857	668	377	140	109
3	295	1370	515	553	651	445	296	820	715	368	139	107
4	279	1220	510	551	653	481	313	797	723	348	138	107
5	994	1100	515	542	617	506	308	765	663	333	134	109
6	671	999	540	538	596	485	293	735	598	318	134	118
7	427	882	550	539	583	475	270	712	559	300	134	132
8	363	843	530	525	575	452	259	695	530	285	134	145
9	322	798	502	515	588	439	246	760	496	272	134	137
10	288	754	510	513	603	414	238	1190	462	260	128	129
11	265	725	503	538	626	408	237	971	438	248	129	123
12	248	679	618	676	637	399	236	1050	421	239	129	120
13	236	692	704	748	632	387	234	1540	416	226	131	1840
14	226	673	762	775	624	375	261	1600	399	214	129	1520
15	237	660	807	699	616	390	254	1330	410	200	127	294
16	576	670	793	613	604	372	593	1170	402	192	126	243
17	691	700	790	545	591	349	635	1070	394	187	124	207
18	761	770	782	530	584	353	684	1000	369	187	124	189
19	707	900	785	519	579	345	751	951	343	182	119	181
20	774	850	794	504	571	338	3020	884	325	177	115	176
21	678	770	790	494	568	336	2540	1010	314	177	114	166
22	581	700	745	513	557	317	1440	974	312	172	112	154
23	521	650	707	819	529	307	1280	1010	339	168	111	152
24	541	610	693	783	524	292	1190	971	522	164	111	149
25	1020	570	696	685	527	286	1110	913	541	165	109	146
26	901	700	705	637	516	293	1030	844	572	160	108	144
27	726	680	682	603	528	309	966	800	556	154	108	140
28	669	640	651	588	515	323	918	763	522	152	118	131
29	2340	610	628	559	---	348	870	746	478	149	117	128
30	3720	580	612	579	---	344	857	736	439	147	115	124
31	2110	---	588	759	---	335	---	709	---	144	111	---
TOTAL	22844	25045	20057	18578	16576	11847	21959	29233	14611	7068	3843	7531
MEAN	737	835	647	599	592	382	732	943	487	228	124	251
MAX	3720	1720	807	819	721	506	3020	1600	723	403	141	1840
MIN	226	570	502	494	515	286	234	695	312	144	108	107
AC-FT	45310	49680	39780	36850	32880	23500	43560	57980	28980	14020	7620	14940

CAL YR 1976	TOTAL	151333	MEAN	413	MAX	6150	MIN	75	AC-FT	300200
WTR YR 1977	TOTAL	199192	MEAN	546	MAX	3720	MIN	107	AC-FT	395100

## GUADALUPE RIVER BASIN

08181500 MEDINA RIVER AT SAN ANTONIO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1970 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	HARD- NESS (CA+MG) (MG/L)
OCT 22...	1215	576	496	7.7	18.0	7	50	8.4	91	1.6	220
NOV 19...	1430	880	696	7.8	14.0	25	140	7.2	72	2.5	280
DEC 17...	1340	796	569	7.9	14.0	15	30	9.5	95	.8	260
JAN 14...	1355	743	823	7.9	11.5	35	25	9.7	92	5.1	310
FEB 18...	1410	584	637	7.7	15.0	0	20	8.6	88	1.9	280
MAR 18...	1325	346	687	7.7	20.5	0	25	7.7	88	2.4	290
APR 15...	1300	232	803	7.5	20.0	0	20	7.0	80	3.3	330
MAY 20...	0940	875	570	7.0	23.0	0	40	8.4	100	3.5	250
JUN 10...	1345	455	668	7.6	26.5	0	20	6.7	85	.6	290
JUL 15...	1250	192	805	7.4	27.0	0	15	5.7	72	4.4	310
AUG 19...	1425	117	836	7.5	28.0	5	9	5.4	69	3.3	320
SEP 16...	1400	238	719	7.7	26.0	35	75	7.0	88	2.0	260

DATE	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)
OCT 22...	53	65	15	19	.6	2.8	209	0	50	27	.3
NOV 19...	96	81	18	42	1.1	3.8	220	0	84	60	.3
DEC 17...	65	75	17	24	.7	2.5	235	0	64	35	.2
JAN 14...	110	90	20	54	1.3	6.6	246	0	90	83	.3
FEB 18...	68	81	18	29	.8	2.6	254	0	69	41	.2
MAR 18...	67	82	20	34	.9	2.9	268	0	68	48	.2
APR 15...	91	94	22	43	1.0	3.3	286	0	76	67	.2
MAY 20...	56	71	18	22	.6	2.1	238	0	60	34	.2
JUN 10...	79	84	20	33	.8	2.5	260	0	74	43	.4
JUL 15...	79	89	21	49	1.2	3.4	280	0	90	64	.3
AUG 19...	85	93	22	50	1.2	3.6	290	0	88	69	.3
SEP 16...	74	77	17	45	1.2	5.4	230	0	86	66	.3

## GUADALUPE RIVER BASIN

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08181500 MEDINA RIVER AT SAN ANTONIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)
OCT 22...	11	293	114	26	.53	.01	.04	.57	.24	3.0	0
NOV 19...	12	410	300	38	1.5	.02	.11	.99	.30	8.1	0
DEC 17...	12	346	78	10	1.4	.02	.18	.34	.21	3.6	0
JAN 14...	13	478	52	10	3.1	.09	.32	1.6	1.7	6.8	5
FEB 18...	12	378	46	12	1.9	.08	.57	.18	.20	2.6	18
MAR 18...	12	399	53	9	2.6	.19	.57	.39	.32	5.2	0
APR 15...	13	460	42	11	3.7	.35	.71	.59	.49	6.3	0
MAY 20...	12	337	102	18	1.6	.07	.32	.04	.19	4.8	1
JUN 10...	13	398	50	10	2.6	.11	.15	.26	.25	4.3	1
JUL 15...	14	469	34	9	4.0	.38	.90	.50	.92	3.9	1
AUG 19...	15	484	15	0	5.7	.57	.57	1.6	.49	4.3	3
SEP 16...	14	424	140	26	2.9	.08	.28	.55	.61	5.8	1

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
FEB 18...	1410	0	100	0	9	0	0
APR 15...	1300	1	100	0	0	0	10
JUN 10...	1345	0	100	0	10	1	40
AUG 19...	1425	0	300	0	0	1	0

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
FEB 18...	0	20	.0	0	0	10
APR 15...	0	10	.9	1	0	0
JUN 10...	1	10	.0	1	0	0
AUG 19...	0	20	.0	0	0	10

## GUADALUPE RIVER BASIN

08181500 MEDINA RIVER AT SAN ANTONIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
FEB 18...	1410	.0	10	.00	.00	.0	.0	4	.00	.1	.00	3.1
JUN 1...	1345	--	9	--	--	.0	--	3	--	.7	--	2.4
JUL 15...	1250	.0	16	.00	.00	.0	.0	3	.00	.5	.00	1.0
AUG 19...	1425	.1	0	.00	.00	.0	.0	0	.00	.0	.00	.1
DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
FEB 18...	.00	.6	.01	.00	.2	.00	.0	.00	.00	.0	.00	.0
JUN 1...	--	4.2	--	--	.1	--	.0	--	--	.0	--	.0
JUL 15...	.00	.0	.04	.00	.2	.00	.0	.00	.00	.0	.00	.0
AUG 19...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PAPA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
FEB 18...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
JUN 1...	--	2.6	--	--	--	--	--	0	--	--	--	--
JUL 15...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
AUG 19...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00

## 08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX

LOCATION.--Lat 29°14'15", Long 98°21'43", Bexar County, Hydrologic Unit 12100301, on left bank 2,000 ft (610 m) downstream from Braunig Plant Lake, 2.2 mi (3.5 km) southwest of Elmendorf, and 205.5 mi (330.6 km) upstream from mouth. Water-quality sampling site at Farm Road 1604, 2.5 mi (4.0 km) downstream.

DRAINAGE AREA.--1,743 mi<sup>2</sup> (4,514 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1962 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 392.50 ft (119.634 m) above mean sea level.

REMARKS.--Water-discharge records good. Flow slightly regulated by Medina Lake (station 08179500) and Olmos flood-control reservoir, combined capacity, 269,500 acre-ft (332 hm<sup>3</sup>). Storage began in Medina Reservoir in 1913, and Olmos Dam was completed in 1926. Water is diverted above station from Medina River for irrigation in the vicinity of Devine and Lytle with some water diverted for irrigation near San Antonio. Records furnished by the city of San Antonio show that during the current year 21,280 acre-ft (26.2 hm<sup>3</sup>) of sewage effluent was discharged into the San Antonio River from the Salado Creek Plant and 99,980 acre-ft (123 hm<sup>3</sup>) from the Rilling Road Plant, about 7.5 and 15.5 mi (12.1 and 24.9 km), respectively, upstream from this station; records furnished by the San Antonio City Public Service Board show that at pump plant 1,700 ft (518 m) upstream from this station 6,650 acre-ft (8.20 hm<sup>3</sup>) was pumped into the Braunig Plant Lake and 4,490 acre-ft (5.54 hm<sup>3</sup>) was pumped into Calaveras Lake. During the current year, 120 acre-ft (0.148 hm<sup>3</sup>) was released from Braunig Lake. For additional information relative to sewage effluent, see Medina River at San Antonio (station 08181500).

AVERAGE DISCHARGE.--15 years, 498 ft<sup>3</sup>/s (14.10 m<sup>3</sup>/s), 360,800 acre-ft/yr (445 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 40,000 ft<sup>3</sup>/s (1,130 m<sup>3</sup>/s) Sept. 27, 1973, gage height, 47.60 ft (14.508 m); minimum, 12 ft<sup>3</sup>/s (0.34 m<sup>3</sup>/s) Aug. 24-26, 1963.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1900, 61 ft (18.6 m) in 1946. Second highest was 53 ft (16.2 m) in 1913, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,000 ft<sup>3</sup>/s (85.0 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 16	0500	3,080 87.2	18.70 5.700	Apr. 20	1800	*18,000 510	35.02 10.674
Oct. 29	1900	8,810 249	a28.86 8.797	May 10	0900	4,190 119	21.34 6.504
Apr. 16	2000	3,710 105	20.20 6.156	Sept. 14	0500	4,880 138	22.56 6.876

a From floodmark.

Minimum discharge, 245 ft<sup>3</sup>/s (6.94 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	549	2050	872	945	1330	898	705	1260	1080	703	401	343
2	498	1860	853	967	1180	881	694	1230	1170	707	378	342
3	422	1690	843	978	1220	887	683	1180	1020	682	384	338
4	422	1560	824	955	1160	995	760	1160	1030	656	391	328
5	2090	1430	1140	935	1090	939	698	1130	974	577	389	331
6	1110	1330	1720	935	1040	895	650	1090	919	522	379	415
7	589	1240	1160	931	1030	895	632	1060	888	502	381	455
8	519	1210	960	906	1050	866	614	1030	849	476	383	390
9	465	1140	918	906	1050	856	589	1500	820	457	380	396
10	423	1110	906	900	1080	846	568	2730	800	437	375	380
11	430	1080	900	884	1360	835	566	1660	766	436	371	365
12	408	1030	1120	1080	1440	797	570	1460	749	503	376	369
13	402	1190	1280	1590	1130	788	593	1700	734	528	368	1730
14	393	1060	1390	1510	1100	784	1780	1920	714	515	365	3050
15	515	1020	1280	1170	1090	797	1460	1670	720	474	336	668
16	2330	973	1210	1050	1060	794	3040	1480	718	480	321	549
17	880	1340	1190	939	1050	768	2030	1370	699	471	310	490
18	876	1120	1170	919	1030	769	1210	1310	662	484	321	466
19	1300	2010	1190	895	1010	746	1350	1250	623	488	355	465
20	1720	1730	1230	888	990	722	13300	1200	610	481	308	465
21	891	1180	1190	870	994	719	9030	2090	606	471	301	413
22	825	1050	1150	1060	1010	711	2450	1730	634	463	298	391
23	799	992	1100	2530	976	689	1780	1450	840	452	297	402
24	1300	941	1070	1570	950	689	1650	1340	1070	443	294	422
25	1370	949	1150	1190	948	684	1520	1270	865	443	292	413
26	1260	1350	1110	1100	941	699	1440	1210	883	443	305	379
27	1010	1130	1080	1040	927	772	1360	1140	850	394	328	350
28	1080	999	1050	1010	934	800	1320	1110	791	420	339	334
29	5670	969	1010	965	---	771	1260	1080	764	436	355	305
30	6250	909	998	1250	---	756	1330	1070	722	448	356	283
31	2890	---	961	2000	---	724	---	1050	---	415	349	---
TOTAL	39686	37642	34025	34868	30170	24772	55632	42930	24570	15407	10786	16027
MEAN	1280	1255	1098	1125	1078	799	1854	1385	819	497	348	534
MAX	6250	2050	1720	2530	1440	995	13300	2730	1170	707	401	3050
MIN	393	909	824	870	927	684	566	1030	606	394	292	283
AC-FT	78720	74660	67490	69160	59840	49140	110300	85150	48730	30560	21390	31790
CAL YR 1976	TOTAL	281083	MEAN	768	MAX	9580	MIN	224	AC-FT	557500		
WTR YR 1977	TOTAL	366515	MEAN	1004	MAX	13300	MIN	283	AC-FT	727000		



08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1966 to current year. Chemical, biochemical, and pesticide analyses: January 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1966 to current year.

WATER TEMPERATURES: October 1966 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,240 micromhos Jan. 29, 1973, Aug. 8, 1975; minimum daily, 263 micromhos Sept. 27, 1973.

WATER TEMPERATURES: Maximum daily, 32.0°C June 21, 1969; minimum daily, 5.5°C Jan. 10, 1973.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 873 micromhos July 28, Aug. 3, 12; minimum daily, 351 micromhos Apr. 20.

WATER TEMPERATURES: Maximum daily, 30.5°C Aug. 2; minimum daily, 10.5°C Jan. 31, Feb. 1.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)
OCT 22...	1130	828	579	7.7	18.0	15	50	8.0	87	4.1	230	45
NOV 19...	1345	2260	499	7.7	15.5	30	120	7.0	72	5.7	210	48
DEC 17...	1300	1160	673	7.6	16.0	10	25	7.6	79	8.4	270	55
JAN 14...	1315	1530	766	7.7	12.5	40	40	8.8	85	8.8	280	80
FEB 18...	1300	1000	732	7.5	17.0	0	15	6.4	68	8.3	--	--
MAR 18...	1250	723	761	7.5	21.5	0	15	5.5	64	14	--	--
APR 15...	1200	1310	760	7.5	21.5	0	45	5.8	67	12	280	58
MAY 13...	1145	1660	627	7.3	24.0	5	110	6.7	82	8.2	240	54
JUN 10...	1150	789	747	7.4	27.0	0	20	5.4	68	6.0	290	69
JUL 15...	1200	478	848	7.4	28.0	0	7	4.0	51	7.9	280	40
AUG 19...	1305	327	849	7.3	29.5	15	5	3.6	47	8.5	290	48
SEP 16...	1310	535	714	7.6	27.0	35	70	5.8	73	13	--	--

[illegible]

GUADALUPE RIVER BASIN

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08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	METHY- LENE BLUE ACTIVE SUB- STANCE (MG/L)
OCT 22...	339	95	14	1.8	.19	.77	.83	.63	3.4	1	.10
NOV 19...	292	294	58	1.4	.11	.48	1.3	.81	9.4	6	.10
DEC 17...	396	72	13	1.6	.33	.88	.72	.83	5.8	10	.10
JAN 14...	448	83	13	2.5	.25	.74	2.1	1.7	6.7	6	.20
FEB 18...	--	49	8	1.9	.47	1.4	1.1	1.1	7.0	20	.10
MAR 18...	--	33	0	2.5	.91	1.4	.90	1.7	4.8	0	.10
APR 15...	434	128	28	3.4	.01	1.4	1.5	.91	5.5	0	.10
MAY 13...	366	308	30	1.5	.25	1.1	.80	.86	9.6	1	.10
JUN 10...	434	61	11	2.6	.75	1.1	.60	1.0	4.9	1	.10
JUL 15...	482	23	5	3.6	1.0	2.0	.80	1.5	5.8	3	.10
AUG 19...	477	10	0	4.7	.00	2.3	1.6	2.3	6.3	4	.10
SEP 16...	--	157	31	2.7	.44	1.8	.50	3.8	7.4	2	.10

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
FEB 18...	1300	1	200	0	5	2	10
APR 15...	1200	2	200	0	3	2	10
JUN 10...	1150	1	100	0	0	2	20
AUG 19...	1305	0	100	0	0	1	20

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
FEB 18...	2	10	.0	0	0	10
APR 15...	0	30	.0	1	0	10
JUN 10...	2	10	.0	1	0	10
AUG 19...	3	20	.0	0	0	20

## GUADALUPE RIVER BASIN

08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
FEB 18...	1300	.0	18	.00	.00	.0	.0	6	.00	.2	.00	1.9
APR 15...	1200	.0	--	.00	.00	--	.0	--	.00	--	.00	--
JUN 10...	1150	.0	42	.00	.00	.0	.0	.12	.00	3.1	.00	5.2
AUG 19...	1305	.0	46	.00	.00	.0	.0	22	.00	3.2	.00	2.9

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
FEB 18...	.00	.1	.09	.00	.5	.00	.0	.00	.00	.0	.00	.0
APR 15...	.00	--	.18	.00	--	.00	--	.00	.00	--	.00	--
JUN 10...	.00	2.8	.40	.00	.7	.00	.0	.00	.00	.2	.00	.1
AUG 19...	.00	1.2	.38	.00	1.4	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
FEB 18...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
APR 15...	.00	--	.01	.00	.00	.00	0	--	.00	.00	.12	.00
JUN 10...	.00	.1	.00	.00	.00	.00	0	0	.00	.00	.07	.00
AUG 19...	.00	.0	.00	.00	.00	.00	0	0	.00	.66	.01	.01

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	39686	492	280	30200	33	3540	42	4510	200
NOV. 1976.....	37642	620	360	36300	50	5040	55	5630	250
DEC. 1976.....	34025	706	410	37200	60	5550	64	5910	270
JAN. 1977.....	34868	725	420	39200	63	5920	66	6240	270
FEB. 1977.....	30170	744	430	34800	65	5320	68	5570	280
MAR. 1977.....	24772	772	440	29700	69	4600	71	4760	290
APR. 1977.....	55632	546	310	47200	40	6000	48	7160	220
MAY 1977.....	42930	638	370	42500	52	6000	57	6640	250
JUNE 1977.....	24570	728	420	27800	63	4200	67	4420	270
JULY 1977.....	15407	800	460	19200	73	3020	74	3080	290
AUG. 1977.....	10786	843	480	14100	78	2270	79	2290	300
SEPT 1977.....	16027	707	410	17600	61	2620	64	2780	270
TOTAL .....	366515	**	**	376000	**	54100	**	59000	**
WTD.AVG. ....	1004.15	661	380	**	55	**	60	**	260

08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	636	521	743	723	692	750	763	705	705	712	805	851
2	661	560	750	709	744	760	781	666	640	723	856	858
3	668	566	750	713	763	771	763	682	683	730	873	861
4	680	580	743	720	782	745	768	688	675	728	859	851
5	388	593	650	730	776	760	755	693	673	732	849	845
6	450	610	595	735	756	750	771	698	693	744	859	814
7	588	608	686	728	746	733	776	705	717	764	846	796
8	624	610	710	735	768	755	792	694	740	775	815	805
9	646	637	740	743	767	760	798	674	753	777	824	811
10	675	646	755	735	755	770	785	384	777	796	863	838
11	702	656	745	726	742	776	800	694	774	772	866	820
12	705	663	743	799	680	799	821	705	792	814	873	796
13	728	651	705	758	718	760	804	664	772	808	859	502
14	745	640	726	790	720	755	557	598	775	830	866	428
15	670	644	738	787	753	765	765	590	792	853	824	668
16	462	667	728	782	736	776	451	636	772	866	800	743
17	573	610	701	787	750	771	509	627	765	847	840	782
18	562	631	686	770	767	782	666	654	781	814	837	800
19	500	499	670	753	759	787	659	668	787	860	849	811
20	406	566	678	758	735	782	351	660	783	853	840	802
21	558	644	703	765	719	775	430	600	831	838	859	842
22	597	671	692	700	750	766	619	548	846	841	815	871
23	645	687	703	551	762	787	620	602	756	828	809	832
24	502	693	710	673	766	743	640	634	682	832	856	838
25	450	709	705	748	760	799	646	652	715	828	853	858
26	544	650	686	753	753	822	653	673	685	814	853	838
27	570	679	697	765	728	787	659	676	646	844	866	820
28	619	693	710	760	721	776	665	683	669	873	853	830
29	366	687	715	753	---	793	673	689	670	847	815	848
30	423	707	721	728	---	785	685	690	712	796	809	858
31	461	---	722	625	---	776	---	693	---	850	837	---
MEAN	574	633	710	736	745	773	681	652	735	806	843	797

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24.0	16.5	14.0	11.0	10.5	16.0	19.5	21.0	25.0	26.5	29.0	28.5
2	25.0	17.0	14.0	11.0	13.0	16.5	20.0	23.0	24.5	26.0	30.5	28.0
3	23.0	18.0	14.5	12.0	14.5	19.0	21.0	23.5	25.0	26.0	30.0	28.0
4	25.0	19.0	16.0	13.0	14.0	17.0	21.5	23.5	25.0	26.0	30.0	28.0
5	23.0	18.0	17.0	13.5	15.0	17.0	20.0	24.5	23.0	27.0	29.0	---
6	21.5	19.0	17.0	13.5	15.0	16.0	19.5	23.5	26.5	28.0	29.0	28.5
7	21.0	19.0	14.0	14.0	14.5	15.5	20.0	23.0	26.0	27.0	28.0	27.0
8	20.0	18.0	14.5	15.0	14.5	16.0	20.5	24.0	28.5	28.0	29.0	27.0
9	18.0	19.0	15.0	14.0	15.0	16.5	21.0	23.5	28.0	26.0	29.5	28.0
10	20.0	20.5	16.5	13.0	15.0	18.0	21.0	21.5	28.0	28.0	29.5	29.0
11	20.5	20.5	16.0	12.0	16.5	19.0	20.5	24.0	25.0	27.0	28.5	27.0
12	21.0	18.0	16.0	11.5	17.0	18.0	21.5	23.0	26.0	28.5	29.0	28.5
13	21.0	16.0	15.0	13.0	16.0	20.0	21.5	24.0	27.0	27.0	28.0	25.5
14	22.0	14.0	15.5	13.0	15.5	19.0	20.5	22.0	26.5	---	27.0	25.5
15	23.0	14.0	14.0	14.0	15.5	20.5	21.5	24.0	28.0	28.5	29.0	28.5
16	21.0	14.5	15.0	13.0	16.0	20.5	20.0	24.0	26.5	28.0	29.0	27.0
17	20.0	14.5	15.5	11.0	15.5	21.0	19.0	23.5	26.5	28.0	29.0	25.0
18	19.5	14.0	16.0	11.5	15.5	21.0	19.5	23.5	26.0	28.0	29.0	27.0
19	20.5	17.0	18.0	11.0	17.0	21.0	21.0	24.0	26.0	29.0	29.0	28.0
20	16.5	17.0	16.0	11.5	17.0	21.0	20.5	24.0	27.0	29.0	28.0	27.0
21	15.5	17.0	14.5	13.0	15.5	20.0	21.0	24.0	28.0	28.5	30.0	28.0
22	18.0	16.5	14.0	16.0	16.5	18.5	---	23.0	27.0	29.0	29.5	28.0
23	22.0	16.5	14.0	15.0	18.5	18.5	21.0	24.0	26.0	27.0	29.5	27.0
24	21.0	16.5	---	14.0	16.5	18.5	20.0	24.5	25.5	27.0	29.5	26.0
25	---	19.0	17.0	14.5	18.0	19.0	21.0	24.5	27.0	29.5	29.5	28.0
26	18.0	---	15.0	14.5	18.0	20.0	23.5	24.5	26.0	29.0	29.0	29.0
27	19.0	18.0	14.0	---	17.0	21.0	23.0	25.0	26.5	28.5	28.0	28.5
28	18.5	15.0	14.5	13.0	15.5	16.5	22.0	25.0	28.5	29.5	28.0	28.5
29	13.0	13.0	14.5	14.0	---	20.0	23.0	25.0	28.5	29.0	28.5	28.5
30	15.0	13.0	14.5	14.0	---	21.0	21.0	---	27.0	27.0	28.5	28.0
31	15.0	---	---	10.5	---	20.5	---	25.0	---	28.0	28.5	---
MEAN	20.0	17.0	15.0	13.0	15.5	19.0	21.0	23.5	26.5	28.0	29.0	27.5

## GUADALUPE RIVER BASIN

## 08182400 CALAVERAS CREEK SUBWATERSHED NO. 6 NEAR ELMENDORF, TX

LOCATION.--Lat 29°22'49", long 98°17'33", Bexar County, Hydrologic Unit 12100301, near center of dam on Chupaderas Creek, a tributary to Calaveras Creek, 0.5 mi (0.8 km) north of Sayers, 9.1 mi (14.6 km) north of Elmdorf, and 9.2 mi (14.8 km) upstream from mouth.

DRAINAGE AREA.--7.01 mi<sup>2</sup> (18.16 km<sup>2</sup>).

PERIOD OF RECORD.--December 1956 to September 1977 (discontinued).

REVISED RECORDS.--WSP 2123: 1957-65.

GAGE.--Water-stage recorder and concrete drop-inlet control. Datum of gage is 516.06 ft (157.295 m) above mean sea level (levels by Soil Conservation Service).

REMARKS.--Records good. Pool is formed by an earthfill dam that was completed Dec. 15, 1956. The outlet structure is a 36-inch (914 mm) square concrete drop inlet connected to a 17-inch (432 mm) concrete outlet pipe. The top of the drop inlet is at a gage height of 18.00 ft (5.486 m); the bottom of four 8- by 8-inch (203 by 203 mm) uncontrolled openings are at a gage height of 14.80 ft (4.511 m); the right spillway is at a gage height of 34.3 ft (10.45 m); the left spillway is at a gage height of 34.5 ft (10.52 m). A controlled 8-inch (203 mm) sluice gate is located in the upstream face of the drop-inlet structure at a gage height of 8.52 ft (2.597 m). Pool capacity, 1,640 acre-ft (2.02 hm<sup>3</sup>) at spillway crest, 107 acre-ft (0.132 hm<sup>3</sup>) at top of the drop inlet, and 4.2 acre-ft (5,180 m<sup>3</sup>) at bottom of sluice gate. The capacity table is based on a sedimentation survey made Mar. 12, 1968. Rainfall records are collected from a recording gage located at station.

AVERAGE INFLOW.--20 years (1957-77), 1,183 acre-ft/yr (1.46 hm<sup>3</sup>/yr).

AVERAGE OUTFLOW.--20 years (1957-77), 1,138 acre-ft/yr (1.40 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum inflow, 4,770 ft<sup>3</sup>/s (135 m<sup>3</sup>/s), average for 5-minute interval, June 8, 1975, computed from change in pool contents and adjusted for outflow and rainfall on pool surface; no inflow at times. Maximum outflow, 2,900 ft<sup>3</sup>/s (82.1 m<sup>3</sup>/s) Sept. 27, 1973, gage height, 36.14 ft (11.015 m), from floodmark, from rating curve extended above 45 ft<sup>3</sup>/s (1.27 m<sup>3</sup>/s) on basis of flow-over-spillway measurement (includes two spillways) of 2,850 ft<sup>3</sup>/s (80.7 m<sup>3</sup>/s) plus flow through the drop inlet; no outflow for many days each year.

EXTREMES FOR CURRENT YEAR.--Peak inflow above base of 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)		Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	
Oct. 16	0115	a165	4.67	Feb. 11	1100	a130	3.68
Oct. 19	1645	a124	3.51	Apr. 16	0945	a588	16.6
Oct. 23	1700	100	2.83	Apr. 20	0105	a1,160	32.9
Oct. 28	1600	200	5.66				

a Average for 5-minute interval.

NOTE.--Inflow computed and adjusted as explained above.

Minimum discharge, no inflow for many days. Maximum outflow, 42.7 ft<sup>3</sup>/s (1.21 m<sup>3</sup>/s) Apr. 20, gage height, 28.77 ft (8.769 m); no outflow most of year.

## POOL WATER BUDGET, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
Inflow 1/	823	70.6	100	147	123	8.9	1,090	10.8	2.0	0	0	13.0
Outflow	513	360	93.9	116	142	4.6	1,050	26.5	0	0	0	0
(+)	+300.4	-300.9	0	+26.1	-26.1	-3.8	+29.1	-28.0	-11.2	-13.4	-9.5	+6.7
(++)	7.56	1.86	1.23	2.01	1.08	.46	7.61	1.26	1.57	.02	0	3.55
CAL YR 1976: Inflow	1,642			1,510		+35.1						
WTR YR 1977: Inflow	2,390			2,300		-30.6						
								34.79				
								28.21				

1/ Inflow adjusted for rainfall on pool and pool losses.

+ Change in contents, in acre-feet.

++ Rainfall, in inches.

## 08183500 SAN ANTONIO RIVER NEAR FALLS CITY, TX

LOCATION.--Lat 28°57'05", long 98°03'50", Karnes County, Hydrologic Unit 12100303, on left bank 23 ft (7 m) downstream from bridge on Farm Road 791, 0.9 mi (1.4 km) upstream from Scared Dog Creek, 3.6 mi (5.8 km) southwest of Falls City, and 150.5 mi (242.2 km) upstream from mouth.

DRAINAGE AREA.--2,113 mi<sup>2</sup> (5,473 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1925 to current year.

REVISED RECORDS.--WSP 1732: 1947(M). WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 285.49 ft (87.017 m) above mean sea level.

REMARKS.--Water-discharge records good. Diversion and regulation above station, see REMARKS for Salado Creek (upper station) at San Antonio (station 08178700), Medina River at San Antonio (station 08181500), and San Antonio River near Elmendorf (station 08181800). Flow slightly regulated by Calaveras Lake on Calaveras Creek which enters San Antonio River downstream from San Antonio River near Elmendorf. Records furnished by San Antonio City Public Service Board show that during the current year 5,460 acre-ft (6.73 hm<sup>3</sup>) was released into Calaveras Creek from Calaveras Lake.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47,400 ft<sup>3</sup>/s (1,340 m<sup>3</sup>/s) Sept. 29, 1946, gage height, 33.80 ft (10.302 m), from floodmark); minimum, 15 ft<sup>3</sup>/s (0.42 m<sup>3</sup>/s) June 27, 28, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1875, that of Sept. 29, 1946. Flood in October 1913 reached a stage of 28.4 ft (8.66 m), from floodmark, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,800 ft<sup>3</sup>/s (51.0 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 7	0100	2,030 57.5	4.01 1.222	Jan. 15	0500	1,840 52.1	3.79 1.155
Oct. 17	2000	2,090 59.2	4.10 1.250	Jan. 25	0100	2,420 68.5	4.53 1.381
Oct. 21	1100	2,010 56.9	3.99 1.216	Feb. 1	1300	2,090 59.2	4.10 1.250
Oct. 24	1800	2,060 58.3	4.05 1.234	Apr. 16	1100	7,490 212	12.13 3.697
Nov. 1	0200	4,780 135	8.05 2.454	Apr. 22	1300	*12,300 348	17.82 5.432
Nov. 21	0500	2,150 60.9	4.18 1.274	May 11	2400	3,000 85.0	5.36 1.634
Nov. 26	0400	2,280 64.6	4.34 1.323	May 23	0500	2,680 75.9	4.88 1.487
Dec. 5	2400	2,120 60.0	4.14 1.262	Sept. 15	1600	2,620 74.2	4.79 1.460
Dec. 7	1200	1,870 53.0	3.83 1.167				

Minimum discharge, 252 ft<sup>3</sup>/s (7.14 m<sup>3</sup>/s) Aug. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	751	4380	1110	1080	2000	1030	830	1610	1280	830	439	334
2	600	2770	1060	1060	1670	1010	808	1590	1280	788	417	322
3	591	2060	1030	1060	1380	979	793	1490	1430	788	400	319
4	499	1880	1020	1090	1370	978	770	1450	1260	760	388	319
5	986	1750	1300	1080	1330	1070	813	1390	1250	731	399	310
6	1500	1650	1550	1060	1260	1050	822	1350	1200	680	399	298
7	1690	1550	1800	1050	1190	1010	756	1310	1130	593	388	311
8	752	1450	1490	1050	1160	997	718	1270	1080	569	382	451
9	561	1390	1130	1030	1170	975	697	1240	1030	549	380	391
10	497	1350	1050	1020	1200	967	681	1470	996	521	385	378
11	426	1290	1020	1030	1290	948	658	2630	954	498	384	368
12	399	1230	1010	1030	1530	945	641	2540	916	479	380	350
13	393	1210	1150	1210	1670	923	661	2050	885	498	382	340
14	370	1300	1570	1630	1380	893	907	1990	866	569	382	1050
15	367	1260	1620	1780	1260	884	1550	2160	850	569	369	2410
16	553	1180	1480	1420	1250	890	4980	2060	839	521	358	1230
17	1760	1150	1370	1230	1210	892	2840	1830	845	516	322	616
18	1450	1360	1320	1100	1220	867	2770	1710	828	512	308	549
19	1020	1390	1310	1050	1240	862	1740	1620	796	502	298	513
20	1140	1680	1310	1030	1210	842	4560	1540	746	516	341	489
21	1900	2040	1350	1010	1120	827	8940	1500	698	512	316	495
22	1260	1520	1340	1020	1090	808	11800	1970	695	498	288	470
23	951	1280	1290	1260	1100	803	7990	2530	729	493	278	382
24	1290	1210	1230	2090	1080	774	3080	2020	912	479	280	431
25	1380	1180	1200	2130	1060	777	2080	1690	1200	461	271	446
26	1660	1870	1250	1460	1040	779	1880	1590	1030	452	263	448
27	1530	1530	1280	1290	1030	779	1760	1500	991	466	259	429
28	1240	1440	1210	1210	1030	852	1680	1420	978	430	298	384
29	1970	1240	1170	1150	---	882	1680	1370	910	413	309	364
30	2580	1170	1130	1120	---	872	1700	1330	876	435	326	345
31	4020	---	1100	1230	---	852	---	1310	---	470	340	---
TOTAL	36086	47760	39250	38060	35540	28017	71585	52530	29480	17098	10729	15542
MEAN	1164	1592	1266	1228	1269	904	2386	1695	983	552	346	518
MAX	4020	4380	1800	2130	2000	1070	11800	2630	1430	830	439	2410
MIN	367	1150	1010	1010	1030	774	641	1240	695	413	259	298
AC-FT	71580	94730	77850	75490	70490	55570	142000	104200	58470	33910	21280	30830
CAL YR 1976	TOTAL	305861	MEAN	836	MAX	6640	MIN	245	AC-FT	606700		
WTR YR 1977	TOTAL	421677	MEAN	1155	MAX	11800	MIN	259	AC-FT	836400		



## GUADALUPE RIVER BASIN

08183500 SAN ANTONIO RIVER NEAR FALLS CITY, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January 1968 to current year. Sediment analyses: January 1966 to September 1975.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	HARD- NESS (CA+MG) (MG/L)	
OCT 22...	1030	1260	422	7.4	16.5	7.4	78	4.0	170	
NOV 19...	1220	1400	588	7.6	14.0	6.6	66	3.2	240	
DEC 17...	1130	1370	696	7.7	14.5	7.6	77	3.7	280	
JAN 14...	1145	1650	753	7.7	11.5	8.4	79	7.8	280	
FEB 18...	1120	1210	737	7.4	16.0	6.3	66	4.2	290	
MAR 18...	1130	869	774	7.5	22.0	6.2	73	2.1	290	
APR 15...	1040	1130	755	7.7	21.5	5.9	69	5.4	290	
MAY 13...	1020	2060	624	7.5	24.0	4.8	58	5.1	220	
JUN 10...	1025	1010	769	7.3	27.0	5.4	68	1.5	300	
JUL 15...	1050	578	883	7.5	28.5	4.7	61	3.3	270	
AUG 19...	1055	293	927	7.3	29.0	5.2	68	2.6	320	
SEP 16...	1115	1180	411	7.4	26.0	4.5	56	3.7	150	
		NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)
OCT 22...	32	53	9.8	20	.7	4.5	172	0	39	
NOV 19...	55	72	15	31	.9	3.7	228	0	53	
DEC 17...	78	84	17	39	1.0	5.0	246	0	77	
JAN 14...	72	82	18	50	1.3	6.6	252	0	72	
FEB 18...	69	85	19	42	1.1	4.1	270	0	74	
MAR 18...	64	85	19	50	1.3	4.2	276	0	70	
APR 15...	75	84	19	50	1.3	4.6	260	0	67	
MAY 13...	58	65	15	41	1.2	5.6	202	0	63	
JUN 10...	83	89	20	49	1.2	3.9	270	0	82	
JUL 15...	42	76	20	68	1.8	5.3	280	0	97	
AUG 19...	90	90	23	66	1.6	5.5	280	0	100	
SEP 16...	35	47	7.9	22	.8	6.5	140	0	40	
		DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)
OCT 22...	25	.4	10	247	.80	.05	.11	1.3	.64	
NOV 19...	42	.3	12	341	2.1	.18	.24	.76	.63	
DEC 17...	58	.3	13	415	2.1	.19	.23	.87	.73	
JAN 14...	69	.4	14	436	3.8	.38	.65	3.6	2.8	
FEB 18...	58	.3	13	429	2.8	.29	.39	.81	1.1	
MAR 18...	67	.3	14	446	3.7	.33	.10	.77	.83	
APR 15...	69	.2	14	436	4.1	.12	.02	1.4	1.0	
MAY 13...	56	.3	11	356	2.2	.34	.09	1.2	1.1	
JUN 10...	62	.4	14	453	3.3	.16	.01	1.8	.72	
JUL 15...	81	.4	16	502	4.7	.25	.23	.87	3.9	
AUG 19...	91	.4	16	530	6.4	.14	.02	.86	1.5	
SEP 16...	36	.2	11	240	2.1	.24	.16	1.3	.79	

## 08183900 CIBOLO CREEK NEAR BOERNE, TX

LOCATION.--Lat 29°46'26", long 98°41'50", Kendall County, Hydrologic Unit 12100304, on left bank 0.6 mi (1.0 km) upstream from Southern Pacific Lines bridge, 0.9 mi (1.4 km) downstream from Menger Creek, and 2.5 mi (4.0 km) southeast of Boerne.

DRAINAGE AREA.--68.4 mi<sup>2</sup> (177.2 km<sup>2</sup>).

PERIOD OF RECORD.--March 1962 to current year.

REVISED RECORDS.--WDR TX-73-1: 1964-65, 1966(P), 1968-72(P).

GAGE.--Water-stage recorder. Datum of gage is 1,339.61 ft (408.313 m) above mean sea level.

REMARKS.--Records good. No known diversion above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--15 years, 29.6 ft<sup>3</sup>/s (0.838 m<sup>3</sup>/s), 5.88 in/yr (149 mm/yr), 21,450 acre-ft/yr (26.4 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,400 ft<sup>3</sup>/s (1,030 m<sup>3</sup>/s) Sept. 27, 1964, gage height, 19.15 ft (5.837 m), from flood-mark, from rating curve extended above 2,500 ft<sup>3</sup>/s (70.8 m<sup>3</sup>/s) on basis of slope-area measurement at 12,000 ft<sup>3</sup>/s (340 m<sup>3</sup>/s) and contracted-opening measurement of 36,400 ft<sup>3</sup>/s (1,030 m<sup>3</sup>/s); no flow at times in 1962-64, 1966-67, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1892, that of Sept. 27, 1964. Second highest flood in 1952 reached a stage of 16.3 ft (4.97 m), discharge 25,600 ft<sup>3</sup>/s (725 m<sup>3</sup>/s), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 450 ft<sup>3</sup>/s (12.7 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)	Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)
Oct. 15	1445	504	14.3	3.73	1.137	Apr. 19	2245	982	27.8	4.45	1.356
Oct. 29	1100	605	17.1	3.91	1.192	June 1	1630	*3,000	85.0	6.24	1.902
Apr. 15	1600	1,710	48.4	5.18	1.579						

Minimum discharge, 2.2 ft<sup>3</sup>/s (0.062 m<sup>3</sup>/s) Sept. 5, 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	110	45	32	57	50	23	77	369	22	6.0	3.1
2	9.2	96	44	32	60	49	25	67	120	22	7.1	3.0
3	8.9	85	43	32	69	57	23	67	66	23	8.3	3.0
4	10	78	42	29	59	56	21	61	52	23	7.1	2.5
5	13	71	63	27	55	47	20	57	46	22	6.3	2.3
6	9.7	68	96	32	53	45	20	53	44	21	6.0	3.3
7	9.0	64	62	26	53	45	20	51	42	21	5.8	4.2
8	9.6	60	57	24	66	42	19	47	40	24	5.9	3.9
9	8.7	57	55	26	58	42	19	45	39	21	5.9	3.7
10	8.1	56	57	22	62	42	18	44	37	23	5.8	3.9
11	7.6	53	128	22	84	40	17	82	34	22	5.5	4.1
12	7.3	51	94	27	64	38	15	51	33	22	5.1	5.7
13	7.4	75	100	104	57	37	17	42	75	19	5.4	6.3
14	7.8	56	212	70	57	38	20	39	39	18	4.7	7.4
15	145	50	142	59	53	38	390	37	33	14	5.0	7.0
16	86	45	104	53	53	36	531	39	30	12	4.6	6.5
17	37	51	95	51	53	36	258	37	28	17	4.8	6.1
18	26	50	93	50	53	34	184	36	26	13	4.4	5.3
19	35	75	97	49	51	33	247	36	25	11	4.9	4.9
20	33	58	78	49	49	32	350	36	24	11	5.2	4.9
21	27	50	69	47	50	32	243	92	24	11	4.7	4.9
22	25	46	65	66	52	30	199	44	25	12	4.8	4.9
23	25	45	61	76	52	30	160	37	58	11	4.3	4.9
24	31	45	56	59	55	32	141	33	81	9.3	4.1	4.6
25	28	67	57	53	54	30	121	30	45	9.3	4.0	3.9
26	24	65	47	53	53	36	107	29	32	8.8	3.2	3.6
27	24	52	44	52	52	59	94	25	27	8.6	3.4	3.1
28	51	48	41	49	50	39	87	18	24	8.6	4.0	2.7
29	336	46	36	45	---	29	82	18	23	8.3	4.3	2.6
30	187	45	36	69	---	25	82	18	22	7.2	3.9	2.7
31	130	---	34	71	---	23	---	22	---	6.0	3.6	---
TOTAL	1376.3	1818	2253	1456	1584	1202	3553	1370	1563	481.1	158.1	129.0
MEAN	44.4	60.6	72.7	47.0	56.6	38.8	118	44.2	52.1	15.5	5.10	4.30
MAX	336	110	212	104	84	59	531	92	369	24	8.3	7.4
MIN	7.3	45	34	22	49	23	15	18	22	6.0	3.2	2.3
CFSM	.65	.89	1.06	.69	.83	.57	1.73	.65	.76	.23	.08	.06
IN.	.75	.99	1.23	.79	.86	.65	1.93	.75	.85	.26	.09	.07
AC-FT	2730	3610	4470	2890	3140	2380	7050	2720	3100	954	314	256
CAL YR 1976	TOTAL	14035.9	MEAN	38.3	MAX	1410	MIN	2.5	CFSM	.56	IN	7.63
WTR YR 1977	TOTAL	16943.5	MEAN	46.4	MAX	531	MIN	2.3	CFSM	.68	IN	9.21
									AC-FT	27840	AC-FT	33610

## GUADALUPE RIVER BASIN

08185000 CIBOLO CREEK AT SELMA, TX

LOCATION.--Lat 29°35'38", long 98°18'39", Bexar-Guadalupe County line, Hydrologic Unit 12100304, on right bank 0.6 mi (1.0 km) downstream from Missouri-Kansas-Texas Railroad Co. bridge and 0.9 mi (1.4 km) upstream from bridge on Interstate Highway 35 at Selma.

DRAINAGE AREA.--274 mi<sup>2</sup> (710 km<sup>2</sup>).

PERIOD OF RECORD.--March 1946 to current year. Figures for water year 1960 in WSP 1813 are in error and should be disregarded.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 728.34 ft (221.998 m) above mean sea level.

REMARKS.--Records good. Small diversion above station. Considerable flow of Cibolo Creek enters the Edwards and associated limestones in the Balcones Fault Zone which crosses basin between this station and the one near Boerne (station 08183900). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--31 years, 15.6 ft<sup>3</sup>/s (0.442 m<sup>3</sup>/s), 11,300 acre-ft/yr (13.9 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 65,000 ft<sup>3</sup>/s (1,840 m<sup>3</sup>/s) July 16, 1973, gage height, 26.2 ft (7.99 m), from flood-mark, from rating curve extended above 16,000 ft<sup>3</sup>/s (453 m<sup>3</sup>/s) on basis of field estimate of 54,000 ft<sup>3</sup>/s (1,530 m<sup>3</sup>/s) and contracted-opening measurement of 65,000 ft<sup>3</sup>/s (1,840 m<sup>3</sup>/s); no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1869, that of July 16, 1973. A stage of 26 ft (7.9 m) occurred in 1889, and stage of flood in 1913 is unknown, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 200 ft<sup>3</sup>/s (5.66 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)	Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)
Oct. 24	1200	*9,370	265	11.55	3.520	Apr. 17	0800	577	16.3	4.98	1.518
Oct. 30	0600	831	23.5	5.41	1.649	Apr. 20	1000	1,960	55.5	6.88	2.097

Minimum discharge, no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	184	.02	.00	.00	.00	.00	5.5	.00	.00	.00	.00
2	.00	115	.01	.00	.00	.00	.00	1.1	.00	.00	.00	.00
3	.00	71	.01	.00	.00	.00	.00	.32	.00	.00	.00	.00
4	.00	40	.00	.00	.00	.00	.00	.18	.00	.00	.00	.00
5	.00	16	.01	.00	.00	.00	.00	.11	.00	.00	.00	.00
6	.00	3.8	.03	.00	.00	.00	.00	.08	.00	.00	.00	.00
7	.00	.75	.03	.00	.00	.00	.00	.07	.00	.00	.00	.00
8	.00	.35	.02	.00	.00	.00	.00	.06	.00	.00	.00	.00
9	.00	.57	.01	.00	.00	.00	.00	.06	.00	.00	.00	.00
10	.00	.28	.01	.00	.00	.00	.00	.07	.00	.00	.00	.00
11	.00	.15	.00	.00	.00	.00	.00	.11	.00	.00	.00	.00
12	.00	.12	.00	.00	.00	.00	.00	.07	.00	.00	.00	.00
13	.00	.11	.00	.00	.00	.00	.00	.07	.00	.00	.00	.00
14	.00	.10	.00	.00	.00	.00	.00	.06	.00	.00	.00	.00
15	.00	.10	.00	.00	.00	.00	.00	.04	.00	.00	.00	.00
16	.00	.10	.00	.00	.00	.00	24	.02	.00	.00	.00	.00
17	.00	.11	.00	.00	.00	.00	254	.01	.00	.00	.00	.00
18	.00	.09	.00	.00	.00	.00	103	.00	.00	.00	.00	.00
19	.00	.15	.00	.00	.00	.00	42	.00	.00	.00	.00	.00
20	.00	.13	.00	.00	.00	.00	896	.00	.00	.00	.00	.00
21	.00	.10	.00	.00	.00	.00	561	.00	.00	.00	.00	.00
22	.00	.10	.00	.00	.00	.00	278	.00	.00	.00	.00	.00
23	.00	.10	.00	.00	.00	.00	200	.00	.00	.00	.00	.00
24	1720	.08	.00	.00	.00	.00	140	.00	.00	.00	.00	.00
25	297	.09	.00	.00	.00	.00	102	.00	.00	.00	.00	.00
26	80	.07	.00	.00	.00	.00	72	.00	.00	.00	.00	.00
27	27	.04	.00	.00	.00	.00	51	.00	.00	.00	.00	.00
28	6.9	.03	.00	.00	.00	.00	34	.00	.00	.00	.00	.00
29	265	.03	.00	.00	.00	.00	20	.00	.00	.00	.00	.00
30	601	.02	.00	.00	.00	.00	11	.00	.00	.00	.00	.00
31	306	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	3302.90	433.57	.15	.00	.00	.00	2788.00	7.93	.00	.00	.00	.00
MEAN	107	14.5	.005	.000	.000	.000	92.9	.26	.000	.000	.000	.000
MAX	1720	184	.03	.00	.00	.00	896	5.5	.00	.00	.00	.00
MIN	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	6550	860	.3	.00	.00	.00	5530	16	.00	.00	.00	.00
CAL YR 1976	TOTAL	6578.22	MEAN	18.0	MAX	1720	MIN	.00	AC-FT	13050		
WTR YR 1977	TOTAL	6532.55	MEAN	17.9	MAX	1720	MIN	.00	AC-FT	12960		

## 08186000 CIBOLO CREEK NEAR FALLS CITY, TX

LOCATION.--Lat 29°00'50", long 97°55'48", Karnes County, Hydrologic Unit 12100304, on right bank at downstream side of pier of bridge on State Highway 123, 5.7 mi (9.2 km) northeast of Falls City, and 10.4 mi (16.7 km) upstream from mouth.

DRAINAGE AREA.--827 mi<sup>2</sup> (2,142 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1930 to current year. Monthly discharge only for some periods, published in WSP 1312.

REVISED RECORDS.--WSP 733: 1931. WSP 1058: 1935. WSP 1562: 1931(M), 1933. WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 264.28 ft (80.553 m) above mean sea level. Nov. 4, 1930, to Aug. 4, 1940, water-stage recorder at site 1,600 ft (488 m) upstream at datum 0.56 ft (0.171 m) higher. Aug. 5 to Sept. 13, 1940, nonrecording gage at present site and datum.

REMARKS.--Water-discharge records good. Diversions for irrigation above station. Much of the base flow is effluent from the Carrizo Sands in the vicinity of Sutherland Springs.

AVERAGE DISCHARGE.--47 years, 124 ft<sup>3</sup>/s (3.512 m<sup>3</sup>/s), 89,840 acre-ft/yr (111 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,600 ft<sup>3</sup>/s (952 m<sup>3</sup>/s) July 6, 1942, gage height, 34.45 ft (10.500 m); maximum gage height, 35.44 ft (10.802 m) Sept. 28, 1973; no flow July 30, 31, Aug. 4-22, 1956, Aug. 1, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1890, that of Sept. 28, 1973. In October 1913, a stage of 35 ft (10.7 m) occurred, discharge about 35,000 ft<sup>3</sup>/s (991 m<sup>3</sup>/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,600 ft<sup>3</sup>/s (102 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 30	1900	7,230	205	Apr. 21	1500	*24,000	680
Apr. 16	1600	7,040	199	Sept. 14	0600	7,560	214
							21.47
							6.544

Minimum discharge, 26 ft<sup>3</sup>/s (0.74 m<sup>3</sup>/s) Sept. 5, 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	733	135	86	611	90	61	272	97	61	38	30
2	57	543	124	85	249	90	60	244	92	60	37	30
3	46	362	115	85	191	92	61	217	91	58	36	30
4	39	291	108	88	227	92	60	195	90	57	35	28
5	79	255	845	98	181	95	60	179	90	57	35	26
6	173	218	1240	100	144	99	57	167	86	56	36	27
7	129	196	649	97	127	91	56	156	85	54	35	31
8	90	169	285	94	116	87	55	148	82	52	35	37
9	65	154	188	93	110	84	54	143	80	50	35	32
10	51	138	160	92	112	84	52	410	78	48	34	32
11	43	129	148	94	428	83	51	1360	77	48	34	32
12	39	120	141	134	1570	81	52	225	76	48	32	30
13	37	116	162	217	539	81	55	194	80	48	30	1240
14	36	115	428	481	295	79	75	148	83	48	31	4640
15	35	122	620	433	217	78	312	127	77	48	29	212
16	567	123	297	207	176	77	4720	122	74	47	30	107
17	1350	116	184	152	151	73	4760	120	73	47	31	81
18	252	212	148	130	137	72	1650	118	72	48	31	68
19	142	244	145	114	127	71	513	113	68	48	30	60
20	555	1020	173	104	119	66	2930	110	67	49	31	55
21	526	452	146	96	113	65	19800	413	67	48	30	52
22	226	265	133	130	109	63	5030	1280	68	47	30	49
23	149	191	115	400	106	62	943	727	78	44	28	47
24	430	160	106	1080	103	63	705	263	75	42	28	46
25	2250	337	103	398	101	62	669	227	77	42	28	44
26	1880	1960	140	217	96	63	529	168	83	40	28	44
27	384	547	124	167	92	66	445	125	77	40	28	43
28	232	248	113	146	91	70	354	112	72	39	28	41
29	2000	170	100	132	---	73	297	106	67	39	29	41
30	5100	147	94	119	---	73	296	103	64	42	28	40
31	2390	---	89	354	---	68	---	101	---	40	29	---
TOTAL	19422	9853	7558	6223	6638	2393	44762	8393	2346	1495	979	7275
MEAN	627	328	244	201	237	77.2	1492	271	78.2	48.2	31.6	243
MAX	5100	1960	1240	1080	1570	99	19800	1360	97	61	38	4640
MIN	35	115	89	85	91	62	51	101	64	39	28	26
AC-FT	38520	19540	14990	12340	13170	4750	88790	16650	4650	2970	1940	14430
CAL YR 1976	TOTAL	77553	MEAN	212	MAX	5100	MIN	18	AC-FT	153800		
WTR YR 1977	TOTAL	117337	MEAN	321	MAX	19800	MIN	26	AC-FT	232700		

## GUADALUPE RIVER BASIN

08186000 CIBOLO CREEK NEAR FALLS CITY, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1968 to current year. Chemical and biochemical analyses: October 1969 to current year. Sediment records: October 1968 to September 1969.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1968 to current year.

WATER TEMPERATURES: October 1968 to current year.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,270 micromhos May 20, 21, 1971; minimum daily, 176 micromhos Sept. 28, 1973.

WATER TEMPERATURES: Maximum daily, 33.0°C on several days during August 1969; minimum daily, 4.5°C Jan. 7, 1970.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,490 micromhos Sept. 27, 28, 30; minimum daily, 193 micromhos Apr. 21.

WATER TEMPERATURES: Maximum daily, 31.0°C Sept. 15; minimum daily, 10.5°C Dec. 7, 19.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA, MG)
OCT									
22...	0945	230	372	7.4	14.5	9.0	91	2.6	130
NOV									
19...	1140	180	942	7.9	12.0	7.8	75	1.2	340
DEC									
17...	1030	160	799	7.7	13.0	9.7	95	1.6	270
JAN									
14...	1100	390	901	7.9	10.0	10.2	94	2.8	290
FEB									
18...	1035	110	1010	7.6	15.0	9.1	93	.9	340
MAR									
18...	1050	60	1350	7.6	21.0	8.1	93	1.3	430
APR									
15...	1000	170	1320	7.7	21.0	7.2	83	3.8	--
MAY									
13...	0940	180	609	7.1	23.5	7.0	84	2.6	210
JUN									
10...	0930	70	1350	7.8	27.0	6.8	86	.9	--
JUL									
15...	1015	45	1330	7.8	27.0	6.9	87	1.6	--
AUG									
19...	1010	29	1400	7.6	28.0	6.5	83	1.0	--
SEP									
16...	1015	100	637	7.4	26.0	6.4	80	2.4	190

DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)
OCT									
22...	30	44	4.9	24	.9	6.8	122	0	46
NOV									
19...	100	110	16	85	2.0	5.1	288	0	110
DEC									
17...	100	88	11	68	1.8	8.0	200	0	110
JAN									
14...	100	91	14	74	1.9	7.0	225	0	120
FEB									
18...	130	110	17	85	2.0	6.3	262	0	150
MAR									
18...	160	130	25	130	2.7	5.7	330	0	230
APR									
15...	--	--	--	--	--	--	--	--	--
MAY									
13...	77	68	9.4	44	1.3	6.5	160	0	97
JUN									
10...	--	--	--	--	--	--	--	--	--
JUL									
15...	--	--	--	--	--	--	--	--	--
AUG									
19...	--	--	--	--	--	--	--	--	--
SEP									
16...	80	63	9.0	50	1.6	6.6	140	0	110

## GUADALUPE RIVER BASIN

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08186000 CIBOLO CREEK NEAR FALLS CITY, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)
OCT									
22...	29	.3	14	229	.65	.01	.04	.96	.41
NOV									
19...	97	.3	14	579	2.8	.01	.04	.77	.27
DEC									
17...	92	.3	16	492	1.2	.01	.05	.79	.25
JAN									
14...	100	.3	11	528	2.6	.01	.09	1.2	.29
FEB									
18...	110	.3	16	624	2.0	.01	.04	.52	.19
MAR									
18...	160	.3	10	854	2.9	.04	.09	.62	.10
APR									
15...	--	--	--	--	2.2	.02	.07	1.3	.27
MAY									
13...	54	.2	13	371	.69	.03	.10	1.0	.25
JUN									
10...	--	--	--	--	3.2	.01	.05	1.9	.13
JUL									
15...	--	--	--	--	2.7	.02	.00	.09	.09
AUG									
19...	--	--	--	--	1.7	.02	.01	.83	.10
SEP									
16...	54	.2	11	373	.63	.02	.08	.69	.22

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	19422	356	210	10900	24	1240	38	2010	130
NOV. 1976.....	9853	663	400	10700	64	1710	97	2580	230
DEC. 1976.....	7558	855	530	10800	90	1840	130	2680	290
JAN. 1977.....	6223	989	620	10400	110	1810	150	2560	330
FEB. 1977.....	6638	791	480	8660	82	1460	120	2200	270
MAR. 1977.....	2393	1310	830	5380	150	989	220	1420	430
APR. 1977.....	44762	361	210	25200	26	3160	43	5210	130
MAY 1977.....	8393	799	490	11100	83	1880	120	2750	270
JUNE 1977.....	2346	1310	830	5270	150	974	220	1390	430
JULY 1977.....	1495	1350	860	3480	160	646	230	928	450
AUG. 1977.....	979	1300	820	2180	150	400	220	571	430
SEPT 1977.....	7275	478	290	5680	40	791	58	1150	170
TOTAL .....	117337	**	**	110000	**	16900	**	25400	**
WTD.AVG. ....	321.47	572	350	**	53	**	80	**	200



## GUADALUPE RIVER BASIN

08186000 CIBOLO CREEK NEAR FALLS CITY, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	900	390	1020	925	576	1260	1420	1000	1320	1290	1370	1360
2	862	440	1150	1000	898	1240	1370	1040	1280	1330	1340	1320
3	622	544	1170	1160	815	1210	1400	1030	1300	1330	1300	1470
4	679	738	1200	1170	809	1190	1370	1080	1310	1350	1230	1410
5	926	1030	846	1390	1070	1250	1300	1120	1290	1360	1370	1330
6	878	1010	381	1310	990	1230	1290	1190	1240	1200	1340	1350
7	918	1030	650	1320	905	1240	1280	1140	1320	1370	1280	1320
8	830	1090	1070	1320	1140	1230	1400	1090	1130	1390	1400	1360
9	649	992	1040	1330	1140	1220	1410	1000	1340	1340	1340	1280
10	424	1020	1080	1300	1200	1270	1400	729	1360	1370	1450	1290
11	982	734	1080	1320	688	1370	1410	279	1360	1360	1070	1270
12	896	1070	1090	1110	470	1280	1360	570	1260	1270	1350	1260
13	974	679	978	1080	550	1220	1050	734	1350	1370	1330	326
14	589	890	646	901	762	1360	1380	1260	1340	1340	1430	250
15	732	1080	879	1140	771	1350	1060	1240	1350	1350	1470	1160
16	448	1070	743	1000	914	1340	526	1290	1340	1370	1320	1380
17	407	1070	914	1120	1030	1360	425	1020	1350	1340	1280	1420
18	467	1060	966	1160	974	1370	416	1130	1360	1370	1180	1450
19	361	1050	1000	1180	1180	1340	503	739	1370	1380	1180	1380
20	448	682	859	793	1230	1370	313	946	1360	1390	1270	1370
21	460	342	1010	614	1260	1350	193	545	1330	1380	1360	1440
22	509	715	1160	650	1250	1360	370	756	1300	1380	1320	1480
23	600	803	1240	703	1270	1360	468	861	1310	1390	1280	1480
24	520	644	1150	1000	1290	1370	506	559	1290	1340	1230	1480
25	292	575	1060	791	1240	1380	649	725	1350	1390	1300	1480
26	413	310	1140	885	1240	1350	700	540	1360	1340	1350	1480
27	371	858	1210	892	1270	1360	591	1160	1300	1380	1070	1490
28	560	601	1280	892	1230	1330	839	1290	1280	1350	1250	1490
29	209	1210	1330	961	---	1410	850	1280	1160	1360	1310	1480
30	254	1300	1360	935	---	1440	872	1290	1200	1380	1080	1490
31	317	---	1390	903	---	1420	---	1260	---	1400	1240	---
MEAN	611	837	1040	1040	1010	1320	937	977	1310	1360	1290	1320

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	19.5	15.0	12.0	15.0	13.5	16.5	23.0	28.0	28.5	---	28.5
2	26.0	21.0	13.5	13.0	14.0	14.5	19.0	18.5	28.5	28.0	28.0	28.0
3	25.5	19.0	12.0	14.5	15.5	---	18.5	20.0	---	28.0	29.5	29.5
4	26.0	18.5	11.5	13.5	13.0	16.0	16.5	21.5	29.0	---	29.0	---
5	28.0	18.0	11.5	11.0	13.5	15.5	18.0	22.0	---	28.0	28.5	28.5
6	25.0	19.0	14.0	14.5	---	16.5	---	24.0	27.0	29.5	29.5	28.0
7	26.5	19.5	10.5	---	14.5	---	18.5	23.5	26.5	29.0	29.5	29.5
8	24.5	17.0	12.0	15.0	13.0	15.5	17.0	---	28.0	28.5	30.0	29.0
9	25.0	16.0	14.0	15.5	13.0	14.0	16.5	23.0	28.0	28.0	29.5	28.5
10	25.5	18.0	14.5	13.5	14.0	15.5	---	21.0	29.0	---	29.0	---
11	26.0	17.0	13.0	15.0	12.0	16.5	16.0	22.0	28.5	28.5	29.5	---
12	24.5	18.0	---	16.5	13.5	15.5	18.0	24.0	28.5	28.0	28.5	29.5
13	25.0	16.0	18.0	16.0	---	16.5	18.5	23.5	29.0	---	29.5	28.0
14	25.0	---	19.0	---	13.5	15.0	16.5	22.0	28.5	28.0	28.5	29.5
15	25.5	16.5	18.0	15.5	12.0	---	15.5	24.5	28.0	27.0	28.5	31.0
16	24.5	17.0	16.0	16.5	14.5	18.0	14.5	24.0	28.0	28.5	29.5	29.5
17	24.5	14.5	14.5	13.0	13.5	16.5	---	26.5	---	28.5	29.0	29.0
18	25.0	---	16.0	13.0	14.0	18.0	18.0	23.0	28.5	28.0	28.5	---
19	23.5	15.0	10.5	15.0	13.5	18.0	21.0	25.0	---	28.0	29.0	28.0
20	25.5	16.5	11.0	16.5	---	18.5	20.0	24.5	28.5	29.0	---	29.0
21	24.0	16.5	13.5	14.0	14.5	15.5	21.5	26.0	---	29.5	29.0	30.0
22	24.5	17.0	12.0	16.5	15.5	14.0	22.0	25.5	28.0	29.0	---	29.5
23	23.5	15.5	13.5	16.5	---	16.5	21.5	26.0	29.0	28.5	28.5	29.0
24	---	14.0	---	14.0	14.0	---	21.5	24.5	28.0	28.5	29.0	28.5
25	24.0	---	14.0	15.5	15.5	18.0	21.0	25.5	28.0	29.5	28.5	29.5
26	25.5	15.5	---	17.0	14.5	17.0	19.0	---	28.0	28.5	29.0	29.0
27	20.5	16.0	13.0	15.0	15.0	18.5	19.5	27.0	28.0	29.0	29.5	29.5
28	---	15.5	12.0	16.5	16.5	---	18.5	28.5	26.5	28.5	28.0	30.0
29	15.5	14.0	13.0	17.0	---	19.0	---	---	29.0	29.0	29.0	28.5
30	18.0	---	13.0	---	---	18.5	22.0	25.5	---	29.5	28.5	30.0
31	20.0	---	11.5	14.5	---	18.0	---	26.0	---	28.5	---	---
MEAN	24.0	17.0	13.5	15.0	14.0	16.5	18.5	24.0	28.0	28.5	29.0	29.0

## 08186500 ECLETO CREEK NEAR RUNGE, TX

LOCATION.--Lat 28°55'12", long 97°46'19", Karnes County, Hydrologic Unit 12100303, on left bank 55 ft (17 m) downstream from Farm Road 81, 215 ft (66 m) left of left end of bridge, 2.6 mi (4.2 km) upstream from Salt Branch, 4.5 mi (7.2 km) northwest of Runge, and 5.2 mi (8.4 km) upstream from mouth.

DRAINAGE AREA.--239 mi<sup>2</sup> (619 km<sup>2</sup>).

PERIOD OF RECORD.--March 1962 to current year.

Water-quality records: Sediment records: February 1966 to September 1975.

GAGE.--Water-stage recorder. Datum of gage is 215.03 ft (65.541 m) above mean sea level.

REMARKS.--Records good. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--15 years, 39.2 ft<sup>3</sup>/s (1.110 m<sup>3</sup>/s), 2.23 in/yr (57 mm/yr), 28,400 acre-ft/yr (35.0 hm<sup>3</sup>/s).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 58,400 ft<sup>3</sup>/s (1,650 m<sup>3</sup>/s) Sept. 22, 1967, gage height, 33.3 ft (10.15 m), from flood-mark, from rating curve extended above 7,300 ft<sup>3</sup>/s (207 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow at times 1962-67, 1969-72, 1974, and 1976.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood information begins with the flood in June 1903 which reached a stage of 34 ft (10.4 m), discharge 71,000 ft<sup>3</sup>/s (2,010 m<sup>3</sup>/s). A stage of 32 ft (9.8 m), discharge 39,000 ft<sup>3</sup>/s (1,100 m<sup>3</sup>/s) occurred in September 1952, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft<sup>3</sup>/s (14.2 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 16	0630	862	24.4	8.85	2.697	Dec. 20	0300	2,140	60.6	13.68	4.170
Oct. 25	1430	616	17.4	7.53	2.295	Feb. 12	0400	593	16.8	7.40	2.256
Oct. 30	0900	2,000	56.6	13.27	4.045	Apr. 17	0730	a4,490	127	20.92	6.376
Nov. 26	1700	1,370	38.8	11.09	3.380	Apr. 20	1900	a4,610	131	19.49	5.941
Dec. 7	0430	2,120	60.0	13.64	4.157	May 22	0800	2,430	68.8	14.52	4.426
Dec. 14	1330	693	19.6	7.96	2.426	Sept. 14	0130	675	19.1	7.86	2.396

a Backwater from San Antonio River.

Minimum discharge, 0.06 ft<sup>3</sup>/s (0.002 m<sup>3</sup>/s) Aug. 25-27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	86	43	13	12	7.1	4.5	155	13	2.9	.80	.24
2	4.7	44	30	13	31	7.1	4.5	67	12	2.5	.80	.42
3	2.6	27	20	12	33	7.1	4.5	44	11	2.5	.69	.20
4	1.6	17	16	12	23	7.1	4.1	31	9.8	2.4	.69	.10
5	23	12	21	11	19	6.8	3.3	23	9.1	2.2	.69	.08
6	11	9.0	722	11	20	6.8	2.8	19	8.4	2.0	.69	.20
7	6.8	7.2	1580	11	15	6.8	2.5	17	7.4	2.0	.50	.69
8	6.1	6.2	222	10	11	7.1	2.5	16	7.0	1.9	.50	.80
9	3.1	5.4	74	10	9.5	7.1	2.5	14	6.8	1.9	.42	.29
10	1.8	5.0	48	9.2	9.8	7.1	2.5	13	6.5	1.6	.42	.20
11	1.2	4.7	36	9.2	229	7.1	2.4	109	6.0	1.4	.42	.16
12	.73	4.5	30	12	515	6.7	2.3	45	6.4	1.4	.42	.23
13	.56	4.5	26	52	262	6.2	2.3	34	7.7	1.4	.42	.39
14	.37	4.4	401	106	80	6.0	5.2	34	9.4	1.6	.35	210
15	5.7	4.1	347	96	46	6.0	21	28	9.4	1.7	.35	284
16	380	3.8	152	57	30	6.0	3040	26	14	1.6	.35	81
17	49	4.0	65	33	21	6.0	4240	24	6.1	1.7	.24	22
18	9.3	4.2	42	21	17	6.0	1630	23	4.9	1.7	.20	9.1
19	3.7	9.3	363	15	14	5.9	128	22	4.1	1.7	.20	4.7
20	5.9	41	1100	12	12	5.4	2320	21	3.8	1.9	.24	2.5
21	20	40	130	9.7	11	4.7	1790	228	3.9	1.7	.20	1.5
22	8.7	28	68	17	11	4.5	1100	1950	3.8	1.7	.16	.96
23	5.0	15	46	188	10	4.5	305	695	4.5	1.6	.10	.67
24	44	8.7	34	265	9.2	4.8	97	122	5.5	1.3	.10	.57
25	501	87	29	132	8.8	5.2	51	66	5.0	1.2	.10	.39
26	215	1130	32	61	8.8	5.2	38	43	4.2	1.2	.06	.23
27	47	1130	43	38	8.3	5.2	31	30	4.0	1.2	.06	.19
28	25	380	32	26	7.4	5.0	26	23	3.5	1.2	.16	.15
29	905	112	23	18	---	4.7	23	20	3.3	1.2	.20	.13
30	1820	66	18	15	---	4.7	80	17	3.1	1.0	.16	.09
31	553	---	15	13	---	4.5	---	15	---	.91	.16	---
TOTAL	4671.86	3300.0	5808	1308.1	1483.8	184.4	14965.9	3974	203.6	52.21	10.85	660.79
MEAN	151	110	187	42.2	53.0	5.95	499	128	6.79	1.68	.35	22.0
MAX	1820	1130	1580	265	515	7.1	4240	1950	14	2.9	.80	284
MIN	.37	3.8	15	9.2	7.4	4.5	2.3	13	3.1	.91	.06	.08
CFSM	.63	.46	.78	.18	.22	.03	2.09	.54	.03	.007	.001	.09
IN.	.73	.51	.90	.20	.23	.03	2.33	.62	.03	.01	.00	.10
AC-FT	9270	6550	11520	2590	2940	366	29680	7880	404	104	22	1310
CAL YR 1976	TOTAL	21705.16	MEAN	59.3	MAX	1820	MIN	.00	CFSM	.25	IN	3.38
WTR YR 1977	TOTAL	36623.51	MEAN	100	MAX	4240	MIN	.06	CFSM	.42	IN	5.70
									AC-FT	43050	AC-FT	72640

## GUADALUPE RIVER BASIN

08187900 ESCONDIDO CREEK SUBWATERSHED NO. 11 (DRY ESCONDIDO CREEK) NEAR KENEDY, TX

LOCATION.--Lat 28°51'39", long 97°50'39", Karnes County, Hydrologic Unit 12100303, near center of dam on Dry Escondido Creek, 0.5 mi (0.8 km) upstream from bridge on Farm Road 792, 3 mi (5 km) north of Kenedy, and 5.0 mi (8.0 km) upstream from Escondido Creek.

DRAINAGE AREA.--8.43 mi<sup>2</sup> (21.83 km<sup>2</sup>).

PERIOD OF RECORD.--January to August 1958 (outflow, annual maximum only; inflow, peaks above base only), September 1958 to September 1977 (discontinued).

REVISED RECORDS.--WSP 1923: 1958-60.

GAGE.--Water-stage recorder with concrete drop-inlet control. Datum of gage is 285.12 ft (86.905 m) above mean sea level.

REMARKS.--Records good. The dam was completed Jan. 31, 1958, but the lower drain valve in the drop-inlet structure remained open until Sept. 15, 1958. The first outflow (since lower drain valve was closed) occurred Sept. 22, 1958. The pool is formed by a rolled earthfill dam about 2,600 ft (792 m) long with spillways at both the left and right end of the dam. The outlet structure is a 36-inch (914 mm) square concrete box drop inlet connected to a 28-inch (711 mm) concrete outlet pipe. Four 10-inch (254 mm) square portholes are set in the sides of the drop inlet, two on the upstream side and two on the downstream side. Bottom of portholes are at gage height 15.67 ft (4.776 m). The top of the drop inlet is at gage height 18.00 ft (5.486 m). The two spillways (both left and right) are at gage height 32.8 ft (10.00 m). The lower drain valve is an 8-inch-diameter (203 mm) cleanout gate at the bottom of the drop-inlet structure at a gage height of 9.4 ft (2.87 m). The pool capacity is 2,670 acre-ft (3.29 hm<sup>3</sup>) at the spillway crests, 236 acre-ft (0.291 hm<sup>3</sup>) at top of the drop inlet, 140 acre-ft (0.173 hm<sup>3</sup>) at the bottom of portholes, and 29.9 acre-ft (0.037 hm<sup>3</sup>) at the 8-inch (203 mm) controlled outlet. The dam was built by the Soil Conservation Service for flood control. The capacity table is based on a survey made Sept. 11, 1965. Rainfall records are collected from a recording rain gage at station.

AVERAGE INFLOW.--19 years, 852 acre-ft/yr (1.051 hm<sup>3</sup>/yr).

AVERAGE OUTFLOW.--19 years, 728 acre-ft/yr (0.898 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum inflow, 18,000 ft<sup>3</sup>/s (510 m<sup>3</sup>/s), average for 5-minute interval, Sept. 21, 1967, computed from change in pool contents and adjusted for outflow and rainfall on pool surface; no inflow at times. Maximum outflow, 8,030 ft<sup>3</sup>/s (227 m<sup>3</sup>/s) Sept. 27, 1967, gage height, 36.36 ft (11.083 m), from floodmark at gage; 36.3 ft (11.06 m), from floodmarks at spillways, from rating curve extended above 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) on basis of flow-over-spillway measurement (includes two spillways) of 7,900 ft<sup>3</sup>/s (224 m<sup>3</sup>/s) plus flow through the drop inlet; no outflow most of time each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)		Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	
Dec. 19	1615	350	9.91	May 11	1600	136	3.85
Apr. 16	0805	*1,640	46.4	May 21	2315	170	4.81
Apr. 20	1235	465	13.2				

NOTE.--Average for 5-minute interval. Inflow computed and adjusted as explained above.

Minimum discharge, no inflow for many days. Maximum outflow, 86.1 ft<sup>3</sup>/s (2.44 m<sup>3</sup>/s), gage height, 22.27 ft (6.788 m) Apr. 16; no outflow at times.

## POOL WATER BUDGET, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
Inflow 1/	147	45.0	226	32.5	22.1	4.4	760	252	12.0	1.3	2.9	10.2
Outflow	95.5	43.4	228	23.4	13.5	0	715	272	.6	0	0	0
(+)	+42.3	-7.7	-8.4	-1.2	-4.4	-11.4	+48.0	-30.4	-7.4	-19.2	-15.5	-2.2
(++)	5.84	2.94	3.64	1.94	1.43	.34	9.45	5.00	1.80	.42	.10	2.59

CAL YR 1976: Inflow 539      Outflow 367      + +66.5      ++ 36.48  
WTR YR 1977: Inflow 1,520      Outflow 1,390      + -17.4      ++ 35.49

1/ Inflow adjusted for rainfall on pool and pool losses.

+ Change in contents, in acre-feet.

++ Rainfall, in inches.

08188500 SAN ANTONIO RIVER AT GOLIAD, TX  
(National stream-quality accounting network)

LOCATION.--Lat 28°38'58", long 97°23'04", Goliad County, Hydrologic Unit 12100303, on right bank at upstream side of bridge on U.S. Highway 183, 1.2 mi (1.9 km) southeast of courthouse in Goliad, 11.7 mi (18.8 km) upstream from Manahuilla Creek, and 66.5 mi (107.0 km) upstream from mouth.

DRAINAGE AREA.--3,921 mi<sup>2</sup> (10,155 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1924 to March 1929, February 1939 to current year.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 91.08 ft (27.761 m) above mean sea level. Prior to Mar. 31, 1929, nonrecording gage at Texas and New Orleans Railroad Co. bridge 0.9 mi (1.4 km) upstream at same datum.

REMARKS.--Water-discharge records good. Many diversions and regulations above station (see station 08181800). Flow is affected at times by discharge from flood-detention pools of 30 floodwater-retarding structures with combined detention capacity of 50,820 acre-ft (62.7 hm<sup>3</sup>). These structures control runoff from 159 mi<sup>2</sup> (412 km<sup>2</sup>).

AVERAGE DISCHARGE.--42 years (water years 1925-28, 1940-77), 648 ft<sup>3</sup>/s (18.35 m<sup>3</sup>/s), 469,500 acre-ft/yr (579 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 138,000 ft<sup>3</sup>/s (3,910 m<sup>3</sup>/s) Sept. 23, 1967, gage height, 53.7 ft (16.37 m), from floodmark, from rating curve extended above 26,000 ft<sup>3</sup>/s (736 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; minimum observed, 1.2 ft<sup>3</sup>/s (0.034 m<sup>3</sup>/s) June 16, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1869, that of Sept. 23, 1967. Flood of July 9, 1942, reached a stage of 44.9 ft (13.69 m); floods in October 1913 and June 15, 1935, reached about the same stage. Maximum stage since about 1800 occurred in 1869 and was several feet higher than flood of Sept. 23, 1967.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,000 ft<sup>3</sup>/s (85.0 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 17	0700	3,180	90.1	Feb. 13	2100	3,420	96.9
Oct. 27	1300	4,480	127	Apr. 19	2200	12,200	346
Nov. 2	0200	7,430	210	Apr. 25	0100	*15,900	450
Nov. 28	0100	5,400	153	May 12	2100	5,630	159
Dec. 7	1900	4,260	121	May 23	2300	6,150	174
Dec. 21	0100	4,580	130	June 15	1600	7,280	206
Jan. 25	2400	3,080	87.2	Sept. 15	2400	4,350	123

a From floodmark.

Minimum discharge, 373 ft<sup>3</sup>/s (10.6 m<sup>3</sup>/s) Aug. 28, 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1590	7180	1440	1250	1290	1120	934	2500	1420	936	565	439
2	1130	7240	1310	1230	2170	1110	916	2400	1390	902	591	456
3	822	5850	1220	1210	2140	1120	898	2130	1360	871	566	452
4	731	3110	1160	1190	1680	1090	877	1960	1410	859	537	440
5	775	2280	1160	1200	1520	1070	858	1860	1400	853	520	434
6	1200	2040	1500	1210	1490	1090	846	1770	1310	833	506	430
7	1310	1860	3810	1190	1400	1140	887	1710	1300	807	513	426
8	1800	1720	3720	1170	1310	1110	862	1670	1250	767	514	422
9	1310	1610	2300	1160	1260	1080	820	1620	1200	713	504	448
10	853	1510	1570	1150	1290	1070	801	1570	1150	687	495	579
11	746	1450	1340	1120	1410	1050	784	1800	1280	667	489	519
12	686	1390	1330	1140	1980	1040	769	5020	1240	645	492	502
13	634	1350	1280	1280	3070	1020	766	4710	1060	623	493	498
14	615	1310	1460	1600	2790	1010	762	2780	1030	609	486	640
15	610	1290	2510	1930	1860	991	906	2260	4440	641	486	3200
16	1580	1350	2710	2200	1510	975	1760	2250	2710	686	485	3480
17	2820	1290	2090	1800	1410	972	6530	2280	1150	680	472	2190
18	2560	1240	1690	1460	1360	972	9480	2090	1010	646	466	1060
19	2320	1350	1620	1290	1330	963	11800	1920	960	642	435	778
20	1380	1650	3120	1200	1310	945	10400	1800	922	640	419	705
21	1250	1910	3570	1160	1300	938	6720	1740	884	638	408	666
22	2160	2590	1910	1160	1260	919	8310	2560	845	642	448	640
23	1890	2050	1660	1250	1210	900	11300	5610	841	633	428	632
24	1260	1520	1530	1760	1200	894	14800	5600	862	626	398	598
25	1540	1350	1460	2720	1190	887	15200	3410	987	619	387	521
26	3590	1560	1510	2780	1170	874	10700	2330	1070	605	386	552
27	4280	4210	1460	1960	1140	876	3860	1930	1170	590	379	563
28	2540	4590	1460	1520	1130	878	2580	1730	1040	580	376	557
29	2490	2500	1390	1390	---	893	2340	1600	1020	586	377	528
30	4360	1750	1330	1310	---	938	2250	1520	985	550	411	484
31	6420	---	1290	2260	---	950	---	1460	---	540	424	---
TOTAL	57252	72100	56910	45250	43180	30885	130716	75590	38696	21316	14456	23839
MEAN	1847	2403	1836	1460	1542	996	4357	2438	1290	688	466	795
MAX	6420	7240	3810	2780	3070	1140	15200	5610	4440	936	591	3480
MIN	610	1240	1160	1120	1130	874	762	1460	841	540	376	422
AC-FT	113600	143000	112900	89750	85650	61260	259300	149900	76750	42280	28670	47280
CAL YR 1976	TOTAL	450619	MEAN	1231	MAX	7240	MIN	270	AC-FT	893800		
WTR YR 1977	TOTAL	610190	MEAN	1672	MAX	15200	MIN	376	AC-FT	1210000		

## GUADALUPE RIVER BASIN

08188500 SAN ANTONIO RIVER AT GOLIAD, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: September 1945 to September 1946, September 1958 to current year. Chemical and biochemical analyses: January 1968 to current year. Pesticide analyses: January 1968 to current year. Sediment records: October 1974 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: September 1945 to September 1946, September 1958 to current year.

WATER TEMPERATURES: September 1958 to current year.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,500 micromhos July 15, 17, 1969; minimum daily, 138 micromhos Oct. 27, 1960.

WATER TEMPERATURES: Maximum daily, 36.0°C June 5, 1969; minimum daily, 0.0°C on several days during winter months.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,250 micromhos Aug. 28; minimum daily, 220 micromhos Apr. 18, 23.

WATER TEMPERATURES: Maximum daily, 29.5°C on many days during summer months; minimum daily, 0.0°C on several days during winter months.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)
OCT 20...	1510	1260	440	7.4	18.0	38	300	7.6	83	3.4
NOV 18...	1550	1240	730	7.9	13.0	20	60	8.6	84	1.6
DEC 15...	1400	2830	670	7.8	13.5	45	180	8.7	86	2.6
JAN 12...	1415	1160	867	7.9	11.0	0	45	9.3	87	1.5
FEB 16...	1340	1490	729	--	15.5	7	80	8.0	82	1.4
MAR 16...	1525	973	915	7.7	21.0	5	45	8.7	100	2.3
APR 13...	1400	776	963	7.5	22.0	0	130	7.0	82	3.1
MAY 11...	1440	1640	896	7.7	25.0	0	120	7.0	86	1.2
JUN 08...	1300	1240	875	7.7	28.0	0	95	6.8	87	.6
JUL 13...	1440	621	1110	7.6	30.0	0	40	7.0	93	1.0
AUG 17...	1410	473	1170	7.5	30.0	20	40	7.0	93	1.0
SEP 14...	1510	544	1020	7.8	28.0	15	45	6.9	88	1.2
DATE	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL.-MF (COL. PER 100 ML)	FECAL STREPTOCOCCI (COL. PER 100 ML)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)
OCT 20...	22000	1800	2200	160	31	49	8.0	26	.9	5.8
NOV 18...	2400	350	1000	280	74	86	17	49	1.3	4.3
DEC 15...	24000	7400	43000	240	64	74	13	44	1.2	5.6
JAN 12...	11000	1100	2200	330	95	100	19	62	1.5	4.2
FEB 16...	2100	76	300	--	--	--	--	--	--	--
MAR 16...	2500	48	230	330	97	94	22	68	1.6	4.4
APR 13...	12000	1400	5800	330	100	99	21	76	1.8	5.0
MAY 11...	6300	150	1000	--	--	--	--	--	--	--
JUN 08...	5400	140	560	330	98	100	19	65	1.6	4.2
JUL 13...	6800	340	630	370	120	110	23	94	2.1	5.3
AUG 17...	7900	840	290	--	--	--	--	--	--	--
SEP 14...	14000	2300	4100	340	110	99	22	97	2.3	5.3



## GUADALUPE RIVER BASIN

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08188500 SAN ANTONIO RIVER AT GOLIAD, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	BICARBONATE (HCO <sub>3</sub> ) (MG/L)	CARBONATE (CO <sub>3</sub> ) (MG/L)	DISSOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)
OCT 20...	152	0	39	36	.3	12	250	251	736	144
NOV 18...	257	0	73	63	.3	15	469	434	159	22
DEC 15...	212	0	60	72	.3	15	411	388	568	60
JAN 12...	284	0	84	91	.2	16	538	516	132	18
FEB 16...	--	--	--	--	--	--	--	--	262	42
MAR 16...	278	0	88	100	.3	14	570	528	140	26
APR 13...	285	0	86	110	.3	17	594	555	378	94
MAY 11...	--	--	--	--	--	--	--	--	340	44
JUN 08...	280	0	93	86	.4	16	535	522	262	35
JUL 13...	310	0	110	140	.4	21	694	657	111	20
AUG 17...	--	--	--	--	--	--	--	--	107	8
SEP 14...	280	0	160	120	.4	19	636	661	117	33
DATE	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	PHENOLS (UG/L)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT 20...	1.4	.01	.06	1.1	.54	4.2	0	701	2390	100
NOV 18...	2.5	.05	.04	.65	.44	4.9	0	163	546	90
DEC 15...	1.9	.15	.09	.91	1.1	12	0	564	4310	97
JAN 12...	3.1	.02	.04	.96	.55	6.5	6	145	454	87
FEB 16...	2.3	.02	.04	.91	.51	5.8	17	226	909	89
MAR 16...	.10	.00	.07	1.0	.68	3.8	0	122	321	93
APR 13...	4.2	.03	.05	2.0	.93	9.2	3	169	354	92
MAY 11...	2.9	.00	.03	1.1	.54	8.5	1	355	1570	95
JUN 08...	2.9	.00	.01	.63	.52	13	1	276	924	98
JUL 13...	3.9	.03	.04	.93	.91	3.8	1	109	183	96
AUG 17...	4.7	.05	.02	1.3	2.2	7.8	2	100	128	92
SEP 14...	4.4	.00	.01	.45	7.0	7.8	0	112	165	94



## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

			TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)		
DATE	TIME										
MAR 16...	1525		3	2	200	0	0	20	0		
APR 13...	1400		6	4	200	0	0	<10	0		
JUL 13...	1440		3	3	200	<10	0	0	0		
DATE		TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)	
MAR 16...		0	0	2	0	2500	10	15	0	90	
APR 13...		0	0	5	2	5000	10	13	0	200	
JUL 13...		<50	0	10	1	2300	10	100	0	140	
DATE			DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)	
MAR 16...			0	.0	.0	0	0	0	30	0	
APR 13...			0	.0	.0	1	1	0	20	10	
JUL 13...			8	.0	.2	2	0	0	30	4	
DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	
NOV 18...	1550	--	--	--	ND	--	ND	--	ND	--	
FFB 16...	1340	--	--	--	ND	--	ND	--	ND	--	
MAR 16...	1525	.0	16	.00	.00	.0	.0	0	.00	.3	
APR 13...	1400	.0	18	.00	.00	.0	.0	7	.00	1.2	
MAY 11...	1440	--	--	--	ND	--	ND	--	ND	--	
JUL 13...	1440	.0	14	.00	.00	.0	.0	1	.00	.0	
AUG 17...	1410	--	--	--	ND	--	ND	--	ND	--	
DATE		TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)
NOV 18...	ND	--	ND	--	ND	.01	--	ND	--	ND	ND
FFB 16...	ND	--	ND	--	ND	ND	--	ND	--	ND	ND
MAR 16...	.00	.0	.00	.0	.07	.00	.0	.00	.0	.00	.00
APR 13...	.00	.0	.00	.0	.11	.00	.4	.00	.0	.00	.00
MAY 11...	ND	--	ND	--	ND	ND	--	ND	--	ND	ND
JUL 13...	.00	.1	.00	.0	.11	.00	.1	.00	.0	.00	.00
AUG 17...	ND	--	ND	--	ND	ND	--	ND	--	ND	ND

GUADALUPE RIVER BASIN

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08188500 SAN ANTONIO RIVER AT GOLIAD, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METH- OXY- CHLOR (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)
NOV 18...	ND	--	ND	--	ND	--	ND	ND	ND	ND
FEB 16...	ND	--	ND	--	ND	--	ND	ND	ND	ND
MAR 16...	.00	.0	.00	.0	.00	.0	.00	--	.00	.00
APR 13...	.00	.0	.00	.0	.01	.0	.00	--	.00	.00
MAY 11...	ND	--	ND	--	ND	--	ND	ND	ND	ND
JUL 13...	.00	.0	.00	.0	.00	.0	.00	--	.02	.00
AUG 17...	ND	--	ND	--	ND	--	ND	ND	ND	ND

DATE	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL ATRA- ZINE (UG/L)	SIMA- ZINE TOTAL COUL- SON COND. (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 18...	ND	ND	--	ND	ND	ND	ND	ND	ND
FEB 16...	ND	ND	--	ND	ND	ND	ND	ND	ND
MAR 16...	.00	0	0	.00	--	--	.00	.01	.00
APR 13...	.00	0	0	.00	--	--	.00	.00	.00
MAY 11...	ND	ND	--	ND	ND	ND	ND	ND	ND
JUL 13...	.50	0	0	.00	--	--	.00	.01	.00
AUG 17...	ND	ND	--	ND	ND	ND	ND	ND	ND

08188500 SAN ANTONIO RIVER AT GOLIAD, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 20,76 1510		NOV 18,76 1550		DEC 15,76 1400		JAN 12,77 1415		FEB 16,77 1340	
TOTAL CELLS/ML	5200		1300		3800		660		560	
DIVERSITY: DIVISION	1.1		0.7		0.6		1.3		1.4	
..CLASS	1.1		0.7		0.6		1.3		1.4	
..ORDER	1.2		0.7		0.6		1.4		1.4	
...FAMILY	1.3		1.0		0.0		1.4		2.0	
....GENUS	1.3		1.3		0.0		1.4		2.0	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....HYDRODICTYACEAE										
....PEDIASTRUM	--	-	--	-	--	-	--	-	--	-
....MICRACTINIACEAE										
....MICRACTINIUM	--	-	--	-	--	-	--	-	--	-
....OOCYSTACEAE										
....ANKISTRODESMUS	190	4	--	-	--	-	35	5	80	14
....OOCYSTIS	--	-	55	4	--	-	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	--	-
....TETRAEDRON	--	-	--	-	--	-	--	-	--	-
....SCENEDESMACEAE										
....CRUCIGENIA	--	-	990#	74	--	-	--	-	--	-
....SCENEDESMUS	--	-	69	5	--	-	--	-	--	-
....ULOTRICHALES	--	-	--	-	200	5	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	--	-	--	-	--	-	21	3	--	-
..ZYGNEMATALES										
....DESMIDIACEAE										
....CLOSTERIUM	190	4	--	-	--	-	--	-	--	-
....COSMARIUM	--	-	--	-	--	-	--	-	--	-
....STAUSTRUM	--	-	*	0	--	-	--	-	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
....COSCINODISCEAE										
....CYCLOTELLA	--	-	--	-	--	-	--	-	--	-
....MELOSIRA	--	-	--	-	--	-	--	-	--	-
....STEPHANODISCUS	--	-	--	-	--	-	--	-	--	-
..PENNIALES										
...FRAGILARIACEAE										
....SYNEDRA	--	-	*	0	--	-	*	0	--	-
....NAVICULACEAE										
....NAVICULA	190	4	--	-	67	2	--	-	160#	29
....NITZSCHIA	190	4	34	3	130	4	160#	24	160#	29
....SURIPELLACEAE	190	4	--	-	--	-	--	-	--	-
....SURIPELLA	190	4	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCALES										
....CHROCOCCACEAE										
....AGMENELLUM	--	-	--	-	--	-	--	-	--	-
....ANACYSTIS	--	-	--	-	--	-	--	-	160#	29
...HORMOGONALES										
....NOSTOCACEAE										
....ANABAENA	--	-	7	1	--	-	--	-	--	-
....OSCILLATORIA	--	-	--	-	--	-	--	-	--	-
....LYNGBYA	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	4100#	78	180	13	3400#	89	430#	65	--	-
....PHORMIDIUM	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDAE										
....CRYPTOCHRYSIDACEAE										
....CHROOMONAS	--	-	--	-	--	-	7	1	--	-
....CRYPTOMONODACEAE										
....CRYPTOMONAS	--	-	--	-	--	-	--	-	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
....EUGLENA	190	4	--	-	--	-	--	-	--	-
....EUGLENA	190	4	--	-	--	-	--	-	--	-
....TRACHELOMONAS	--	-	--	-	--	-	7	1	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...PERIDINIALES										
....PERIDINIACEAE										
....PERIDINIUM	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

08188500 SAN ANTONIO RIVER AT GOLIAD, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	MAY 11,77 1440	JUN 8,77 1300	JUL 13,77 1440	AUG 17,77 1410	SEP 14,77 1510					
TOTAL CELLS/ML	1700	3500	1400	2000	24000					
DIVERSITY: DIVISION	0.7	0.6	1.1	1.2	1.3					
..CLASS	0.7	0.6	1.1	1.2	1.3					
..ORDER	0.7	0.6	2.0	1.4	1.3					
...FAMILY	0.8	0.6	2.1	1.6	1.3					
....GENUS	0.8	0.8	2.5	1.7	1.8					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....HYDRODICTYACEAE										
.....PEDIASTRUM	--	-	--	-	--	-	--	-	7700#	32
....MICRACTINIACEAE										
.....MICRACTINIUM	--	-	--	-	--	-	30	1	--	-
....OOCYSTACEAE										
.....ANKISTRODESMUS	52	3	--	-	36	3	74	4	--	-
.....OOCYSTIS	--	-	--	-	--	-	--	-	--	-
.....SLENASTRUM	10	1	--	-	--	-	--	-	--	-
.....TETRAEDRON	--	-	--	-	--	-	*	0	--	-
....SCENEDESMACEAE										
.....CRUCIGENIA	--	-	--	-	72	5	--	-	--	-
.....SCENEDESMUS	--	-	--	-	54	4	130	7	--	-
....ULOTRICHALES	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	21	1	57	2	--	-	--	-	--	-
....ZYGEMATALES										
.....DESMIDIACEAE										
.....CLOSTERIUM	--	-	--	-	--	-	--	-	--	-
.....COSMARIUM	--	-	--	-	18	1	--	-	--	-
.....STAUSTRUM	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
....COSCINODISCACEAE										
.....CYCLOTELLA	31	2	85	2	27	2	130	7	--	-
....MFLOSIRA	--	-	3000#	85	--	-	--	-	--	-
....STEPHANODISCUS	--	-	--	-	--	-	96	5	--	-
...PENNALES										
....FRAGILARIACEAE										
.....SYNDRA	--	-	--	-	18	1	*	0	--	-
....NAVICULACEAE										
.....NAVICULA	21	1	--	-	110	8	15	1	1900	8
....NITZSCHACEAE										
.....NITZSCHIA	42	3	28	1	--	-	--	-	--	-
....SURIPELLACEAE										
.....SURIPELLA	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCALES										
....CHROCOCCACEAE										
.....AGMENELLUM	--	-	--	-	630#	46	--	-	--	-
.....ANACYSTIS	--	-	--	-	--	-	59	3	--	-
....HORMOGONALES										
.....NOSTOCACEAE										
.....ANABAEANA	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIACEAE										
.....LYNGBYA	--	-	--	-	--	-	--	-	8700#	36
.....OSCILLATORIA	1500#	89	340	10	220#	16	1400#	71	5800#	24
.....PHORMIDIUM	--	-	--	-	170	13	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
....CRYPTOCHRYSIDACEAE										
.....CHROOMONAS	--	-	--	-	--	-	--	-	--	-
....CRYPTOMONODACEAE										
.....CRYPTOMONAS	--	-	--	-	--	-	*	0	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
....EUGLENACEAE										
.....EUGLENA	10	1	--	-	--	-	30	1	--	-
....TRACHELOMONAS	--	-	--	-	18	1	--	-	--	-
PYRPHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...PERIDINIALES										
....PERIDINIACEAE										
.....PERIDINIUM	--	-	--	-	--	-	*	0	--	-

NOTE: # - DOMINANT ORGANISM: EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM: MAY NOT HAVE BEEN COUNTED: LESS THAN 1/2%

GUADALUPE RIVER BASIN  
08188500 SAN ANTONIO RIVER AT GOLIAD, TX.--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	57252	452	260	40500	30	4700	40	6140	170
NOV. 1976.....	72100	532	310	60600	40	7840	49	9600	200
DEC. 1976.....	56910	672	400	60900	60	9230	66	10100	240
JAN. 1977.....	45250	834	490	60400	86	10500	84	10200	300
FEB. 1977.....	43180	812	480	56100	82	9570	81	9500	290
MAR. 1977.....	30885	949	570	47100	110	8890	95	7950	330
APR. 1977.....	130716	421	250	87400	29	10300	34	12100	160
MAY 1977.....	75590	661	390	79500	59	12100	64	13200	240
JUNE 1977.....	38696	862	510	53500	94	9770	86	8940	310
JULY 1977.....	21316	1070	640	36600	130	7420	110	6200	370
AUG. 1977.....	14456	1190	710	27700	150	5880	120	4740	400
SEPT 1977.....	23839	792	470	30100	85	5450	78	5040	280
TOTAL .....	610190	**	**	640000	**	102000	**	104000	**
WTD.AVG. ....	1671.75	659	390	**	62	**	63	**	240

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	375	322	705	835	880	907	978	811	897	907	1140	1230
2	435	331	756	864	775	893	970	762	900	900	1150	1170
3	569	381	788	874	722	915	987	805	904	933	1160	1160
4	599	482	805	881	715	904	996	825	915	950	1130	1170
5	689	539	842	874	792	897	1000	856	886	966	1140	1150
6	510	567	785	871	844	904	996	861	873	970	1170	1140
7	420	598	480	881	867	915	1000	875	885	996	1180	1160
8	635	632	363	864	894	922	961	902	900	1000	1160	1160
9	479	646	637	875	905	900	966	891	907	1030	1190	1180
10	507	664	643	881	888	907	982	902	930	1060	1200	1160
11	582	676	746	903	895	900	991	850	938	1090	1200	1100
12	661	685	803	900	875	904	1000	513	966	1110	1190	1070
13	750	693	830	889	686	930	1000	446	1010	1130	1180	1000
14	821	716	789	882	583	938	1030	487	1020	1150	1170	850
15	856	739	675	836	698	950	990	694	448	1160	1160	470
16	628	725	615	824	739	966	911	762	424	1120	1150	488
17	300	747	687	815	806	1000	356	700	868	1090	1180	419
18	450	725	725	868	842	966	220	729	1000	1110	1170	467
19	616	759	772	889	871	958	292	743	1030	1120	1200	574
20	462	774	550	900	881	1000	350	775	1060	1100	1210	700
21	498	791	394	900	891	974	424	811	1070	1160	1230	839
22	562	643	651	889	888	974	276	650	1070	1150	1220	926
23	489	572	730	896	895	983	220	361	1080	1130	1170	996
24	459	608	770	875	909	991	273	420	1090	1120	1200	1030
25	523	693	803	723	888	983	345	502	1100	1120	1200	1050
26	399	729	824	679	891	991	444	578	1030	1130	1230	1080
27	388	468	827	644	920	1010	636	679	996	1140	1240	1120
28	429	349	830	732	927	1020	700	762	922	1140	1250	1110
29	450	572	833	827	---	1010	745	819	911	1150	1230	1060
30	350	608	838	858	---	1000	779	849	919	1160	1240	1130
31	245	---	848	885	---	1010	---	882	---	1150	1230	---
MEAN	521	614	721	849	835	952	727	726	932	1080	1190	972

## GUADALUPE RIVER BASIN

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08188500 SAN ANTONIO RIVER AT GOLIAD, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.5	13.0	4.5	0.0	4.5	15.5	10.0	18.5	24.0	24.0	29.5	24.0
2	18.5	13.0	4.5	0.0	7.0	18.5	13.0	21.0	26.5	21.0	29.5	26.5
3	21.0	7.0	10.0	1.5	7.0	15.5	15.5	24.0	21.0	21.0	26.5	24.0
4	18.5	13.0	7.0	4.5	10.0	13.0	10.0	21.0	26.5	24.0	29.5	24.0
5	18.5	13.0	15.5	7.0	10.0	10.0	7.0	24.0	29.5	24.0	26.5	21.0
6	13.0	15.5	13.0	4.5	13.0	10.0	10.0	21.0	29.5	26.5	29.5	24.0
7	13.0	18.5	4.5	1.5	7.0	7.0	13.0	24.0	26.5	26.5	29.5	24.0
8	10.0	13.0	7.0	4.5	10.0	7.0	10.0	24.0	24.0	29.5	29.5	24.0
9	10.0	18.5	13.0	1.5	7.0	10.0	13.0	21.0	26.5	26.5	26.5	21.0
10	10.0	18.5	18.5	0.0	13.0	7.0	18.5	26.5	24.0	24.0	26.5	24.0
11	13.0	18.5	7.0	0.0	13.0	13.0	18.5	18.5	26.5	24.0	26.5	21.0
12	15.5	10.0	7.0	7.0	10.0	7.0	18.5	18.5	29.5	26.5	26.5	24.0
13	18.5	4.5	10.0	7.0	7.0	15.5	18.5	24.0	29.5	26.5	26.5	24.0
14	18.5	4.5	10.0	4.5	10.0	18.5	13.0	21.0	26.5	26.5	26.5	21.0
15	15.5	4.5	10.0	1.5	10.0	18.5	10.0	21.0	21.0	29.5	29.5	21.0
16	10.0	7.0	13.0	1.5	1.5	18.5	15.5	21.0	21.0	29.5	29.5	21.0
17	10.0	4.5	13.0	0.0	4.5	21.0	15.5	21.0	24.0	26.5	26.5	24.0
18	10.0	10.0	13.0	4.5	10.0	18.5	18.5	21.0	26.5	29.5	26.5	24.0
19	15.5	10.0	13.0	1.5	10.0	18.5	18.5	21.0	29.5	26.5	29.5	24.0
20	---	13.0	7.0	4.5	13.0	10.0	18.5	24.0	29.5	26.5	26.5	21.0
21	10.0	15.5	0.0	10.0	13.0	13.0	18.5	21.0	29.5	26.5	26.5	21.0
22	13.0	13.0	4.5	7.0	10.0	10.0	15.5	18.5	26.5	29.5	26.5	21.0
23	18.5	10.0	4.5	10.0	15.5	15.5	21.0	18.5	24.0	24.0	26.5	21.0
24	18.5	10.0	5.5	7.0	18.5	18.5	18.5	21.0	24.0	26.5	29.5	24.0
25	13.0	13.0	10.0	7.0	18.5	18.5	13.0	21.0	24.0	24.0	26.5	24.0
26	13.0	15.5	1.5	7.0	13.0	18.5	10.0	18.5	24.0	24.0	26.5	24.0
27	13.0	10.0	7.0	7.0	13.0	15.5	18.5	24.0	21.0	26.5	29.5	24.0
28	10.0	0.0	7.0	10.0	15.5	13.0	18.5	24.0	24.0	24.0	24.0	24.0
29	7.0	1.5	7.0	0.0	---	10.0	18.5	24.0	24.0	24.0	24.0	24.0
30	7.0	1.5	10.0	7.0	---	13.0	15.5	21.0	24.0	24.0	24.0	21.0
31	7.0	---	0.0	4.5	---	13.0	---	24.0	---	24.0	24.0	---
MEAN	13.5	10.5	8.5	4.5	10.5	14.0	15.0	21.5	25.5	25.5	27.0	23.0



## GUADALUPE RIVER BASIN

08188600 GUADALUPE-BLANCO RIVER AUTHORITY CALHOUN CANAL FLUME NO. 1 NEAR LONG MOTT, TX

LOCATION.--Lat 28°29'44", long 96°46'18", Calhoun County, Hydrologic Unit 12100204, on right bank at concrete Parshall flume No. 1, 518 ft (158 m) upstream from State Highway 185, 1,900 ft (579 m) downstream from pumping station on Goff Bayou, and 1.1 mi (1.8 km) north-west of Long Mott.

PERIOD OF RECORD.--March 1968 to February 1970 (monthly discharge only), March 1970 to current year.

GAGE.--Deflection-vane recorder, duplex water-stage recorder and Parshall flume. Datum of gage is 23.53 ft (7.172 m) above mean sea level.

REMARKS.--Records fair. Flow diverted from Guadalupe River 550 ft (168 m) upstream from Guadalupe River near Tivoli (station 08188800), and then through a system of canals, Hog Bayou, and Goff Bayou, a distance of 8.9 mi (14.3 km) to the pumping station on Goff Bayou 1,900 ft (579 m) upstream from flume No. 1. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--9 years (water years 1969-77), 102 ft<sup>3</sup>/s (2.889 m<sup>3</sup>/s), 73,900 acre-ft/yr (91.1 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 311 ft<sup>3</sup>/s (8.81 m<sup>3</sup>/s) July 7, 1968; no flow at times in 1968-74 and 1977.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	183	43	31	25	15	50	51	60	265	254	168	.00
2	177	54	24	27	5.2	49	51	81	230	255	168	58
3	167	49	35	28	16	30	61	100	225	257	196	144
4	155	34	53	21	12	28	88	106	225	247	207	110
5	131	22	40	21	2.3	34	116	101	225	244	215	143
6	114	27	62	23	5.9	29	117	107	250	251	211	183
7	113	12	33	21	.00	23	98	137	255	236	191	224
8	75	20	40	31	.00	.10	87	160	255	226	183	248
9	63	27	40	22	.00	6.3	99	150	255	229	184	247
10	71	18	61	29	.00	1.2	98	136	255	233	175	242
11	74	22	60	37	.00	.10	114	135	265	232	205	227
12	60	31	55	37	5.2	12	131	139	290	201	214	223
13	61	14	48	35	6.3	.50	108	181	270	210	201	228
14	61	6.5	42	26	10	5.5	100	203	290	229	184	194
15	60	19	51	21	13	.20	133	192	146	238	184	156
16	54	17	35	39	18	17	83	193	81	231	193	155
17	48	17	31	28	.00	47	32	175	102	225	189	156
18	48	19	14	32	6.5	55	31	179	184	214	194	159
19	39	25	18	32	24	60	34	200	202	204	192	178
20	16	21	30	17	9.8	61	22	205	229	185	186	190
21	27	22	16	31	24	61	27	148	253	175	186	190
22	42	20	27	25	17	62	33	100	283	186	215	196
23	31	23	24	33	31	68	30	99	301	179	240	216
24	27	28	17	21	15	81	37	100	291	172	222	189
25	29	27	26	30	37	108	66	133	257	160	198	190
26	15	38	28	21	39	124	98	166	229	154	219	180
27	20	26	27	7.1	36	126	142	181	225	156	240	173
28	8.3	31	11	7.9	45	91	180	181	228	156	241	173
29	17	26	22	13	---	62	187	184	250	156	202	167
30	6.4	29	16	15	---	51	150	220	253	156	133	137
31	25	---	23	1.1	---	52	---	250	---	157	42	---
TOTAL	2017.7	767.5	1040	757.1	393.20	1394.90	2604	4702	7069	6408	5978	5276.00
MEAN	65.1	25.6	33.5	24.4	14.0	45.0	86.8	152	236	207	193	176
MAX	183	54	62	39	45	126	187	250	301	257	241	248
MIN	6.4	6.5	11	1.1	.00	.10	22	60	81	154	42	.00
AC-FT	4000	1520	2060	1500	780	2770	5170	9330	14020	12710	11860	10460
CAL YR 1976	TOTAL	37748.60	MEAN	103	MAX	257	MIN	6.4	AC-FT	74870		
WTR YR 1977	TOTAL	38407.40	MEAN	105	MAX	301	MIN	.00	AC-FT	76180		

## GUADALUPE RIVER BASIN

365

08188750 GUADALUPE-BLANCO RIVER AUTHORITY CALHOUN CANAL FLUME NO. 2 NEAR LONG MOTT, TX

LOCATION.--Lat 28°30'09", long 96°45'40", Calhoun County, Hydrologic Unit 12100204, on left bank at concrete Parshall flume No. 2, 3,700 ft (1,130 m) downstream from State Highway 185, 4,200 ft (1,280 m) downstream from streamflow station 08188600, and 1.4 mi (2.3 km) north of Long Mott.

PERIOD OF RECORD.--October 1971 to June 1972 (monthly discharge only), July 1972 to current year.

GAGE.--Deflection-vane recorder, water-stage recorder, and Parshall flume. Datum of gage is 22.37 ft (6.818 m) above mean sea level.

REMARKS.--Records fair. Flow diverted from Guadalupe River 550 ft (168 m) upstream from Guadalupe River near Tivoli (station 08188800), and then through a system of canals, Hog Bayou, and Goff Bayou, a distance of 8.9 mi (14.3 km) to the pumping station on Goff Bayou 1,900 ft (579 m) upstream from flume No. 1. Diversions to the Union Carbide Co. between flumes 1 (station 08188600) and 2 during the current year were 17,700 acre-ft (21.9 hm<sup>3</sup>). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--6 years, 82.1 ft<sup>3</sup>/s (2.325 m<sup>3</sup>/s), 59,480 acre-ft/yr (73.3 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 282 ft<sup>3</sup>/s (7.99 m<sup>3</sup>/s) June 23, 1975; no flow at times in 1972-77.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	158	15	.00	.00	.00	9.2	30	2.5	244	258	143	.00
2	152	25	.00	.00	.00	5.2	15	9.9	210	244	145	35
3	143	25	5.0	.00	.00	.30	40	30	203	245	178	85
4	135	10	10	.00	.00	.00	59	46	200	239	195	89
5	112	.00	10	.00	.00	.00	102	38	203	238	203	97
6	96	.00	10	.00	.00	2.8	102	49	230	246	197	121
7	96	.00	5.0	.00	.00	5.9	80	92	235	236	175	165
8	75	.00	.00	.00	.00	.00	66	117	235	226	165	192
9	41	.00	.00	.00	.00	.00	86	105	245	212	169	192
10	48	.00	10	5.0	.00	.00	83	92	250	213	157	187
11	40	.00	15	15	.00	.00	95	91	255	211	156	174
12	40	.00	15	15	.00	.00	114	97	269	183	181	174
13	40	.00	25	15	.00	.00	89	141	261	194	151	180
14	40	.00	30	15	.00	.00	82	186	219	214	133	137
15	40	.00	30	15	.00	.00	116	187	92	222	131	97
16	30	.00	25	15	.00	.00	59	188	30	215	141	97
17	25	.00	5.0	20	.00	.00	15	163	46	210	164	98
18	25	.00	.00	30	.00	7.0	15	168	134	196	171	100
19	15	.00	.00	30	.00	15	15	193	149	187	167	116
20	.00	.00	.00	20	.00	15	5.0	197	185	161	157	128
21	.00	.00	.00	15	.00	15	5.0	143	216	156	158	128
22	.00	.00	.00	15	.00	15	15	87	249	162	182	135
23	.00	.00	.00	15	.00	20	15	86	271	155	196	160
24	.00	.00	.00	15	4.0	40	3.3	89	258	145	197	158
25	.00	.00	.00	15	6.9	44	23	119	210	135	198	160
26	.00	8.0	.00	.00	2.1	68	74	154	210	130	199	150
27	.00	12	.00	.00	9.5	98	125	168	208	130	200	146
28	.00	15	.00	.00	13	66	168	168	214	131	201	145
29	.00	10	.00	.00	---	19	164	170	242	130	182	141
30	.00	.00	.00	.00	---	30	100	210	252	130	133	126
31	.00	---	.00	.00	---	30	---	230	---	133	42	---
TOTAL	1351.00	120.00	195.00	270.00	35.50	505.40	1960.3	3816.4	6225	5887	5167	3913.00
MEAN	43.6	4.00	6.29	8.71	1.27	16.3	65.3	123	208	190	167	130
MAX	158	25	30	30	13	98	168	230	271	258	203	192
MIN	.00	.00	.00	.00	.00	.00	3.3	2.5	30	130	42	.00
AC-FT	2680	238	387	536	70	1000	3890	7570	12350	11680	10250	7760
CAL YR 1976	TOTAL	28931.30	MEAN	79.0	MAX	257	MIN	.00	AC-FT	57390		
WTR YR 1977	TOTAL	29445.60	MEAN	80.7	MAX	271	MIN	.00	AC-FT	58410		

## GUADALUPE RIVER BASIN

08188800 GUADALUPE RIVER NEAR TIVOLI, TX

LOCATION.--Lat 28°30'20", long 96°53'04", Calhoun-Refugio County line, Hydrologic Unit 12100204, on right bank at diversion dam and salt-water barrier, 550 ft (168 m) downstream from Calhoun County Irrigation Canal intake, 0.4 mi (0.6 km) downstream from San Antonio River, 3.5 mi (5.6 km) north of Tivoli, and at mile 10.2 (16.4 km). Water-quality sampling site on left bank 474 ft (144 m) upstream.

DRAINAGE AREA.--10,128 mi<sup>2</sup> (26,232 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1965 to current year.

REVISED RECORDS.--WDR TX-68-1: Drainage area.

GAGE.--Duplex water-stage recorder. Datum of gage is 0.04 ft (0.012 m) above mean sea level.

REMARKS.--Many small diversions above station. Some regulation by powerplants. Upstream regulation same as that for Guadalupe River at Cuero (station 08175800) and San Antonio River at Goliad (station 08188500).

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height (above barrier), 13.7 ft (4.18 m) Sept. 22, 1967; minimum, 1.5 ft (0.46 m) Mar. 16, 1967. Maximum gage height (below barrier), 13.6 ft (4.15 m) Sept. 22, 1967; minimum, 0.5 ft (0.15 m) July 12, 14, 1967.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1936, that of Sept. 22, 1967. Flood in July 1936 reached a stage of 11 ft (3.4 m), present site and datum. Levees along the Navigation Canal from San Antonio Bay to Victoria were built in 1961 and decreased the flood plain materially.

EXTREMES FOR CURRENT YEAR.--Maximum gage height (above barrier), 9.6 ft (2.93 m) Apr. 25, 26; minimum, 3.9 ft (1.19 m) Aug. 25-27, 29, Sept. 8. Maximum gage height (below barrier), 9.5 ft (2.90 m) Apr. 25, 26; minimum, 3.7 ft (1.13 m) Aug. 25, 26, 29.

MAXIMUM DAILY GAGE HEIGHT, IN FEET, UPSTREAM AND DOWNSTREAM FROM SALTWATER BARRIER,  
WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	OCT		NOV		DEC		JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP	
	up	down	up	down	up	down	up	down	up	down	up	down	up	down	up	down	up	down	up	down	up	down	up	down
1	7.7	7.6	8.1	8.0	8.0	8.0	7.9	7.7	7.8	7.7	7.7	7.6	7.4	7.3	8.1	8.0	7.6	7.4	7.5	7.1	5.8	5.4	5.3	5.2
2	7.8	7.6	8.1	8.0	8.0	8.0	7.9	7.7	7.8	7.7	7.6	7.6	7.4	7.4	8.0	8.0	7.9	7.4	7.5	7.1	5.7	5.2	5.4	5.2
3	7.8	7.6	8.1	8.1	7.9	7.8	7.9	7.7	7.9	7.8	7.7	7.6	7.4	7.4	8.0	7.9	7.8	7.4	7.4	7.0	5.6	5.2	5.2	5.1
4	7.6	7.5	8.2	8.1	7.8	7.8	7.9	7.7	7.9	7.8	7.7	7.6	7.4	7.4	8.0	7.9	7.7	7.5	7.4	6.9	5.6	5.2	4.8	4.6
5	7.4	7.2	8.3	8.2	7.8	7.7	7.9	7.7	7.9	7.8	7.6	7.6	7.3	7.2	7.9	7.8	7.7	7.3	7.2	6.9	5.6	5.2	4.6	4.5
6	7.1	7.0	8.3	8.2	7.8	7.7	7.9	7.7	7.9	7.8	7.6	7.6	7.3	7.2	7.9	7.8	7.7	7.4	7.1	6.8	5.6	5.1	4.6	4.5
7	7.3	7.3	8.2	8.1	7.9	7.8	7.8	7.7	7.8	7.7	7.6	7.5	7.2	7.1	7.9	7.8	7.6	7.4	7.0	6.7	5.3	4.8	4.2	4.0
8	7.6	7.4	8.0	8.0	8.0	7.9	7.8	7.6	7.8	7.7	7.6	7.5	7.2	7.1	7.9	7.8	7.5	7.3	7.0	6.7	5.2	4.8	3.9	3.8
9	7.7	7.6	8.0	7.9	8.1	7.9	7.8	7.6	7.8	7.7	7.6	7.5	7.1	7.1	7.9	7.7	7.5	7.3	6.9	6.6	5.1	4.7	4.0	3.9
10	7.7	7.6	7.9	7.8	8.1	8.0	7.7	7.6	7.8	7.7	7.6	7.5	7.1	7.0	7.8	7.7	7.5	7.3	6.9	6.6	5.0	4.6	4.8	4.6
11	7.6	7.6	7.9	7.8	8.2	8.0	7.7	7.6	7.8	7.8	7.6	7.5	7.1	7.0	7.8	7.7	7.5	7.3	6.8	6.4	4.8	4.4	4.8	4.6
12	7.2	7.2	7.8	7.8	8.2	8.0	7.7	7.6	7.9	7.8	7.6	7.5	7.1	7.0	7.8	7.7	7.7	7.4	6.6	6.4	4.8	4.4	4.8	4.6
13	6.7	6.6	7.8	7.7	8.1	7.9	7.8	7.6	7.9	7.8	7.6	7.5	7.0	6.9	8.0	7.8	7.8	7.4	6.5	6.2	4.7	4.3	4.6	4.5
14	6.3	6.2	7.8	7.7	8.1	7.9	7.8	7.6	8.0	7.9	7.6	7.5	7.1	7.0	8.0	7.9	7.7	7.4	6.5	6.2	4.7	4.3	5.0	4.8
15	5.9	5.9	7.8	7.7	8.0	7.9	7.8	7.7	8.0	7.9	7.6	7.5	7.1	7.0	8.0	7.9	8.1	7.8	6.4	6.1	4.7	4.3	5.1	4.9
16	6.6	6.5	7.7	7.7	8.0	7.9	7.9	7.7	8.0	7.9	7.5	7.4	7.2	7.1	8.0	7.9	8.1	7.9	6.4	6.1	4.6	4.3	7.2	7.0
17	7.6	7.5	7.7	7.6	8.0	7.9	7.9	7.8	8.0	7.9	7.5	7.4	7.8	7.6	8.0	7.9	8.2	7.9	6.5	6.2	4.4	4.1	7.7	7.4
18	7.9	7.8	7.7	7.6	8.1	7.9	7.9	7.8	7.9	7.8	7.5	7.4	7.9	7.8	8.0	7.9	8.2	7.8	6.6	6.3	4.3	4.0	7.9	7.7
19	8.0	7.9	7.8	7.8	8.1	7.9	7.9	7.8	7.9	7.8	7.5	7.4	8.0	7.9	8.0	7.9	8.1	7.8	6.6	6.3	4.2	3.9	7.9	7.7
20	8.0	7.9	7.9	7.8	8.1	7.9	7.8	7.7	7.9	7.8	7.4	7.3	8.1	8.0	8.0	7.8	7.9	7.6	6.5	6.3	4.2	3.9	7.7	7.5
21	8.0	7.9	7.9	7.8	8.1	7.9	7.8	7.7	7.8	7.7	7.4	7.3	8.4	8.3	8.0	7.8	7.8	7.5	6.5	6.2	4.1	3.8	7.0	6.7
22	7.8	7.8	7.9	7.8	8.1	7.9	7.8	7.7	7.8	7.7	7.4	7.3	8.7	8.6	8.0	7.8	7.6	7.4	6.4	6.1	4.0	3.8	6.3	6.0
23	7.9	7.8	7.9	7.9	8.1	7.9	7.7	7.6	7.8	7.7	7.4	7.3	8.8	8.7	8.0	7.8	7.6	7.3	6.3	6.0	4.0	3.8	5.5	5.3
24	7.9	7.8	7.9	7.9	8.1	7.9	7.7	7.7	7.8	7.7	7.4	7.2	9.3	9.2	8.0	7.9	7.6	7.2	6.3	5.9	4.0	3.8	5.3	5.0
25	7.9	7.8	7.9	7.9	8.1	7.8	7.8	7.7	7.7	7.6	7.4	7.2	9.6	9.5	8.0	7.9	7.5	7.2	6.2	5.9	3.9	3.7	5.1	4.9
26	7.8	7.7	7.9	7.8	8.0	7.8	7.9	7.8	7.7	7.6	7.4	7.3	9.6	9.5	8.0	7.9	7.5	7.2	6.2	5.8	3.9	3.7	4.8	4.6
27	8.0	7.9	7.8	7.8	8.0	7.8	8.0	7.9	7.7	7.6	7.4	7.3	9.5	9.4	8.0	7.9	7.5	7.2	6.2	5.8	3.9	3.8	4.6	4.4
28	8.1	8.0	7.9	7.9	8.0	7.8	8.0	7.9	7.7	7.6	7.4	7.3	9.2	9.2	8.0	7.9	7.6	7.2	6.2	5.8	4.0	3.8	4.3	4.1
29	8.1	8.0	8.0	7.9	8.0	7.8	8.0	7.8	---	---	7.4	7.3	8.8	8.7	7.9	7.8	7.6	7.2	6.2	5.8	3.9	3.7	4.2	3.9
30	8.1	8.0	8.0	8.0	7.9	7.7	7.9	7.8	---	---	7.4	7.3	8.3	8.3	7.8	7.7	7.6	7.2	6.0	5.6	4.0	3.8	4.3	4.0
31	8.1	8.0	---	---	7.9	7.7	7.8	7.7	---	---	7.4	7.3	---	---	7.7	7.6	---	---	5.9	5.4	4.7	4.5	---	---

08188800 GUADALUPE RIVER NEAR TIVOLI, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1965 to current year. Chemical and biochemical analyses: October 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1965 to current year.

WATER TEMPERATURES: October 1965 to current year.

INSTRUMENTATION.--Specific conductance is recorded continuously at this station.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,000 micromhos June 1, 1971; minimum daily, 170 micromhos Oct. 30, 1972.

WATER TEMPERATURES (1966-69): Maximum daily, 32.0°C on several days during June, July, and August 1967-69; minimum daily, 8.0°C Jan. 15, 1968.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 889 micromhos Sept. 16; minimum daily, 282 micromhos Apr. 26.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS (MG/L)
OCT 29...	1120	432	8.0	15.0	--	--	--	--	--	150	31
NOV 16...	1210	677	7.8	13.0	20	60	8.5	83	.7	280	55
JAN 13...	1445	781	7.9	12.0	0	30	10.0	96	1.2	310	74
MAR 17...	1305	784	7.8	20.5	5	35	8.0	91	2.2	290	51
APR 13...	1640	791	8.2	23.5	--	--	--	--	--	280	45
MAY 12...	1330	760	7.7	24.5	0	95	6.9	84	3.8	290	62
JUL 14...	1220	741	7.6	30.0	0	40	5.4	72	1.5	280	49
AUG 16...	1515	810	7.8	31.0	--	--	--	--	--	260	26
SEP 15...	1325	701	7.7	28.5	20	60	6.8	88	1.2	250	51

DATE	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)
OCT 29...	48	7.6	26	.9	5.6	147	0	34	37	.2
NOV 18...	84	17	37	1.0	3.6	274	0	50	54	.3
JAN 13...	95	18	52	1.3	3.4	290	0	60	78	.3
MAR 17...	86	18	52	1.3	3.4	290	0	56	80	.3
APR 13...	82	19	49	1.3	2.9	290	0	57	78	.3
MAY 12...	87	17	44	1.1	3.8	275	0	65	66	.3
JUL 14...	82	18	48	1.3	2.9	280	0	56	76	.3
AUG 16...	81	13	59	1.6	3.4	280	0	80	82	.3
SEP 15...	73	16	54	1.5	3.6	240	0	50	79	.2

DATE	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	VOL. NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 29...	13	244	--	--	--	--	--	--	--	--
NOV 18...	14	395	138	20	1.5	.01	.03	.60	.36	4.2
JAN 13...	14	464	64	12	1.8	.02	.04	.59	.28	5.2
MAR 17...	12	451	84	16	1.7	.01	.07	.57	.29	2.9
APR 13...	15	446	--	--	--	--	--	--	--	--
MAY 12...	16	435	254	6	1.5	.01	.01	.73	.35	7.9
JUL 14...	16	437	107	18	1.6	.01	.01	.34	.21	3.0
AUG 16...	17	474	--	--	--	--	--	--	--	--
SEP 15...	17	411	138	31	2.3	.04	.06	.04	.31	4.0

## GUADALUPE RIVER BASIN

08188800 GUADALUPE RIVER NEAR TIVOLI, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JAN 13...	1445	2	100	0	1	0	10
MAR 17...	1305	2	200	0	0	3	10
MAY 12...	1330	2	100	0	0	1	20
JUL 14...	1220	2	0	0	0	1	10

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JAN 13...	2	10	.0	1	0	10
MAR 17...	0	10	.0	0	0	0
MAY 12...	0	0	.0	0	0	10
JUL 14...	0	4	.0	1	0	0

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLOR- INATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
JAN 13...	1445	.0	9	.00	.00	.0	.0	6	.00	2.0	.00	2.4
MAR 17...	1305	.0	23	.00	.00	.0	.0	11	.00	2.5	.00	.0
MAY 12...	1330	.0	8	.00	.00	.0	.0	5	.00	1.9	.00	1.7
JUL 14...	1220	.0	9	.00	.00	.0	.0	0	.00	.6	.00	1.1

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DIALDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
JAN 13...	.00	.4	.02	.00	.9	.00	.0	.00	.00	.0	.00	.0
MAR 17...	.00	.0	.02	.00	1.2	.00	.0	.00	.00	.0	.00	.1
MAY 12...	.00	.0	.04	.00	.0	.00	.0	.00	.00	.0	.00	.0
JUL 14...	.00	.0	.01	.00	.2	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
JAN 13...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
MAR 17...	.00	.0	.00	.00	.00	.00	0	0	.00	.01	.00	.00
MAY 12...	.00	.0	.00	.00	.00	.00	0	0	.00	.03	.02	.00
JUL 14...	.00	.0	.00	.00	.00	.02	0	0	.00	.06	.00	.00

08188800 GUADALUPE RIVER NEAR TIVOLI, TX.--Continued

## SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER				NOVEMBER				DECEMBER			JANUARY	
1	527	446	478	425	324	363	491	437	464	777	750	764
2	446	388	407	339	325	333	500	477	488	795	770	782
3	525	399	454	331	325	328	534	504	519	830	805	818
4	554	482	527	354	330	340	603	557	577	833	827	830
5	503	471	489	405	355	378	637	603	620	838	823	830
6	527	505	515	465	406	436	668	637	652	823	794	808
7	568	525	555	514	465	491	704	637	670	810	802	806
8	653	585	619	541	512	527	687	546	616	809	800	804
9	585	455	520	549	527	538	536	460	484	816	805	810
10	568	468	532	585	563	575	518	460	480	825	818	822
11	516	470	492	603	585	597	521	497	506	815	812	816
12	552	516	535	616	601	611	505	492	496	81	809	814
13	612	554	579	626	612	621	585	506	542	824	807	816
14	622	612	618	651	626	637	589	528	555	841	827	834
15	626	610	621	663	640	652	605	532	569	841	802	822
16	639	620	624	683	665	674	637	552	586	850	822	836
17	662	308	532	696	681	688	662	576	607	839	802	820
18	489	316	399	700	686	693	589	568	580	852	819	836
19	456	328	386	707	674	688	610	561	593	850	844	847
20	564	434	480	684	660	672	603	550	567	845	820	832
21	514	414	469	660	628	640	628	568	603	820	807	814
22	417	414	415	672	630	650	614	456	531	809	798	804
23	490	413	441	710	670	686	489	454	478	809	799	805
24	489	446	472	707	639	667	578	489	537	805	740	775
25	487	427	457	639	612	626	628	578	610	797	735	749
26	449	431	441	612	597	604	672	630	654	833	738	786
27	523	440	482	640	612	626	701	674	688	780	732	755
28	456	356	396	681	603	642	735	686	709	753	670	705
29	437	417	428	599	451	525	753	719	736	707	684	694
30	425	390	418	466	432	449	753	799	748	717	707	712
31	421	379	399	---	---	---	764	740	752	746	717	736
MONTH	662	308	490	710	324	565	764	437	588	852	670	796
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH				APRIL			MAY	
1	782	761	772	802	791	796	819	808	814	657	622	645
2	794	774	784	811	802	807	816	802	809	696	657	675
3	802	778	788	818	802	810	819	797	809	712	666	689
4	813	712	771	838	824	831	816	805	809	707	666	694
5	712	691	699	824	811	818	816	794	809	739	683	711
6	732	712	719	821	805	813	816	802	809	714	702	708
7	740	714	729	819	808	814	816	805	811	715	709	712
8	745	724	734	822	811	816	811	802	805	720	715	718
9	764	740	752	816	805	810	808	800	804	730	719	724
10	785	764	774	819	808	814	802	786	794	756	721	738
11	794	751	772	830	818	824	791	783	787	758	735	746
12	751	679	711	843	829	836	794	780	787	765	735	750
13	710	679	692	835	815	825	797	786	791	800	760	780
14	746	703	719	830	821	826	797	791	793	790	650	720
15	714	653	683	822	800	811	801	791	796	650	564	607
16	653	628	635	811	797	805	811	797	805	564	533	548
17	645	626	635	818	802	810	855	775	812	636	564	600
18	639	624	629	816	802	809	775	508	642	705	688	696
19	686	641	667	839	811	825	508	444	475	688	670	679
20	710	684	696	846	819	832	444	317	380	715	700	708
21	740	707	723	819	803	811	334	320	327	708	700	704
22	756	738	745	810	803	806	356	310	333	705	695	700
23	778	748	764	819	804	812	394	357	381	695	680	688
24	793	767	780	809	798	804	394	354	374	735	576	656
25	797	780	785	808	797	802	354	287	320	576	507	542
26	800	791	797	811	789	804	304	282	288	574	472	523
27	800	789	794	811	797	805	355	305	332	574	439	506
28	800	786	790	812	800	806	423	356	385	698	574	636
29	---	---	---	816	805	811	537	423	476	648	631	640
30	---	---	---	822	813	817	620	539	582	659	640	650
31	---	---	---	822	813	817	---	---	---	726	713	720
MONTH	813	624	734	846	789	814	855	282	631	800	439	671



GUADALUPE RIVER BASIN  
08188800 GUADALUPE RIVER NEAR TIVOLI, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	772	740	756	780	735	758	774	726	750	852	839	846
2	788	748	768	750	745	748	769	744	756	861	846	854
3	773	729	751	766	750	758	774	756	765	855	846	850
4	770	751	760	770	766	768	776	751	764	855	849	851
5	778	769	774	766	730	748	798	765	782	864	852	859
6	797	729	763	751	735	747	793	764	778	858	836	849
7	775	753	764	758	719	741	796	785	790	858	822	840
8	789	775	782	799	754	776	793	776	784	822	805	814
9	785	770	778	792	742	767	813	779	796	813	783	801
10	797	778	788	769	747	758	820	798	809	800	746	768
11	782	775	778	769	750	760	818	788	803	775	743	758
12	775	740	758	775	768	772	818	798	808	797	775	788
13	722	689	706	778	753	766	817	795	806	794	753	769
14	743	505	647	775	750	762	815	800	808	769	666	713
15	764	578	671	769	761	766	819	765	792	724	620	686
16	618	387	535	775	759	769	813	769	791	889	618	769
17	401	346	381	797	775	787	816	794	806	756	373	436
18	435	314	362	800	785	794	819	805	813	653	448	572
19	574	440	515	794	753	774	816	802	810	605	501	529
20	655	574	617	777	728	752	822	802	813	566	528	553
21	698	653	674	802	780	791	824	802	814	599	568	580
22	735	700	722	780	770	775	819	785	802	647	599	620
23	772	727	743	772	760	766	811	791	802	705	649	673
24	767	727	743	779	752	766	830	808	817	759	707	732
25	797	688	769	752	710	731	833	808	821	791	751	771
26	785	772	778	770	750	760	822	783	810	822	787	803
27	801	755	778	759	746	755	824	802	813	836	805	819
28	763	748	756	764	746	757	830	816	824	839	808	825
29	775	760	768	764	710	751	833	796	822	849	822	835
30	768	745	756	735	684	716	816	732	803	839	816	827
31	---	---	---	740	662	707	843	794	818	---	---	---
MONTH	801	314	705	802	662	760	843	726	799	889	373	746

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24.0	15.0	11.0	---	10.0	---	19.0	---	28.0	29.0	31.0	29.0
2	---	15.0	11.0	---	11.0	---	---	23.0	27.0	---	31.0	29.0
3	---	15.0	12.0	13.0	12.0	---	---	23.0	28.0	---	32.0	---
4	24.0	16.0	---	9.0	11.0	---	21.0	24.0	---	---	32.0	---
5	24.0	15.0	---	10.0	---	---	21.0	24.0	---	30.0	31.0	---
6	23.0	---	15.0	10.0	---	---	21.0	24.0	28.0	30.0	---	30.0
7	23.0	---	12.0	10.0	12.0	---	21.0	---	28.0	29.0	---	31.0
8	21.0	17.0	13.0	---	12.0	---	---	---	29.0	30.0	31.0	30.0
9	---	18.0	13.0	---	12.0	---	---	24.0	29.0	---	31.0	30.0
10	---	19.0	14.0	9.0	14.0	---	---	24.0	29.0	---	31.0	---
11	20.0	19.0	---	9.0	15.0	---	22.0	24.0	---	29.0	30.0	---
12	21.0	16.0	---	10.0	---	---	22.0	24.0	---	30.0	31.0	30.0
13	22.0	---	12.0	11.0	---	---	23.0	25.0	28.0	30.0	---	29.0
14	22.0	---	12.0	10.0	16.0	---	23.0	---	28.0	30.0	---	28.0
15	22.0	13.0	12.0	---	14.0	---	23.0	---	26.0	30.0	31.0	29.0
16	---	12.0	13.0	---	14.0	---	---	25.0	26.0	---	31.0	29.0
17	---	12.0	13.0	9.0	14.0	---	---	25.0	27.0	---	31.0	---
18	20.0	12.0	---	8.0	15.0	---	21.0	25.0	---	28.0	31.0	---
19	19.0	12.0	---	8.0	---	---	21.0	25.0	---	29.0	31.0	28.0
20	17.0	---	13.0	9.0	---	---	22.0	25.0	28.0	28.0	---	28.0
21	17.0	---	12.0	11.0	16.0	---	22.0	---	29.0	30.0	---	29.0
22	17.0	14.0	13.0	---	18.0	---	22.0	---	29.0	30.0	31.0	29.0
23	---	14.0	---	---	18.0	---	---	25.0	29.0	---	31.0	29.0
24	---	14.0	---	12.0	17.0	---	---	25.0	28.0	---	31.0	---
25	18.0	---	---	12.0	18.0	---	22.0	25.0	---	32.0	31.0	---
26	18.0	16.0	---	13.0	---	---	22.0	25.0	---	33.0	31.0	30.0
27	18.0	---	12.0	14.0	---	---	22.0	26.0	28.0	33.0	---	29.0
28	15.0	---	13.0	16.0	17.0	---	22.0	---	28.0	32.0	---	29.0
29	15.0	10.0	13.0	---	---	---	23.0	---	29.0	32.0	30.0	29.0
30	---	10.0	14.0	---	---	---	---	---	29.0	---	30.0	29.0
31	---	---	---	10.0	---	---	---	27.0	---	---	30.0	---
MEAN	20.0	14.5	12.5	10.5	14.5	---	22.0	24.5	28.0	30.0	31.0	29.0

LOCATION.--Lat 28°19'00", long 97°00'24", Refugio County, Hydrologic Unit 12100406, at culvert on Farm Road 774 and 16.4 mi (26.4 km) east of Refugio.

PERIOD OF RECORD.--Periodic discharge measurements: September 1967 to July 1968, June 1970 to current year. Periodic water-quality data: September 1971 to September 1977 (discontinued).

DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

[illegible][illegible][illegible]

## SALT CREEK BASIN

08189100 SALT CREEK NEAR REFUGIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

				DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)			
DATE	TIME											
NOV 18...	1625			1	0	0	0	3	90			
				DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)			
DATE	TIME											
NOV 18...				0	8	.0	0	0	4			
		PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)	
NOV 18...	1625	.0	0	.00	.00	.0	.0	0	.00	.0	.00	
		DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
NOV 18...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
		LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)	
NOV 18...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00

## COPANO CREEK BASIN

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08189200 COPANO CREEK NEAR REFUGIO, TX

LOCATION.--Lat 28°18'12", long 97°06'44", Refugio County, Hydrologic Unit 12100405, on right bank at bridge on Farm Road 774, 3.6 mi (5.8 km) upstream from Alameda Creek, 8.1 mi (13.0 km) east of Refugio, and 11.9 mi (19.1 km) upstream from mouth.

DRAINAGE AREA.--87.8 mi<sup>2</sup> (227 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1970 to current year.

GAGE.--Water-stage recorder. Datum of gage is 17.25 ft (5.258 m) above mean sea level.

REMARKS.--Water-discharge records good. No known diversion above station. Recording rain gage is located at station.

AVERAGE DISCHARGE.--7 years, 50.0 ft<sup>3</sup>/s (1.416 m<sup>3</sup>/s), 36,220 acre-ft/yr (44.7 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,300 ft<sup>3</sup>/s (178 m<sup>3</sup>/s) Sept. 12, 1971, gage height, 21.00 ft (6.401 m), from rating curve extended above 3,800 ft<sup>3</sup>/s (108 m<sup>3</sup>/s); no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1921, 22 ft (6.7 m) in September 1967, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 797 ft<sup>3</sup>/s (22.6 m<sup>3</sup>/s) Dec. 21, gage height, 11.44 ft (3.487 m), no other peak above base of 500 ft<sup>3</sup>/s (14.2 m<sup>3</sup>/s); no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	113	130	50	20	2.0	.03	29	15	7.3	.00	.00
2	2.9	114	112	46	35	1.6	.03	25	16	6.1	.00	.00
3	2.9	115	98	59	72	1.3	.03	17	23	5.2	.00	.00
4	2.9	114	84	55	83	1.5	.03	21	26	4.4	.00	.00
5	15	107	76	47	65	1.7	.03	26	23	3.8	.00	.00
6	19	88	110	40	53	1.3	.01	27	26	3.3	.00	.00
7	32	66	133	39	47	1.2	.01	22	28	2.8	.00	.00
8	26	47	112	38	39	1.2	.01	14	26	2.8	.00	.00
9	21	33	96	34	30	1.0	.01	38	18	2.4	.00	.00
10	14	20	86	27	25	.84	.00	57	12	1.8	.00	.00
11	9.5	12	93	20	62	.68	.00	44	9.5	1.5	.00	.00
12	6.2	9.1	143	17	104	.53	.00	30	8.7	1.2	.00	.00
13	3.6	8.3	238	27	95	.44	.00	19	7.7	.96	.00	.00
14	3.4	7.9	272	79	84	.35	.00	13	6.3	.76	.00	.00
15	2.5	7.0	307	91	78	.29	.00	9.8	16	.57	.00	.00
16	2.8	6.2	279	78	68	.25	2.0	8.7	43	.32	.00	.00
17	15	6.0	251	62	56	.19	8.1	9.8	64	.13	.00	.00
18	35	7.7	216	52	43	.13	9.5	9.9	66	1.2	.00	.00
19	31	99	363	43	30	.10	12	8.7	78	1.7	.00	.00
20	17	273	732	32	19	.06	14	7.3	94	1.7	.00	.00
21	11	255	770	22	14	.05	26	74	105	1.8	.00	.00
22	12	226	615	18	12	.05	27	195	112	1.3	.00	.00
23	12	192	468	29	9.2	.03	21	121	115	.94	.00	.00
24	12	170	374	42	7.4	.03	19	84	106	.69	.00	.00
25	15	155	305	43	5.7	.03	20	69	75	.21	.00	.00
26	19	139	253	38	4.3	.03	15	76	44	.01	.00	.00
27	23	118	194	35	3.3	.04	10	85	22	.00	.00	.00
28	31	123	150	31	2.5	.02	8.2	78	16	.00	.00	.00
29	65	173	113	23	---	.03	6.3	59	12	.00	.00	.00
30	113	156	86	17	---	.03	7.5	41	9.0	.00	.00	.00
31	113	---	67	15	---	.03	---	26	---	.00	.00	---
TOTAL	691.2	2960.2	7326	1249	1166.4	17.03	205.79	1344.2	1222.2	54.89	.00	.00
MEAN	22.3	98.7	236	40.3	41.7	.55	6.86	43.4	40.7	1.77	.000	.000
MAX	113	273	770	91	104	2.0	27	195	115	7.3	.00	.00
MIN	2.5	6.0	67	15	2.5	.02	.00	7.3	6.3	.00	.00	.00
AC-FT	1370	5870	14530	2480	2310	34	408	2670	2420	109	.00	.00
CAL YR 1976	TOTAL	17489.37	MEAN	47.8	MAX	770	MIN	.00	AC-FT	34690		
WTR YR 1977	TOTAL	16236.91	MEAN	44.5	MAX	770	MIN	.00	AC-FT	32210		

## COPANO CREEK BASIN

08189200 COPANO CREEK NEAR REFUGIO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: June 1970 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	HARD- NESS (CA, MG)
OCT 14...	1220	3.7	241	7.0	23.0	95	7.6	90	2.1	34
NOV 18...	1500	7.4	264	7.1	12.0	130	10.2	98	2.4	44
JAN 04...	1445	55	124	6.9	10.0	110	11.8	108	2.8	31
FEB 16...	1130	77	147	6.6	11.5	130	9.0	85	3.4	32
MAR 29...	1430	.06	828	7.1	24.0	120	5.4	66	3.7	150
MAY 10...	1805	60	156	6.6	27.0	110	5.8	73	4.7	31
JUN 21...	1510	110	92	6.6	30.5	65	4.7	63	2.8	34
DATE	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
OCT 14...	0	10	2.2	32	2.4	6.8	60	0	15	34
NOV 18...	0	13	2.9	34	2.2	5.8	56	0	19	42
JAN 04...	0	9.1	1.9	13	1.0	4.7	45	0	6.8	14
FEB 16...	0	9.0	2.4	17	1.3	4.8	43	0	6.4	20
MAR 29...	15	47	8.0	130	4.6	7.8	165	0	66	140
MAY 10...	0	9.6	1.8	19	1.5	4.9	48	0	11	23
JUN 21...	0	11	1.5	10	.8	3.5	42	0	5.0	8.3
DATE	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 14...	.6	15	145	178	.00	.02	.05	1.4	.13	12
NOV 18...	.2	15	160	240	.03	.02	.03	1.3	.11	4.9
JAN 04...	.1	12	84	180	.06	.01	.05	1.5	.12	13
FEB 16...	.1	10	91	232	.00	.01	.04	1.5	.09	16
MAR 29...	.2	14	495	210	.02	.01	.10	1.9	.22	--
MAY 10...	.1	13	106	184	.05	.01	.05	1.9	.12	28
JUN 21...	.1	17	77	98	.02	.00	.04	1.3	.21	25

## COPANO CREEK BASIN

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08189200 COPANO CREEK NEAR REFUGIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
NOV 18...	1500	3	100	0	0	3	240
MAR 29...	1430	3	200	0	2	5	60

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
NOV 18...	0	10	.0	0	0	20
MAR 29...	0	90	.4	0	0	20

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
NOV 18...	1500	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.3
MAR 29...	1430	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.2

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
NOV 18...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
MAR 29...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 18...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
MAR 29...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00



## MISSION RIVER BASIN

08189300 MEDIO CREEK NEAR BEEVILLE, TX

LOCATION.--Lat 28°28'58", long 97°39'23", Bee County, Hydrologic Unit 12100406, on left bank at downstream side of bridge on U.S. Highway 59, 8 mi (13 km) northeast of Beeville, and 9 mi (14 km) upstream from Parker Hollow Creek.

DRAINAGE AREA.--204 mi<sup>2</sup> (528 km<sup>2</sup>).

PERIOD OF RECORD.--March 1962 to October 1977 (discontinued).

REMARKS.--Records good. Several observations of water temperature were made during the year.

GAGE.--Water-stage recorder. Concrete control since Aug. 27, 1976. Datum of gage is 163.00 ft (49.682 m) above mean sea level.

AVERAGE DISCHARGE.--15 years, 19.9 ft<sup>3</sup>/s (0.564 m<sup>3</sup>/s), 1.32 in/yr (34 mm/yr), 14,420 acre-ft/yr (17.8 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 105,000 ft<sup>3</sup>/s (2,970 m<sup>3</sup>/s) Sept. 22, 1967, gage height, 38.68 ft (11.790 m), from flood-mark, from rating curve extended above 30,000 ft<sup>3</sup>/s (850 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1914, that of Sept. 22, 1967. A stage of about 31 ft (9.4 m), discharge 25,500 ft<sup>3</sup>/s (722 m<sup>3</sup>/s), occurred in September 1919, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft<sup>3</sup>/s (14.2 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)	Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)
Oct. 16	1800	864	24.5	10.45	3.185	Apr. 21	1100	906	25.7	10.14	3.091
Oct. 29	2300	504	14.3	9.35	2.850	June 16	0800	1,100	31.2	10.66	3.249
Apr. 16	1900	*3,240	91.8	14.75	4.496						

Minimum discharge, 0.03 ft<sup>3</sup>/s (0.001 m<sup>3</sup>/s) for several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	21	16	4.9	5.0	3.0	2.7	11	3.6	3.7	.29	.06
2	6.1	13	11	4.8	5.1	3.0	2.9	25	3.5	3.4	.25	.06
3	4.3	9.9	8.3	4.7	7.1	3.1	2.7	14	3.0	3.2	.21	.06
4	3.1	7.5	6.8	4.6	11	3.0	2.4	9.0	2.8	2.9	.20	.06
5	7.1	5.7	6.4	4.6	12	2.7	2.1	7.7	2.4	2.6	.19	.06
6	70	5.1	6.4	4.5	8.6	2.4	1.8	6.8	2.4	2.4	.20	.06
7	17	4.4	6.4	4.4	6.7	2.2	1.6	6.3	2.0	2.4	.19	.06
8	8.6	4.1	6.1	4.4	5.5	2.2	1.5	5.9	2.0	2.1	.20	.06
9	5.5	3.5	6.1	4.3	4.6	2.2	1.7	6.1	2.0	2.0	.20	.06
10	4.0	2.8	5.7	3.9	5.1	2.8	1.5	5.3	2.1	1.9	.18	.06
11	2.4	2.8	5.4	3.9	7.9	3.0	1.4	5.1	1.8	1.8	.16	.04
12	1.6	2.1	5.7	4.6	62	2.9	1.2	64	1.9	1.7	.18	.03
13	.89	2.5	5.7	5.6	33	2.9	2.1	43	1.6	1.6	.18	.10
14	.56	2.5	8.3	27	16	2.8	2.5	16	1.6	1.6	.17	.20
15	1.1	2.5	51	32	9.8	2.7	2.0	9.0	8.1	1.7	.17	.09
16	339	1.8	33	16	8.2	3.0	1290	7.3	598	1.9	.19	.06
17	125	1.8	17	11	7.1	3.0	1250	6.3	61	1.7	.19	.06
18	27	2.1	12	8.0	6.3	3.0	77	5.5	28	1.7	.29	.06
19	14	4.4	17	6.8	5.9	3.0	42	5.0	17	1.7	.22	.06
20	12	6.4	127	5.8	5.3	3.0	32	4.4	11	1.6	.15	.06
21	8.3	10	59	4.6	5.0	2.6	408	4.1	8.7	1.5	.11	.06
22	6.1	8.7	19	4.9	4.6	2.4	63	5.0	7.8	1.2	.09	.06
23	5.1	6.6	11	11	4.5	2.4	33	4.9	8.2	1.2	.07	.06
24	4.4	5.4	8.1	37	3.9	2.7	22	30	10	.81	.06	.06
25	4.4	5.4	7.1	22	3.9	2.7	16	81	16	.70	.06	.06
26	33	34	6.4	13	3.6	2.4	13	29	9.6	.67	.06	.06
27	16	45	14	9.7	3.6	2.4	11	13	7.2	.56	.04	.04
28	30	18	11	7.6	3.3	2.3	9.6	8.6	5.9	.51	.04	.03
29	243	37	7.9	6.4	---	2.3	8.8	6.5	4.7	.47	.06	.03
30	262	32	6.5	5.4	---	2.3	9.3	5.3	4.2	.39	.06	.03
31	44	---	5.8	5.1	---	2.6	---	4.5	---	.35	.06	---
TOTAL	1316.55	308.0	517.1	292.5	264.6	83.0	3314.8	454.6	838.1	51.96	4.72	1.85
MEAN	42.5	10.3	16.7	9.44	9.45	2.68	110	14.7	27.9	1.68	.15	.062
MAX	339	45	127	37	62	3.1	1290	81	598	3.7	.29	.20
MIN	.56	1.8	5.4	3.9	3.3	2.2	1.2	4.1	1.6	.35	.04	.03
CFSM	.21	.05	.08	.05	.05	.01	.54	.07	.14	.008	.001	.000
IN.	.24	.06	.09	.05	.05	.02	.60	.08	.15	.01	.00	.00
AC-FT	2610	611	1030	580	525	165	6570	902	1660	103	9.4	3.7
CAL YR 1976	TOTAL	7495.48	MEAN	20.5	MAX	1300	MIN	.00	CFSM	.10	IN	1.37
WTR YR 1977	TOTAL	7447.78	MEAN	20.4	MAX	1290	MIN	.03	CFSM	.10	IN	1.36
									AC-FT	14870		
									AC-FT	14770		

## 08189500 MISSION RIVER AT REFUGIO, TX

LOCATION.--Lat 28°17'30", long 97°16'44", Refugio County, Hydrologic Unit 12100406, on left bank at upstream side of upstream bridge of two bridges on U.S. Highway 77, 560 ft (171 m) upstream from Missouri Pacific Railroad Co. bridge, and 0.2 mi (0.3 km) southwest of Refugio.

DRAINAGE AREA.--690 mi<sup>2</sup> (1,787 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1939 to current year.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1.00 ft (0.305 m) above mean sea level. Prior to Nov. 25, 1958, nonrecording gage at site 59 ft (18 m) downstream at same datum. Nov. 26, 1958, to Apr. 18, 1963, nonrecording gage at present site and datum.

REMARKS.--Water-discharge records good. Several small diversions above station.

AVERAGE DISCHARGE.--38 years (water years 1940-77), 116 ft<sup>3</sup>/s (3.285 m<sup>3</sup>/s), 2.28 in/yr (58 mm/yr), 84,040 acre-ft/yr (104 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 79,000 ft<sup>3</sup>/s (2,240 m<sup>3</sup>/s) Sept. 12, 1971, gage height, 38.25 ft (11.659 m); minimum observed, 0.7 ft<sup>3</sup>/s (0.02 m<sup>3</sup>/s) Oct. 7, 9, 1940, Aug. 18-20, Sept. 5, 1945, Dec. 29, 31, 1949, Jan. 1, 1950, July 13, Aug. 28, 1963, July 18, 19, 22-26, 31, Aug. 1, 2, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1899, that of Sept. 12, 1971. Flood of Sept. 21, 1967, reached a stage of 36.5 ft (11.13 m), discharge 60,200 ft<sup>3</sup>/s (1,700 m<sup>3</sup>/s). Flood of July 7, 1942, reached a stage of 33.3 ft (10.15 m), discharge 41,700 ft<sup>3</sup>/s (1,180 m<sup>3</sup>/s). Floods in August 1914 and May 17, 1938, reached a stage of 32.3 ft (9.85 m), from information by local residents. Flood of May 13, 1972, reached a stage of 28.25 ft (8.611 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)	Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)
Oct. 17	1600	1,970	55.8	14.88	4.535	Apr. 18	0300	2,510	71.1	16.74	5.102
Oct. 30	1700	4,060	115	21.20	6.462	May 1	unknown	1,220	34.6	12.00	3.658
Nov. 20	1300	1,820	51.5	14.36	4.377	May 9	unknown	1,220	34.6	12.00	3.658
Dec. 13	1900	1,870	53.0	14.55	4.435	May 12	2400	1,740	49.3	14.05	4.282
Dec. 15	1200	2,220	62.9	15.74	4.798	May 25	1600	1,320	37.4	12.43	3.789
Dec. 20	1900	*4,560	129	22.28	6.791	June 17	0900	4,550	129	22.25	6.782
Feb. 12	0500	1,280	36.2	12.27	3.740						

Minimum discharge, 11 ft<sup>3</sup>/s (0.31 m<sup>3</sup>/s) Sept. 28-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	647	252	91	72	54	43	1060	72	64	24	19
2	46	285	169	107	81	53	44	560	136	59	24	28
3	37	188	124	119	210	62	45	244	165	55	24	18
4	32	139	96	111	456	69	43	143	99	53	23	17
5	118	109	101	99	229	59	40	96	65	50	22	16
6	639	91	417	90	139	53	37	74	53	47	22	16
7	399	80	588	84	102	52	36	69	48	45	22	16
8	166	71	258	79	83	49	36	78	45	45	22	18
9	97	64	148	75	74	49	35	789	43	42	22	17
10	69	60	105	71	86	50	35	884	43	40	21	17
11	52	57	88	66	795	50	35	478	66	38	21	16
12	42	54	173	67	1150	50	34	981	120	37	20	16
13	38	54	1380	134	567	49	38	1240	428	35	21	16
14	35	57	1480	605	283	47	42	444	169	34	21	18
15	34	53	2010	454	174	47	41	211	279	33	20	21
16	359	51	978	248	123	47	117	141	2840	36	19	21
17	1820	50	395	161	99	49	964	109	4160	41	19	17
18	820	57	230	114	87	48	1770	92	1440	37	18	15
19	255	467	1130	92	80	47	307	80	358	36	18	14
20	230	1660	4160	82	74	45	172	72	213	34	18	13
21	284	945	3130	75	69	44	428	144	157	33	18	13
22	135	358	977	76	67	43	700	771	132	31	18	12
23	88	192	420	117	66	42	230	604	116	29	17	12
24	72	131	267	242	64	42	138	334	120	28	17	13
25	69	107	208	187	60	46	102	1020	165	28	17	12
26	241	108	199	143	59	49	86	692	125	27	16	12
27	154	170	200	111	56	49	70	275	108	26	16	12
28	217	312	152	92	53	48	63	156	96	27	18	11
29	1440	594	131	78	---	49	57	110	80	26	18	11
30	3790	433	114	69	---	46	441	87	70	25	18	11
31	2470	---	102	68	---	45	---	73	---	25	18	---
TOTAL	14308	7644	20182	4207	5458	1532	6229	12111	12011	1166	612	468
MEAN	462	255	651	136	195	49.4	208	391	400	37.6	19.7	15.6
MAX	3790	1660	4160	605	1150	69	1770	1240	4160	64	24	28
MIN	32	50	88	66	53	42	34	69	43	25	16	11
CFSM	.67	.37	.94	.20	.28	.07	.30	.57	.58	.05	.03	.02
IN.	.77	.41	1.09	.23	.29	.08	.34	.65	.65	.06	.03	.03
AC-FT	28380	15160	40030	8340	10830	3040	12360	24020	23820	2310	1210	928
CAL YR 1976	TOTAL	103454.9	MEAN	283	MAX	9270	MIN	8.0	CFSM	.41	IN	5.58
WTR YR 1977	TOTAL	85928.0	MEAN	235	MAX	4160	MIN	11	CFSM	.34	IN	4.63
										AC-FT	205200	
										AC-FT	170400	

## MISSION RIVER BASIN

08189500 MISSION RIVER AT REFUGIO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: September 1961 to current year. Chemical and biochemical analyses: January 1968 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: September 1961 to current year.

WATER TEMPERATURES: September 1961 to current year.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 100,000 micromhos Nov. 28, 1965; minimum daily, 85 micromhos Sept. 13, 1971.

WATER TEMPERATURES: Maximum daily, 37.0°C May 12, 1967; minimum daily, 0.0°C Jan. 18, 1977.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 3,810 micromhos Sept. 30; minimum daily, 142 micromhos May 25.

WATER TEMPERATURES: Maximum daily, 32.0°C Aug. 2.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIO-CHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA+MG) (MG/L)
OCT 27...	1600	133	507	7.4	17.0	--	--	--	--	--	100
NOV 18...	1440	57	1750	7.6	13.5	50	150	8.5	84	5.2	300
JAN 13...	1645	154	1160	7.5	14.0	55	55	9.1	91	2.4	270
MAR 17...	1505	49	2120	7.9	23.5	5	15	9.0	108	1.2	430
APR 13...	1323	34	2260	8.2	23.5	--	--	--	--	--	430
MAY 12...	1530	1280	430	7.3	25.5	280	110	6.3	79	2.3	110
JUN 17...	0930	4540	234	7.8	26.5	--	--	--	--	--	72
JUL 14...	1450	34	2010	7.8	29.5	0	15	8.1	107	1.9	410
SEP 08...	1330	17	2740	8.0	28.5	--	--	--	--	--	420

DATE	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 27...	22	34	4.6	64	2.7	4.3	100	0	7.8	99	.2
NOV 18...	88	97	15	250	6.2	4.6	263	0	24	420	.1
JAN 13...	72	86	13	140	3.7	4.5	240	0	25	260	.3
MAR 17...	150	130	25	280	5.9	4.4	336	0	53	520	.3
APR 13...	170	130	25	310	6.5	4.2	320	0	53	560	.3
MAY 12...	33	35	5.9	37	1.5	4.6	96	0	18	71	.1
JUN 17...	3	26	1.7	16	.8	2.8	84	0	3.9	26	.1
JUL 14...	120	130	21	260	5.6	3.9	350	0	41	450	.4
SEP 08...	190	120	28	430	9.2	4.8	270	0	45	760	.3

## MISSION RIVER BASIN

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08189500 MISSION RIVER AT REFUGIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS- SOLVED SILICA (SIO <sub>2</sub> ) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 27...	14	277	--	--	--	--	--	--	--	--
NOV 18...	27	967	420	76	.15	.01	.10	2.0	.11	16
JAN 13...	25	673	137	31	.24	.01	.07	.93	.05	7.1
MAR 17...	36	1220	35	9	1.9	.04	.08	.45	.03	4.2
APR 13...	36	1280	--	--	--	--	--	--	--	--
MAY 12...	14	233	240	0	.20	.01	.08	1.3	.08	15
JUN 17...	11	129	--	--	--	--	--	--	--	--
JUL 14...	44	1120	31	6	.03	.00	.01	.32	.01	3.5
SEP 08...	44	1570	--	--	--	--	--	--	--	--

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
JAN 13...	1645	7	400	1	1	0	150
MAR 17...	1505	7	700	0	0	0	10
MAY 12...	1530	3	200	0	0	1	80
JUL 14...	1450	9	300	0	0	1	40

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
JAN 13...	5	100	.0	1	0	10
MAR 17...	0	110	.0	0	0	0
MAY 12...	0	4	.0	0	0	10
JUL 14...	0	100	.0	0	0	2

## MISSION RIVER BASIN

08189500 MISSION RIVER AT REFUGIO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
JAN 13...	1645	.0	0	.00	.00	.0	.0	6	.00	1.4	.00	.7
MAR 17...	1505	.0	0	.00	.00	.0	.0	2	.00	.4	.00	.3
MAY 12...	1530	.0	--	.00	.00	--	.0	--	.00	--	.00	--
JUL 14...	1450	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.1

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
JAN 13...	.00	.4	.00	.00	.1	.00	.0	.00	.00	.0	.00	.0
MAR 17...	.00	.9	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0
MAY 12...	.00	--	.00	.00	--	.00	--	.00	.00	--	.00	--
JUL 14...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
JAN 13...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00
MAR 17...	.00	.0	.01	.00	.00	.00	0	0	.00	.00	.00	.00
MAY 12...	.00	--	.00	.00	.00	.00	0	--	.00	.00	.00	.00
JUL 14...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	14308	292	160	6200	41	1580	4	138	82
NOV. 1976.....	7644	508	280	5770	95	1950	7	151	130
DEC. 1976.....	20182	340	190	10200	52	2820	5	252	91
JAN. 1977.....	4207	1110	610	6940	250	2890	17	189	220
FEB. 1977.....	5458	843	460	6830	180	2690	13	188	180
MAR. 1977.....	1532	2090	1150	4750	530	2190	29	120	380
APR. 1977.....	6229	792	430	7270	170	2850	12	202	170
MAY 1977.....	12111	439	240	7870	76	2490	7	215	110
JUNE 1977.....	12011	445	240	7910	80	2580	6	197	110
JULY 1977.....	1166	1980	1090	3420	500	1570	28	87	360
AUG. 1977.....	612	2510	1380	2280	650	1070	34	57	450
SEPT 1977.....	468	2880	1590	2000	750	952	39	49	510
TOTAL .....	85928	**	**	71400	**	25600	**	1840	**
WTD.AVG. ....	235.42	561	310	**	110	**	8.2	**	140

08189500 MISSION RIVER AT REFUGIO, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1040	229	495	1560	1850	1930	2270	234	1560	1880	2240	2660
2	1320	385	705	1420	1710	1960	2230	237	600	1680	2270	3170
3	1570	555	912	1250	1180	1900	2250	469	540	1840	2440	2980
4	1810	768	1090	1400	490	1880	2180	742	991	1870	2220	2950
5	1120	987	1050	1390	620	1900	2270	1060	1310	1670	2470	2930
6	347	1150	528	1460	966	1960	2240	1290	1610	1930	2440	2970
7	355	1280	242	1600	1260	2040	2320	1490	1890	1870	2290	2810
8	361	1340	432	1650	1550	2000	2380	1560	1920	1760	2270	2830
9	599	1520	627	1750	1690	2030	2410	268	1990	1820	2470	2810
10	910	1550	935	1770	1780	2050	2450	327	2030	1960	2530	2850
11	1240	1620	1090	1780	576	2080	2360	386	1840	1980	2680	2610
12	1470	1640	958	2060	278	2100	2410	519	1150	2020	2550	3020
13	1700	1660	356	1160	458	2070	2250	300	245	2030	2470	3150
14	1920	1690	225	544	614	2100	2180	513	437	2040	2440	2590
15	2150	1710	220	498	958	2150	2240	700	319	1980	2220	1800
16	1110	1690	257	710	1230	2190	1200	935	220	1960	2430	2140
17	175	1740	365	926	1480	2210	700	1120	236	1910	2460	2470
18	224	1960	479	1130	1640	2150	390	1240	300	2080	2570	2580
19	312	691	450	1400	1790	2100	881	1400	428	1970	2330	2640
20	385	220	163	1570	1820	2190	910	1540	783	1960	2700	2800
21	284	242	149	1590	1830	2100	301	1220	1110	2010	2650	3160
22	473	291	347	1620	1850	2260	500	278	1210	2040	2700	3150
23	824	455	515	1420	1940	2210	640	363	1520	2240	2730	3240
24	982	667	735	716	1850	2390	793	479	1340	2090	2700	3400
25	1140	770	954	855	1920	2210	1050	142	1110	2220	2870	3270
26	339	872	884	1200	1990	2150	1280	294	1140	2260	2830	3260
27	507	750	824	1490	2010	2100	1420	717	1340	2270	2600	3300
28	521	610	1080	1590	2030	2030	1560	802	1500	2290	2610	3260
29	181	393	1230	1680	---	2140	1620	1010	1710	2300	2630	3520
30	149	339	1390	1870	---	2230	950	1160	1850	2270	2480	3810
31	160	---	1550	1900	---	2240	---	1420	---	2380	2870	---
MEAN	828	992	685	1390	1410	2100	1620	781	1140	2020	2520	2940

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25.5	14.5	8.0	---	11.0	18.0	18.0	20.0	29.5	28.0	31.0	26.5
2	24.5	16.5	10.5	8.0	10.5	19.0	23.5	20.5	27.0	29.5	32.0	26.5
3	---	18.0	12.0	8.0	12.0	---	24.5	26.0	---	27.0	28.5	27.0
4	23.5	19.0	13.0	11.5	13.5	18.5	23.5	26.5	29.0	28.0	31.5	---
5	22.0	18.5	---	11.0	---	16.0	21.5	25.5	26.5	28.0	28.5	30.5
6	20.5	20.0	16.0	10.5	11.0	15.5	21.5	24.5	30.0	30.0	28.0	29.5
7	---	19.0	12.0	10.0	14.0	16.0	22.0	26.0	30.5	30.0	31.5	26.5
8	19.0	19.5	12.0	13.5	14.5	18.5	23.0	24.0	29.5	28.0	31.0	28.5
9	18.0	19.0	11.5	11.5	13.0	18.0	---	22.0	30.0	31.0	28.0	29.5
10	---	25.0	15.0	9.0	15.0	19.0	21.0	23.5	30.5	26.5	27.0	28.5
11	25.5	20.0	13.5	11.0	15.5	19.5	24.0	25.5	28.5	27.0	29.0	27.0
12	21.0	15.5	12.0	11.5	16.0	18.0	23.5	24.5	26.5	28.0	---	30.5
13	20.5	---	10.5	---	16.5	18.5	24.5	26.0	26.5	---	28.5	27.0
14	---	---	11.0	12.0	15.5	21.0	24.0	26.0	28.5	27.0	28.0	28.5
15	23.5	11.0	11.5	11.5	13.5	21.0	---	25.0	25.0	30.0	30.5	29.0
16	23.0	11.0	14.5	---	15.0	20.0	23.0	25.0	25.5	28.5	31.5	---
17	---	10.5	---	10.0	16.5	21.0	22.0	25.0	26.5	26.5	31.0	29.5
18	20.0	12.0	14.5	0.0	15.5	21.5	18.5	25.5	---	25.5	28.5	28.0
19	18.0	12.0	18.0	10.5	16.5	22.0	21.5	---	28.0	29.0	26.5	31.0
20	18.0	10.5	14.0	11.5	18.0	20.0	23.5	25.5	29.5	28.0	27.0	27.0
21	16.0	16.5	11.5	13.0	18.5	23.5	24.0	---	28.5	---	29.0	25.5
22	18.0	14.0	9.0	---	19.0	23.0	23.5	23.5	28.5	28.0	29.0	26.0
23	21.0	15.0	10.5	14.0	18.5	18.5	24.5	24.5	26.5	28.0	29.0	30.0
24	20.5	15.5	---	14.5	20.0	20.0	22.0	25.5	26.5	28.0	29.0	27.0
25	19.5	---	13.5	14.0	18.0	21.5	22.0	26.0	---	27.0	28.5	28.5
26	19.5	19.0	14.5	13.5	20.0	21.0	25.0	26.0	28.0	28.0	28.0	28.0
27	18.0	---	13.0	15.0	16.0	21.0	24.5	28.0	28.0	28.5	29.0	27.0
28	15.5	---	15.0	18.5	19.0	23.0	24.5	28.0	29.5	28.5	---	26.0
29	13.0	7.0	14.5	13.5	---	---	---	27.0	28.0	30.0	27.0	29.0
30	12.0	8.5	---	12.0	---	22.0	---	28.0	29.5	31.0	26.5	30.0
31	---	---	11.0	9.5	---	20.0	---	27.0	---	29.5	27.0	---
MEAN	20.0	15.5	12.5	11.5	15.5	20.0	23.0	25.0	28.0	28.5	29.0	28.0



## ARANSAS RIVER BASIN

08189700 ARANSAS RIVER NEAR SKIDMORE, TX

LOCATION.--Lat 28°16'56", long 97°37'14", Bee County, Hydrologic Unit 12100407, on right bank 160 ft (49 m) downstream from centerline of county road bridge, 3.8 mi (6.1 km) downstream from confluence of West Aransas and Poesta Creeks, and 4.4 mi (7.1 km) northeast of Skidmore.

DRAINAGE AREA.--247 mi<sup>2</sup> (640 km<sup>2</sup>).

PERIOD OF RECORD.--March 1964 to current year.

Water-quality records: Chemical analyses: October 1965 to September 1966. Sediment records: February 1966 to September 1975.

GAGE.--Water-stage recorder. Datum of gage is 72.37 ft (22.058 m) above mean sea level.

REMARKS.--Records good. No known diversion. Chase Field Naval Air Station and city of Beeville discharge sewage effluent into the stream via Poesta Creek. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--13 years, 51.1 ft<sup>3</sup>/s (1.447 m<sup>3</sup>/s), 2.81 in/yr (71 mm/yr), 37,020 acre-ft/yr (45.6 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 82,800 ft<sup>3</sup>/s (2,340 m<sup>3</sup>/s) Sept. 22, 1967, gage height, 42.22 ft (12.869 m), from flood-mark, from rating curve extended above 14,000 ft<sup>3</sup>/s (396 m<sup>3</sup>/s) on basis of slope-area measurements of 29,600 and 82,800 ft<sup>3</sup>/s (838 and 2,340 m<sup>3</sup>/s); no flow at times in 1964-67, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1914, that of Sept. 22, 1967. Flood of September 1954 reached a stage of 33 ft (10.1 m), discharge 19,600 ft<sup>3</sup>/s (555 m<sup>3</sup>/s), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft<sup>3</sup>/s (14.2 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)				
Oct. 5	1900	840	23.8	11.08	3.377	Dec. 20	0100	*4,120	117	19.86	6.053
Oct. 16	1500	816	23.1	10.95	3.338	Apr. 17	0400	578	16.4	9.46	2.883
Oct. 29	1700	1,900	53.8	15.10	4.602	May 12	0500	2,060	58.3	15.54	4.737
Dec. 14	2100	560	15.9	9.31	2.838	June 16	0300	660	18.7	10.03	3.057

Minimum discharge, 2.7 ft<sup>3</sup>/s (0.076 m<sup>3</sup>/s) Sept. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	43	20	10	10	8.9	8.3	64	9.9	8.9	4.9	6.1
2	4.3	25	13	11	13	9.4	8.5	30	12	8.4	4.8	5.8
3	3.9	17	11	13	20	11	9.0	15	13	7.9	4.8	5.7
4	3.4	13	8.9	14	25	17	8.2	11	10	7.8	4.7	5.5
5	285	11	8.6	11	17	13	7.0	9.6	9.1	7.6	4.7	5.1
6	201	9.5	9.3	9.9	12	10	6.2	9.0	8.7	7.1	5.1	4.9
7	45	8.5	9.2	9.2	11	9.3	6.2	7.9	8.6	7.1	5.2	6.3
8	21	7.8	7.4	8.9	10	9.0	6.1	8.2	8.7	6.7	5.1	15
9	14	7.3	6.9	8.8	9.7	9.0	6.1	178	8.5	6.7	5.1	12
10	9.9	7.1	6.8	8.1	15	9.3	6.0	207	8.4	6.7	5.2	5.7
11	7.0	6.9	7.2	7.5	120	10	5.9	140	8.8	6.5	5.6	3.8
12	5.7	6.6	52	9.1	198	10	5.6	1170	9.3	5.9	5.8	3.3
13	5.3	6.7	140	74	58	8.9	6.1	159	9.2	5.9	5.9	3.9
14	4.8	7.8	282	105	29	8.8	6.6	54	8.6	6.2	6.2	5.7
15	6.8	7.6	277	48	18	9.1	6.9	31	44	6.6	6.2	15
16	410	6.4	69	26	14	9.8	17	22	305	7.8	5.8	6.6
17	156	6.5	33	16	12	10	299	18	41	7.7	6.0	5.2
18	44	7.9	21	13	12	10	56	16	18	9.9	5.9	4.7
19	21	81	1200	11	12	9.4	27	14	13	7.3	5.9	4.4
20	13	177	1640	10	12	8.6	19	13	11	6.6	5.9	4.4
21	9.1	58	148	9.8	11	9.0	28	13	9.7	6.4	5.8	4.4
22	6.9	25	58	13	10	8.5	24	14	9.6	6.0	5.8	4.3
23	5.8	15	37	42	11	8.1	14	14	59	5.8	5.8	4.1
24	5.7	11	28	40	11	8.7	11	15	215	5.8	6.2	4.2
25	6.1	11	24	24	9.8	9.7	9.8	35	75	5.6	5.9	4.0
26	7.4	26	22	16	10	12	8.8	25	34	5.3	5.5	3.5
27	6.4	30	18	13	9.5	10	8.3	14	18	5.4	5.3	3.5
28	18	45	14	12	8.7	9.9	8.2	11	13	5.5	5.8	3.2
29	1230	68	13	10	---	9.3	8.1	11	11	5.5	5.9	3.3
30	496	40	12	9.5	---	9.5	16	9.9	9.7	5.3	6.0	3.4
31	103	---	11	9.5	---	8.6	---	9.6	---	5.3	6.0	---
TOTAL	3161.1	792.6	4207.3	622.3	708.7	303.8	656.9	2348.2	1018.8	207.2	172.8	167.0
MEAN	102	26.4	136	20.1	25.3	9.80	21.9	75.7	34.0	6.68	5.57	5.57
MAX	1230	177	1640	105	198	17	299	1170	305	9.9	6.2	15
MIN	3.4	6.4	6.8	7.5	8.7	8.1	5.6	7.9	8.4	5.3	4.7	3.2
CFSM	.41	.11	.55	.08	.10	.04	.09	.31	.14	.03	.02	.02
IN.	.48	.12	.63	.09	.11	.05	.10	.35	.15	.03	.03	.03
AC-FT	6270	1570	8350	1230	1410	603	1300	4660	2020	411	343	331

CAL YR 1976	TOTAL	12582.5	MEAN 34.4	MAX 1640	MIN 1.2	CFSM .14	IN 1.90	AC-FT 24960
WTR YR 1977	TOTAL	14366.7	MEAN 39.4	MAX 1640	MIN 3.2	CFSM .16	IN 2.16	AC-FT 28500

## ARANSAS RIVER BASIN

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08189800 CHILTIPI CREEK AT SINTON, TX

LOCATION.--Lat 28°02'48", long 97°30'13", San Patricio County, Hydrologic Unit 12100407, on left bank at upstream end of bridge on U.S. Highway 77, 0.2 mi (0.3 km) upstream from Missouri Pacific Railroad bridge, and 0.8 mi (1.3 km) northeast of Sinton.

DRAINAGE AREA.--128 mi<sup>2</sup> (332 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1970 to current year.

REVISED RECORDS.--WDR TX-72-1: 1971(P).

GAGE.--Water-stage recorder. Datum of gage is 18.74 ft (5.712 m) above mean sea level.

REMARKS.--Water-discharge records good. No known diversions above station. An undetermined amount of water from oilfield operations enters stream upstream at various points. A recording rain gage is located at station.

AVERAGE DISCHARGE.--7 years, 55.7 ft<sup>3</sup>/s (1.577 m<sup>3</sup>/s), 5.91 in/yr (150 mm/yr), 40,350 acre-ft/yr (49.8 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,300 ft<sup>3</sup>/s (632 m<sup>3</sup>/s) Sept. 12, 1971, gage height, 29.10 ft (8.870 m), from rating curve extended above 13,400 ft<sup>3</sup>/s (379 m<sup>3</sup>/s); no flow for part of several days in 1973, 1975-76.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stages since 1910, 30.27 ft (9.226 m) Sept. 22, 1967, and 28.8 ft (8.78 m) in April 1930, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft<sup>3</sup>/s (17.0 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 6	0200	973	27.6	7.27	2.216	May 1	0300	*3,470	98.3	13.70	4.176
Oct. 29	2000	706	20.0	6.47	1.972	May 12	1300	899	25.5	7.05	2.149
Nov. 19	2400	1,510	42.8	8.68	2.646						

Minimum discharge, 0.01 ft<sup>3</sup>/s (0.0003 m<sup>3</sup>/s) for several days in June, July, and August.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.93	106	80	.79	5.2	.44	.40	2960	1.0	.02	.01	.35		
2	.52	66	49	14	20	.34	1.7	823	.52	.01	.01	.47		
3	.39	37	24	62	117	2.8	.66	188	.26	.01	.01	.19		
4	.44	21	13	44	93	1.4	.51	86	.57	.01	.01	.16		
5	501	12	19	19	43	.75	.58	36	.55	.01	.02	.16		
6	710	7.1	37	10	19	.66	.27	15	.23	.01	.03	.17		
7	244	4.8	32	5.3	8.7	.56	.22	6.5	.12	.01	.05	.18		
8	139	3.1	18	3.1	4.5	.54	.20	2.9	.05	.01	.18	33		
9	85	2.4	10	2.0	3.1	.59	.36	70	.03	.01	.05	44		
10	49	1.8	6.2	1.1	7.1	.68	.24	129	.02	.01	.04	9.8		
11	26	1.3	4.2	.75	67	.81	.27	97	.01	.01	.05	2.2		
12	13	1.6	35	30	106	.71	.26	726	.04	.01	.06	1.1		
13	5.8	1.5	178	302	45	.66	.27	418	.03	.01	.07	1.1		
14	2.3	.99	263	317	24	.70	.30	136	.02	.01	.08	15		
15	7.7	.75	323	165	11	.79	.31	46	4.2	.01	.09	12		
16	84	1.1	155	83	5.7	.88	.62	11	.49	.89	.08	3.5		
17	70	4.0	87	40	3.2	.84	174	3.5	.12	3.4	.09	1.4		
18	49	58	53	19	1.9	.94	101	1.7	.09	6.2	.10	.72		
19	30	780	145	8.7	1.4	1.4	59	.82	.07	3.4	.11	.44		
20	15	1060	368	4.7	.86	.88	36	.38	.07	1.6	.12	.32		
21	7.5	388	159	2.6	.58	1.1	26	75	.10	.55	.12	.25		
22	3.6	145	86	8.0	.45	1.5	18	383	.16	.18	.15	.23		
23	1.8	60	54	37	.39	1.5	13	155	3.9	.08	.15	.20		
24	1.9	23	30	41	.21	1.7	9.1	108	.56	.03	.16	.18		
25	3.1	11	19	20	.16	2.1	7.1	127	.40	.02	.16	.19		
26	.89	6.5	12	9.8	.26	1.4	5.8	73	.91	.01	.17	.20		
27	87	2.6	7.2	5.2	.15	1.5	5.1	38	.42	.01	.25	.21		
28	403	135	4.5	2.9	.21	9.7	4.7	16	.15	.01	.26	.24		
29	619	306	2.5	1.3	---	2.4	4.9	7.1	.11	.01	.19	.25		
30	480	137	1.8	1.1	---	.31	1150	3.5	.04	.01	.29	.27		
31	194	---	1.1	.83	---	.46	---	1.9	---	.01	.19	---		
TOTAL	3834.87	3384.54	2276.5	1261.17	589.07	41.04	1682.25	6744.30	15.24	16.57	3.35	128.48		
MEAN	124	113	73.4	40.7	21.0	1.32	56.1	218	.51	.53	.11	4.28		
MAX	710	1060	368	317	117	9.7	1150	2960	4.2	6.2	.29	.44		
MIN	.39	.75	1.1	.75	.15	.31	.20	.38	.01	.01	.01	.16		
CFSM	.97	.88	.57	.32	.16	.01	.44	1.70	.004	.004	.001	.03		
IN.	1.11	.98	.66	.37	.17	.01	.49	1.96	.00	.00	.00	.04		
AC-FT	7610	6710	4520	2500	1170	81	3340	13380	30	33	6.6	255		
CAL YR 1976	TOTAL	24399.72	MEAN	66.7	MAX	3660	MIN	.02	CFSM	.52	IN	7.09	AC-FT	48400
WTR YR 1977	TOTAL	19977.38	MEAN	54.7	MAX	2960	MIN	.01	CFSM	.43	IN	5.81	AC-FT	39630

## ARANSAS RIVER BASIN

08189800 CHILTIPI CREEK AT SINTON, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1968 to current year. Biochemical analyses: October 1969 to current year.  
Pesticide analyses: October 1969 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS-CHARGE (CFS)	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DIS-SOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIO-CHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	HARDNESS (CA, MG) (MG/L)
OCT 13...	1605	4.5	620	7.6	29.0	180	8.2	108	4.3	99
NOV 18...	1030	17	2320	7.6	12.0	150	10.6	102	3.6	360
JAN 04...	1040	47	405	7.2	9.0	350	12.0	107	3.4	54
FEB 16...	0930	5.6	1710	7.3	11.0	170	10.4	97	2.6	200
MAR 29...	1115	.30	28600	7.6	24.0	8	12.6	154	2.1	3700
MAY 10...	1435	127	230	7.0	29.0	300	7.4	97	5.9	47
JUN 21...	1130	.08	21000	7.6	32.0	3	9.0	123	2.3	2200
AUG 02...	1610	.01	5720	8.4	39.0	4	13.4	203	2.9	400
SEP 12...	1345	1.0	3930	7.9	34.0	10	8.0	113	3.6	440
DATE	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)
OCT 13...	24	30	5.9	78	3.4	11	92	0	14	140
NOV 18...	250	110	20	330	7.6	9.6	126	0	17	680
JAN 04...	17	16	3.3	54	3.2	4.7	44	0	6.3	97
FEB 16...	140	59	13	260	8.0	6.9	75	0	23	490
MAR 29...	3500	1100	220	5600	40	28	200	0	97	11000
MAY 10...	3	15	2.3	26	1.7	4.8	54	0	6.0	44
JUN 21...	1900	630	140	4100	38	20	310	0	100	7700
AUG 02...	230	110	31	1100	24	8.1	190	12	20	1900
SEP 12...	350	130	27	600	13	12	100	0	22	1200
DATE	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON-FILTERABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 13...	.3	20	345	332	.08	.01	.58	1.3	.62	11
NOV 18...	.3	14	1240	336	.23	.01	.10	1.3	.23	16
JAN 04...	.2	8.4	212	712	.28	.01	.12	1.1	.39	19
FEB 16...	.1	7.6	897	328	.21	.02	.11	1.7	.22	14
MAR 29...	.3	6.9	18200	22	.04	.01	.27	1.2	.12	--
MAY 10...	.1	13	138	216	.14	.02	.07	1.4	.53	18
JUN 21...	.7	8.9	12900	20	.01	.00	.05	.69	.07	17
AUG 02...	.8	16	3290	9	.00	.01	.00	1.9	.04	12
SEP 12...	.2	22	2060	32	.07	.02	.04	.84	.40	14

## ARANSAS RIVER BASIN

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08189800 CHILTIPI CREEK AT SINTON, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
NOV 18...	1030	19	--	0	0	3	40
MAR 29...	1115	0	10000	6	1	3	50
AUG 02...	1610	15	1400	0	0	4	70

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
NOV 18...	0	440	.0	0	0	0
MAR 29...	0	3900	.4	0	0	40
AUG 02...	0	80	.0	0	0	10

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
NOV 18...	1030	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0
MAR 29...	1115	.2	6	.00	.00	.0	.0	2	.00	.7	.00	.0
AUG 02...	1610	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
NOV 18...	.00	.0	.01	.00	.0	.00	.0	.00	.00	.0	.00	.0
MAR 29...	.00	.2	.01	.00	.2	.00	.0	.00	.00	.0	.00	.0
AUG 02...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 18...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.02	.00
MAR 29...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.13	.00
AUG 02...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00

## NUECES RIVER BASIN

08190000 NUECES RIVER AT LAGUNA, TX

LOCATION.--Lat 29°25'42", long 99°59'49", Uvalde County, Hydrologic Unit 12110101, on right bank 0.5 mi (0.8 km) downstream from Sycamore Creek, 1.0 mi (1.6 km) northeast of Laguna, and at mile 395.4 (636.2 km).

DRAINAGE AREA.--764 mi<sup>2</sup> (1,979 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1923 to current year.

REVISED RECORDS.--WSP 1562: 1930, 1931(M), 1932, 1939.

GAGE.--Water-stage recorder. Datum of gage is 1,119.72 ft (341.291 m) above mean sea level. Prior to Jan. 26, 1925, nonrecording gage at site 2 mi (3 km) downstream at different datum.

REMARKS.--Water-discharge records good. Many small diversions above station for irrigation.

AVERAGE DISCHARGE.--54 years, 151 ft<sup>3</sup>/s (4.276 m<sup>3</sup>/s), 2.68 in/yr (68 mm/yr), 109,400 acre-ft/yr (135 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 307,000 ft<sup>3</sup>/s (8,690 m<sup>3</sup>/s) Sept. 24, 1955, gage height, 29.95 ft (9.129 m), in gage well, 32.7 ft (9.97 m), from floodmarks, from rating curve extended above 40,000 ft<sup>3</sup>/s (1,130 m<sup>3</sup>/s) on basis of float measurement of 110,000 ft<sup>3</sup>/s (3,120 m<sup>3</sup>/s) and slope-area measurements of 213,000 and 307,000 ft<sup>3</sup>/s (6,030 and 8,690 m<sup>3</sup>/s); minimum, 2.6 ft<sup>3</sup>/s (0.074 m<sup>3</sup>/s) Mar. 14-16, 1957.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1866, that of Sept. 24, 1955. Flood in June 1913 reached a stage of about 29 ft (8.8 m), discharge 210,000 ft<sup>3</sup>/s (5,950 m<sup>3</sup>/s); flood of Sept. 21, 1923, reached a stage of about 26.5 ft (8.08 m), discharge 160,000 ft<sup>3</sup>/s (4,530 m<sup>3</sup>/s); from information by local residents. Discharges based on rating curve mentioned above.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 700 ft<sup>3</sup>/s (19.8 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Apr. 16	0030	*10,800	306	9.97	3.039	May 11	0330	964	27.3	6.27	1.911
Apr. 20	1600	1,730	49.0	6.80	2.073						

Minimum discharge, 50 ft<sup>3</sup>/s (1.42 m<sup>3</sup>/s) for several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	237	329	210	226	195	192	192	494	291	182	108	71
2	232	317	207	227	195	193	194	472	284	178	108	70
3	226	305	204	224	195	194	191	456	274	174	110	68
4	231	298	201	222	191	191	186	443	266	170	105	69
5	250	290	206	220	187	190	185	427	260	168	102	65
6	233	283	205	218	185	190	183	417	255	166	101	68
7	227	277	199	215	187	189	180	407	258	165	101	68
8	228	271	197	212	216	186	177	395	248	162	99	68
9	220	266	195	211	220	185	176	396	239	159	99	66
10	215	263	193	209	218	185	172	390	237	156	100	64
11	210	258	204	207	219	182	171	753	234	152	98	64
12	205	256	202	212	215	181	170	640	230	148	98	63
13	204	259	217	221	212	180	170	522	225	148	97	61
14	200	255	265	219	210	179	202	465	222	146	93	59
15	209	251	276	214	209	178	3680	442	213	143	91	58
16	205	249	280	209	207	176	4500	428	209	141	90	57
17	200	254	270	206	207	178	1900	416	204	139	90	56
18	196	250	265	198	206	176	1200	400	200	139	91	56
19	198	246	260	190	204	173	960	389	195	137	95	55
20	198	241	256	188	202	172	1340	380	191	136	89	55
21	194	235	252	187	202	172	1140	387	189	134	85	55
22	191	230	249	201	202	171	892	374	197	131	83	54
23	190	227	246	210	201	170	781	363	220	128	81	54
24	190	227	243	205	198	170	694	346	223	126	82	52
25	186	231	243	200	197	171	629	335	223	123	82	51
26	183	230	241	197	196	173	588	323	211	118	79	51
27	196	223	237	195	195	184	552	314	200	120	73	52
28	224	218	234	190	193	190	528	309	193	118	73	53
29	329	216	232	188	---	196	514	307	190	119	73	53
30	366	214	230	196	---	196	524	301	185	116	77	52
31	343	---	227	199	---	194	---	298	---	110	73	---
TOTAL	6916	7669	7146	6416	5664	5657	22971	12789	6766	4452	2826	1788
MEAN	223	256	231	207	202	182	766	413	226	144	91.2	59.6
MAX	366	329	280	227	220	196	4500	753	291	182	110	71
MIN	183	214	193	187	185	170	170	298	185	110	73	51
CFSM	.29	.34	.30	.27	.26	.24	1.00	.54	.30	.19	.12	.08
IN.	.34	.37	.35	.31	.28	.28	1.12	.62	.33	.22	.14	.09
AC-FT	13720	15210	14170	12730	11230	11220	45560	25370	13420	8830	5610	3550
CAL YR 1976	TOTAL	84524	MEAN 231	MAX 2730	MIN 51	CFSM .30	IN 4.12	AC-FT 167700				
WTR YR 1977	TOTAL	91060	MEAN 249	MAX 4500	MIN 51	CFSM .33	IN 4.43	AC-FT 180600				

NUECES RIVER BASIN

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08190000 NUECES RIVER AT LAGUNA, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM .7UM-MF (COL./ 100 ML)
DATE	TIME	(CFS)		(UNITS)								
NOV 16...	1100	210	453	7.6	16.0	0	0	9.4	98	.2	120	16
JAN 25...	1115	200	443	7.6	13.5	0	0	10.4	103	.4	12	2
MAR 22...	1155	190	450	8.1	16.5	0	0	9.4	99	.2	8	2
MAY 24...	1030	320	464	7.7	22.0	0	1	8.5	100	.2	200	28
JUL 26...	0820	130	463	7.8	25.5	0	0	7.4	92	.1	140	28
SEP 20...	1130	50	459	8.0	26.0	0	0	8.2	102	.1	28	12
	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
DATE												
NOV 16...	62	220	23	62	15	9.1	.3	.9	236	0	14	17
JAN 25...	28	210	27	61	15	9.1	.3	.9	228	0	16	19
MAR 22...	110	220	38	64	15	10	.3	.9	224	0	14	20
MAY 24...	43	220	30	63	15	9.8	.3	1.0	230	0	18	18
JUL 26...	350	220	39	63	15	11	.3	1.0	220	0	16	24
SEP 20...	25	220	38	61	16	12	.4	1.1	220	0	16	26
	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	
DATE												
NOV 16...	.1	12	246	1	0	1.8	.00	.00	.08	.00	5.1	
JAN 25...	.1	10	244	1	0	.41	.00	.01	.05	.00	--	
MAR 22...	.1	11	245	0	0	2.2	.00	.01	.00	.00	4.5	
MAY 24...	.1	11	249	0	0	2.2	.01	.01	.00	.00	1.8	
JUL 26...	.1	12	251	0	0	2.0	.01	.00	.10	.00	1.4	
SEP 20...	.1	13	254	1	0	1.1	.00	.00	.14	.00	1.2	



## NUECES RIVER BASIN

08190000 NUECES RIVER AT LAGUNA, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
JAN 25...	1115	1	0	0	0	0	0
SEP 20...	1130	0	100	0	0	0	10

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
JAN 25...	1	0	.1	1	0	0
SEP 20...	0	0	.0	0	0	0

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
JAN 25...	1115	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
SEP 20...	1130	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
JAN 25...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
SEP 20...	.00	.00	.00	.00	.00	.00	.00	0	.00	--	--	--

## 08190500 WEST NUECES RIVER NEAR BRACKETTVILLE, TX

LOCATION.--Lat 29°28'21", long 100°14'10", Kinney County, Hydrologic Unit 12110102, at Wilson Ranch, on Farm Road 3199, 1.3 mi (2.1 km) upstream from Miguel Canyon, 16.0 mi (25.7 km) northeast of Brackettville, and 40.2 mi (64.7 km) upstream from mouth.

DRAINAGE AREA.--700 mi<sup>2</sup> (1,800 km<sup>2</sup>).

PERIOD OF RECORD.--September 1939 to September 1950, April 1956 to current year.

REVISED RECORDS.--WSP 1312: 1949(M).

GAGE.--Water-stage recorder. Datum of gage is 1,326.79 ft (404.406 m) above mean sea level. Prior to Mar. 14, 1940, nonrecording gage at same site and datum.

REMARKS.--Records good above 10 ft<sup>3</sup>/s (0.28 m<sup>3</sup>/s) and fair below. In ordinary years, a large part of streamflow from basin is lost by seepage into the Balcones Fault Zone of the Edwards and associated limestones above station. No known diversion above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--32 years (water years 1940-50, 1957-77), 37.3 ft<sup>3</sup>/s (1.056 m<sup>3</sup>/s), 27,020 acre-ft/yr (33.3 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 246,000 ft<sup>3</sup>/s (6,970 m<sup>3</sup>/s) Sept. 20, 1964, gage height, 31.3 ft (9.54 m), from floodmark, from rating curve extended above 4,500 ft<sup>3</sup>/s (127 m<sup>3</sup>/s) on basis of slope-area measurements of 10,000, 51,000, 150,000, and 246,000 ft<sup>3</sup>/s (283, 1,440, 4,250, and 6,970 m<sup>3</sup>/s); no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1879, about 40 ft (12.2 m) June 14, 1935, discharge 550,000 ft<sup>3</sup>/s (15,600 m<sup>3</sup>/s), based on slope-area measurements of 580,000 ft<sup>3</sup>/s (16,400 m<sup>3</sup>/s) at site 33 mi (53 km) upstream from gage and 536,000 ft<sup>3</sup>/s (15,200 m<sup>3</sup>/s) at site 24 mi (39 km) downstream from gage, present site and datum, from gage-height relation of 1935 and 1955 flood peaks at site 0.6 mi (1.0 km) upstream. Flood in 1900 reached a stage of about 34 ft (10.4 m), and flood of Sept. 24, 1955, reached a stage of 27.1 ft (8.26 m), from floodmark at present site, discharge 150,000 ft<sup>3</sup>/s (4,250 m<sup>3</sup>/s), by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 72 ft<sup>3</sup>/s (2.04 m<sup>3</sup>/s) May 13, gage height, 3.26 ft (0.994 m), no peak above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s); no flow Sept. 14-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	22	5.6	4.0	2.8	3.2	.77	3.5	7.0	1.9	.11	.02
2	17	33	5.2	3.8	3.0	3.2	.77	3.4	6.6	1.6	.11	.02
3	15	30	5.1	3.6	2.8	2.8	.70	3.2	6.2	1.4	.11	.02
4	14	26	5.0	3.4	2.7	2.6	.50	3.1	6.0	1.2	.11	.02
5	12	23	5.0	3.2	2.6	2.6	.56	2.9	5.8	1.0	.10	.02
6	11	21	4.5	3.0	2.7	2.4	.56	2.8	5.6	.70	.10	.04
7	10	19	4.3	3.0	2.8	2.2	.47	2.7	5.4	.68	.10	.03
8	9.1	17	4.3	2.9	3.2	2.1	.43	2.6	6.4	.61	.10	.02
9	8.5	15	4.2	2.5	5.0	2.0	.43	2.5	5.8	.52	.10	.02
10	8.1	14	4.0	2.6	6.2	2.0	.43	2.5	5.2	.46	.09	.02
11	7.7	13	3.9	2.6	5.3	1.7	.39	11	4.8	.46	.09	.02
12	7.4	12	3.7	2.7	6.4	1.7	.38	44	4.5	.40	.11	.02
13	7.0	11	4.3	2.5	6.2	1.7	.34	71	4.3	.37	.12	.02
14	6.7	11	5.8	2.3	5.8	1.6	.47	60	4.0	.33	.12	.00
15	6.7	9.8	8.4	2.2	5.3	1.5	.53	50	3.8	.29	.11	.00
16	6.1	9.1	9.1	2.1	5.3	1.4	2.2	41	3.6	.26	.08	.00
17	6.0	8.9	9.3	2.0	4.9	1.3	4.9	34	3.4	.23	.09	.00
18	5.8	8.3	9.0	1.9	4.6	1.2	6.8	29	3.2	.20	.08	.00
19	5.6	8.2	8.2	1.9	4.2	1.1	7.5	25	3.1	.21	.09	.00
20	5.4	7.9	7.3	1.8	4.0	1.1	7.1	22	3.0	.21	.08	.00
21	4.9	7.7	7.0	1.9	3.8	.98	7.0	19	2.9	.20	.03	.00
22	4.8	7.4	6.5	2.2	4.1	.94	6.1	17	2.8	.18	.03	.00
23	4.7	7.1	6.1	2.3	3.5	.93	5.6	15	3.0	.17	.03	.00
24	4.5	6.8	5.7	3.0	3.6	.86	5.0	13	3.5	.15	.03	.00
25	4.2	6.8	5.2	3.3	3.4	.90	4.5	11	4.0	.14	.03	.00
26	4.1	6.4	5.1	3.5	2.8	.96	4.0	10	4.5	.12	.02	.00
27	4.9	6.2	4.9	3.3	3.3	1.2	3.7	9.5	3.5	.13	.02	.00
28	4.9	5.9	4.6	2.9	3.2	.92	3.4	9.0	3.0	.12	.02	.00
29	6.9	6.1	4.5	2.6	---	1.1	3.4	8.5	2.5	.13	.02	.00
30	10	5.8	4.2	2.8	---	1.0	4.3	8.0	2.3	.13	.02	.00
31	13	---	4.0	2.4	---	.83	---	7.5	---	.12	.02	---
TOTAL	254.0	385.4	174.0	84.2	113.5	50.02	83.23	543.7	129.7	14.62	2.27	.29
MEAN	8.19	12.8	5.61	2.72	4.05	1.61	2.77	17.5	4.32	.47	.073	.010
MAX	18	33	9.3	4.0	6.4	3.2	7.5	71	7.0	1.9	.12	.04
MIN	4.1	5.8	3.7	1.8	2.6	.83	.34	2.5	2.3	.12	.02	.00
AC-FT	504	764	345	167	225	99	165	1080	257	29	4.5	.6
CAL YR 1976	TOTAL	27326.30	MEAN	74.7	MAX	7920	MIN	.00	AC-FT	54200		
WTR YR 1977	TOTAL	1834.93	MEAN	5.03	MAX	71	MIN	.00	AC-FT	3640		

## NUECES RIVER BASIN

08192000 NUECES RIVER BELOW UVALDE, TX

LOCATION.--Lat 29°07'25", Long 99°53'40", Uvalde County, Hydrologic Unit 12110103, on right bank at McDaniel Ranch, 5.7 mi (9.2 km) upstream from bridge on U.S. Highway 83, 8.8 mi (14.2 km) southwest of Uvalde, 18.2 mi (29.3 km) downstream from West Nueces River, and at mile 366.0 (588.9 km).

DRAINAGE AREA.--1,947 mi<sup>2</sup> (5,043 km<sup>2</sup>).

PERIOD OF RECORD.--April 1939 to current year. October 1927 to April 1939 published as "near Uvalde"; records equivalent only during periods of floodflow.

REVISED RECORDS.--WSP 1732: 1956(M).

GAGE.--Water-stage recorder. Datum of gage is 796.12 ft (242.657 m) above mean sea level. Oct. 4, 1927, to Apr. 30, 1939, water-stage recorder at site 6.2 mi (10.0 km) upstream at different datum.

REMARKS.--Records good. Part of flow of Nueces River enters Edwards and associated limestones in Balcones Fault Zone which crosses basin downstream from Laguna (station 08190000) and upstream from this station. At low stage most of headwater flow enters this formation. Many small diversions above station for irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--38 years, 119 ft<sup>3</sup>/s (3.370 m<sup>3</sup>/s), 86,220 acre-ft/yr (106 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 189,000 ft<sup>3</sup>/s (5,350 m<sup>3</sup>/s) Sept. 24, 1955, gage height, 24.61 ft (7.501 m), from floodmark, from rating curve extended above 34,000 ft<sup>3</sup>/s (963 m<sup>3</sup>/s) on basis of conveyance study and slope-area measurement of peak flow; no flow at times in 1951-57.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1836, 40.4 ft (12.31 m) June 14, 1935, from floodmarks, discharge at former site, 616,000 ft<sup>3</sup>/s (17,400 m<sup>3</sup>/s), by slope-area measurement. Large floods occurred in 1901 and 1913, stages unknown.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 250 ft<sup>3</sup>/s (7.08 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)	Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)
Apr. 16	0800	*7,450	211	9.33	2.844	May 11	1330	1,270	36.0	5.29	1.612
Apr. 21	0400	1,710	48.4	5.61	1.710						

Minimum discharge, 52 ft<sup>3</sup>/s (1.47 m<sup>3</sup>/s) Sept. 25-27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	345	427	276	276	252	245	192	646	358	171	97	65
2	341	416	270	276	251	243	195	618	347	167	95	64
3	336	401	267	276	250	243	195	595	336	162	93	62
4	333	394	263	275	245	237	191	572	318	156	91	62
5	339	381	274	270	241	235	187	551	308	152	90	64
6	343	377	272	268	238	231	181	530	300	155	89	64
7	338	372	261	264	237	226	181	519	292	155	87	64
8	329	363	257	261	247	225	178	505	295	151	85	64
9	323	356	251	262	259	223	178	495	283	147	85	62
10	316	354	252	259	267	221	173	508	266	144	85	62
11	310	353	255	257	270	218	172	510	262	140	83	61
12	304	348	256	260	269	208	172	943	269	137	83	60
13	298	348	268	270	264	209	172	794	258	135	82	60
14	297	340	295	265	264	208	177	687	249	131	81	59
15	310	337	315	262	261	204	383	620	243	129	80	59
16	311	333	324	255	259	205	5140	587	236	127	79	59
17	298	347	325	249	258	205	2450	561	229	125	78	58
18	291	333	325	246	259	199	1620	542	220	123	75	58
19	291	330	322	243	257	197	1250	518	215	122	75	56
20	285	322	322	239	253	194	1200	503	203	121	73	56
21	280	315	314	237	253	189	1510	489	197	120	73	55
22	276	309	310	252	256	188	1180	485	196	117	73	55
23	276	301	306	264	254	189	1020	470	206	114	73	55
24	276	300	306	263	249	185	915	449	226	111	70	54
25	273	309	302	257	248	185	831	429	222	108	69	53
26	268	309	296	253	244	184	770	416	211	108	69	53
27	279	300	293	250	243	188	724	405	200	106	69	54
28	325	287	291	245	240	191	685	398	191	103	68	55
29	411	282	287	238	---	190	660	390	184	101	66	54
30	440	278	284	251	---	194	681	374	181	101	65	54
31	446	---	279	254	---	196	---	367	---	100	65	---
TOTAL	9888	10222	8918	7997	7088	6455	23563	17006	7501	4039	2446	1761
MEAN	319	341	288	258	253	208	785	549	250	130	78.9	58.7
MAX	446	427	325	276	270	245	5140	1040	358	171	97	65
MIN	268	278	251	237	237	184	172	367	181	100	65	53
AC-FT	19610	20280	17690	15860	14060	12800	46740	33730	14880	8010	4850	3490
CAL YR 1976	TOTAL	108756	MEAN 297	MAX 9250	MIN 27	AC-FT 215700						
WTR YR 1977	TOTAL	106884	MEAN 293	MAX 5140	MIN 53	AC-FT 212000						

## 08193000 NUECES RIVER NEAR ASHERTON, TX

LOCATION.--Lat 28°30'00", long 99°40'54", Dimmit County, Hydrologic Unit 12110103, on right bank 28 ft (9 m) downstream from bridge on Farm Road 190, 0.1 mi (0.2 km) downstream from El Moro Creek, 5.8 mi (9.3 km) northeast of Asherton, and at mile 288.3 (463.9 km).

DRAINAGE AREA.--4,082 mi<sup>2</sup> (10,572 km<sup>2</sup>).

PERIOD OF RECORD.--October 1939 to current year.

REVISED RECORDS.--WSP 1118: 1944.

GAGE.--Water-stage recorder. Datum of gage is 470.92 ft (143.536 m) above mean sea level. Prior to Feb. 2, 1940, nonrecording gage at same site and datum.

REMARKS.--Records good. Part of flow of the Nueces River and its headwater tributaries enters the Edwards and associated limestones in the Balcones Fault Zone which crosses basin between Laguna and Uvalde (stations 08190000 and 08192000, respectively). Considerable loss of flow into various permeable formations occurs downstream from the Balcones Fault Zone. Since March 1948, flow slightly regulated by Upper Nueces Reservoir, capacity 7,590 acre-ft (9.36 hm<sup>3</sup>), 13 mi (21 km) upstream. Many small diversions above station for irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--38 years, 187 ft<sup>3</sup>/s (5.296 m<sup>3</sup>/s), 135,500 acre-ft/yr (167 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,500 ft<sup>3</sup>/s (807 m<sup>3</sup>/s) Oct. 6, 1959, gage height, 30.88 ft (9.412 m); no flow for many days each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1900, 33 ft (10.1 m) June 17, 1935; flood of June 30, 1913, reached about same stage, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,000 ft<sup>3</sup>/s (56.6 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Nov. 1	1500	2,130	60.3	15.27	4.654	Apr. 18	0700	*2,950	83.5	18.16	5.535

Minimum discharge, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	292	2110	259	251	234	200	136	668	280	129	41	.00
2	280	2010	254	250	238	202	133	646	280	113	42	.00
3	268	1530	251	250	240	199	129	622	259	108	41	.00
4	263	931	250	250	238	196	132	595	232	102	35	.00
5	343	620	250	250	234	192	137	572	210	98	28	.00
6	374	480	258	251	230	188	127	553	200	88	23	.00
7	371	408	257	249	226	186	120	529	206	81	21	.00
8	487	366	244	248	228	182	112	507	220	80	17	.00
9	485	337	241	246	228	181	118	545	209	77	14	.00
10	412	325	240	240	229	178	122	537	192	70	10	.00
11	350	311	244	233	239	173	122	496	178	69	9.6	.00
12	313	301	254	234	247	165	121	522	165	66	8.2	.00
13	290	297	274	248	247	164	113	747	172	59	4.6	.00
14	278	293	401	248	245	172	112	763	181	50	3.0	.00
15	272	291	369	246	244	170	119	692	159	53	2.7	.00
16	292	286	357	244	233	168	146	625	141	55	1.9	.00
17	268	296	364	239	230	162	1260	578	134	57	1.4	.00
18	264	309	367	235	230	163	2790	546	135	55	1.2	.00
19	262	327	364	230	228	160	2100	509	130	51	.78	.00
20	252	316	352	226	227	157	1450	480	115	47	.44	.00
21	243	304	327	221	226	164	1130	440	106	50	.19	.00
22	235	293	307	230	229	157	1210	413	95	55	.03	.00
23	235	285	297	239	229	153	1240	427	104	61	.01	.00
24	243	282	290	241	221	155	1040	401	126	63	.00	.00
25	245	286	289	243	216	173	918	387	138	58	.00	.00
26	234	296	282	242	215	155	830	372	153	47	.00	.00
27	233	294	275	240	208	157	762	354	160	45	.00	.00
28	300	285	270	231	203	163	712	338	152	48	.00	.00
29	1230	273	258	224	---	157	678	319	148	44	.00	.00
30	1830	264	259	221	---	144	675	343	143	39	.00	.00
31	1980	---	258	231	---	139	---	310	---	40	.00	---
TOTAL	13424	15006	8962	7431	6442	5275	18794	15836	5123	2058	306.05	.00
MEAN	433	500	289	240	230	170	626	511	171	66.4	9.87	.000
MAX	1980	2110	401	251	247	202	2790	763	280	129	42	.00
MIN	233	264	240	221	203	139	112	310	95	39	.00	.00
AC-FT	26630	29760	17780	14740	12780	10460	37280	31410	10160	4080	607	.00
CAL YR 1976	TOTAL	103629.26	MEAN	283	MAX	6190	MIN	.00	AC-FT	205500		
WTR YR 1977	TOTAL	98657.05	MEAN	270	MAX	2790	MIN	.00	AC-FT	195700		

## NUECES RIVER BASIN

## 08194000 NUECES RIVER AT COTULLA, TX

LOCATION (revised).--Lat 28°25'34", long 99°14'23", La Salle County, Hydrologic Unit 12110105, on left bank at downstream side of bridge on U.S. Highway 81, 0.4 mi (0.6 km) upstream from Missouri Pacific Railroad Co. bridge, 0.8 mi (1.3 km) southwest of Cotulla, 1.0 mi (1.6 km) upstream from Lind Dam, and at mile 235.7 (379.2 km).

DRAINAGE AREA.--5,260 mi<sup>2</sup> (13,620 km<sup>2</sup>).

PERIOD OF RECORD.--November 1923 to current year. November 1923 to September 1926 monthly discharge only, published in WSP 1312; figures of daily discharge for Oct. 31, 1923, to Sept. 30, 1926, published in WSP 588, 608, and 628, have been found to be unreliable and should not be used. Gage-height records collected in this vicinity in 1914-17 and since 1922 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1732: 1957(M). See PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 368.08 ft (112.191 m) above mean sea level. Oct. 31, 1923, to Aug. 3, 1924, nonrecording gage at approximate site of present gage at datum 7.28 ft (2.219 m) higher. Aug. 4, 1924, to Nov. 19, 1934, nonrecording gage at site 5,000 ft (1,520 m) downstream at datum 8.42 ft (2.566 m) higher. Nov. 20, 1934, to July 14, 1938, water-stage recorder, and July 15, 1938, to Apr. 30, 1963, nonrecording gage at present site and datum.

REMARKS.--Records good. Part of flow of Nueces River and its headwater tributaries enter the Edwards and associated limestones in the Balcones Fault Zone between Launa and Uvalde (stations 08190000 and 08192000, respectively). Considerable loss of flow into various permeable formations occurs downstream from the Balcones Fault Zone. Low flow is slightly regulated by small storage reservoirs above station, and most is diverted above station by pumping (see REMARKS for Nueces River near Asherton, station 08193000). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--53 years (water years 1925-77), 281 ft<sup>3</sup>/s (7.958 m<sup>3</sup>/s), 203,600 acre-ft/yr (251 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 82,600 ft<sup>3</sup>/s (2,340 m<sup>3</sup>/s) June 18, 1935, gage height, 32.4 ft (9.88 m), from flood-marks, from rating curve extended above 43,000 ft<sup>3</sup>/s (1,220 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1879, that of June 18, 1935. Flood of June 19, 1899, reached a stage of 29.7 ft (9.05 m), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,080 ft<sup>3</sup>/s (116 m<sup>3</sup>/s) Nov. 2, gage height, 14.08 ft (4.292 m), no other peak above base of 2,500 ft<sup>3</sup>/s (70.8 m<sup>3</sup>/s); no flow Sept. 3-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	379	3360	341	305	245	224	148	936	667	133	36	.03
2	358	3970	321	300	264	219	140	891	504	126	34	.01
3	337	3850	308	295	272	213	137	837	389	114	33	.00
4	316	3470	294	291	275	214	129	786	339	100	34	.00
5	299	3070	337	291	275	213	124	738	279	96	32	.00
6	290	2590	296	291	268	204	123	686	227	89	31	.00
7	395	2050	285	291	262	203	131	642	204	80	29	.00
8	458	1390	290	290	257	198	123	605	189	74	25	.00
9	491	782	287	282	250	196	116	581	189	66	19	.00
10	612	568	268	279	254	193	110	559	191	65	17	.00
11	630	480	264	277	259	189	111	606	186	64	14	.00
12	538	430	275	276	257	186	115	647	174	57	11	.00
13	447	396	315	275	269	180	117	635	165	54	7.8	.00
14	384	369	399	270	277	174	118	694	151	54	5.4	.00
15	348	354	413	281	275	172	113	885	148	50	4.3	.00
16	322	343	530	283	273	177	130	962	148	45	3.4	.00
17	312	362	537	276	271	179	125	898	144	42	2.8	.00
18	322	366	557	271	259	176	190	783	128	43	2.6	.00
19	301	405	619	266	252	166	650	676	122	47	2.3	.00
20	292	428	681	259	253	164	1420	620	120	47	1.9	.00
21	284	431	686	254	249	164	1590	571	118	43	1.6	.00
22	269	401	623	265	249	160	1830	528	110	42	1.2	.00
23	258	382	533	266	248	160	1970	489	110	39	.74	.00
24	256	373	464	266	248	160	1800	467	96	41	.55	.00
25	261	389	426	273	246	158	1680	467	96	45	.34	.00
26	261	401	398	273	237	154	1610	445	110	49	.23	.00
27	265	403	382	273	230	168	1490	452	120	53	.17	.00
28	319	401	363	274	230	166	1300	559	131	46	.13	.00
29	611	379	345	266	---	158	1100	653	137	40	.11	.00
30	838	350	332	259	---	158	995	720	137	40	.13	.00
31	1920	---	313	247	---	157	---	750	---	40	.08	---
TOTAL	13373	32943	12482	8565	7204	5603	19735	20768	5829	1924	350.78	.04
MEAN	431	1098	403	276	257	181	658	670	194	62.1	11.3	.001
MAX	1920	3970	686	305	277	224	1970	962	667	133	36	.03
MIN	256	343	264	247	230	154	110	445	96	39	.08	.00
AC-FT	26530	65340	24760	16990	14290	11110	39140	41190	11560	3820	696	.08
CAL YR 1976	TOTAL	131097.33	MEAN	358	MAX	5250	MIN	.00	AC-FT	260000		
WTR YR 1977	TOTAL	128776.82	MEAN	353	MAX	3970	MIN	.00	AC-FT	255400		



LOCATION.--Lat 27°57'53", long 98°58'00", Webb County, Hydrologic Unit 12110105, at downstream side of bridge on State Highway 44, 11.4 mi (18.3 km) upstream from mouth, and 22 mi (35 km) northwest of Freer.

GAGE.--Water-stage recorder. Datum of gage is 298 ft (90.8 m) above mean sea level (State Highway Department bridge plans).

AVERAGE DISCHARGE.--15 years, 73.1 ft<sup>3</sup>/s (2.070 m<sup>3</sup>/s), 2.12 in/yr (54 mm/yr), 52,960 acre-ft/yr (65.3 hm<sup>3</sup>/yr).

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1946, that of Oct. 17, 1971. Second highest stage, 26 ft (7.9 m), discharge 65,200 ft<sup>3</sup>/s (1,850 m<sup>3</sup>/s) occurred in 1954, from information by State Highway Department.

Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)	Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)
Oct. 29	1800	*4,760	135	21.11	6.434	Dec. 19	2400	1,670	47.3	17.80	5.425
Dec. 15	0300	985	27.9	15.77	4.807	May 25	2200	1,900	53.8	18.23	5.557

Minimum discharge, no flow for many days.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	1150	108	17	22	3.8	1.4	.91	2.3	.12	.00	.00
2	34	206	56	15	52	3.8	1.3	.90	4.4	.12	.00	.00
3	32	64	35	17	56	3.8	1.2	.77	5.0	.11	.00	.00
4	30	43	23	18	60	3.5	.99	.74	2.0	.10	.00	.00
5	30	29	20	19	53	3.3	.90	.65	1.2	.10	.00	.00
6	30	22	20	17	34	3.0	.82	.70	1.0	.10	.00	.00
7	29	19	20	16	20	3.0	.87	.73	.84	.10	.00	.00
8	29	12	19	14	15	3.0	.80	.72	.69	.09	.00	.00
9	29	9.5	14	14	11	3.0	.80	18	.61	.09	.00	.00
10	29	7.8	11	12	11	2.6	.80	27	.54	.09	.00	.00
11	24	8.7	10	10	12	2.2	.90	4.6	.46	.07	.00	.00
12	28	379	11	11	12	3.0	.80	3.6	.38	.06	.00	.00
13	28	64	64	45	10	3.6	.90	3.0	.36	.06	.00	.00
14	27	25	703	116	10	2.7	.90	1.4	.33	.06	.00	.00
15	52	14	918	106	6.9	2.4	.90	1.4	.47	.07	.00	.00
16	42	9.4	716	74	5.6	2.1	1.0	28	6.5	.08	.00	.00
17	34	293	513	45	5.2	1.9	1.1	315	1.1	.08	.00	.00
18	29	378	145	23	5.3	1.8	1.1	19	.42	.11	.00	.00
19	29	258	903	16	5.8	1.7	1.3	4.5	.25	.10	.00	.00
20	15	213	1520	15	5.5	1.6	2.8	1.4	.20	.10	.00	.00
21	7.7	153	844	13	5.8	1.8	2.3	2.3	.18	.12	.00	.00
22	5.8	74	507	32	5.7	1.9	1.7	2.1	.20	.12	.00	.00
23	5.7	42	171	149	14	1.7	1.5	831	.50	.10	.00	.00
24	4.7	25	65	148	5.7	1.7	1.9	941	.91	.08	.00	.00
25	4.9	21	54	117	5.1	1.7	1.6	1290	.54	.06	.00	.00
26	4.9	38	51	63	4.7	1.8	1.5	1260	.35	.06	.00	.00
27	69	31	41	38	4.1	1.8	.91	259	.22	.05	.00	.00
28	1570	104	35	24	4.0	1.6	.81	17	.17	.04	.00	.00
29	4560	182	27	19	---	1.6	.80	8.4	.14	.02	.00	.00
30	4100	166	23	12	---	1.5	1.1	4.8	.13	.00	.00	.00
31	3140	---	21	11	---	1.4	---	3.0	---	.00	.00	---
TOTAL	14091.7	4040.4	7668	1246	461.4	74.3	35.70	5051.62	32.39	2.46	.00	.00
MEAN	455	135	247	40.2	16.5	2.40	1.19	163	1.08	.079	.000	.000
MAX	4560	1150	1520	149	60	3.8	2.8	1290	6.5	.12	.00	.00
MIN	4.7	7.8	10	10	4.0	1.4	.80	.65	.13	.00	.00	.00
CFSM	.97	.29	.53	.09	.04	.005	.003	.35	.002	.000	.000	.000
IN.	1.12	.32	.61	.10	.04	.01	.00	.40	.00	.00	.00	.00
AC-FT	27950	8010	15210	2470	915	147	71	10020	64	4.9	.00	.00
CAL YR 1976	TOTAL	39617.43	MEAN	108	MAX	4560	MIN	.00	CFSM	.23	IN	3.14
WTR YR 1977	TOTAL	32703.97	MEAN	89.6	MAX	4560	MIN	.00	CFSM	.19	IN	2.59
										AC-FT	78580	64870



## 08194500 NUECES RIVER NEAR TILDEN, TX

LOCATION.--Lat 28°18'31", long 98°33'25", McMullen County, Hydrologic Unit 12110105, on right bank at downstream side of pier of bridge on State Highway 16, 1.8 mi (2.9 km) upstream from Kings Branch, 10.5 mi (16.9 km) south of Tilden, and at mile 141.2 (227.2 km).

DRAINAGE AREA.--8,192 mi<sup>2</sup> (21,217 km<sup>2</sup>).

PERIOD OF RECORD.--November 1942 to current year.

REVISED RECORDS.--WSP 1512: 1947. WSP 1732: 1951(M).

GAGE.--Water-stage recorder. Datum of gage is 183.5 ft (55.93 m) above mean sea level.

REMARKS.--Records good. Part of flow of Nueces River and its headwater tributaries enters Edwards and associated limestones in the Balcones Fault Zone between Laguna and Uvalde (stations 08190000 and 08192000, respectively). Some loss of flow into various permeable formations occurs downstream from the Balcones Fault Zone. Some diversions for irrigation above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years (water years 1944-77), 464 ft<sup>3</sup>/s (13.14 m<sup>3</sup>/s), 336,200 acre-ft/yr (415 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 76,500 ft<sup>3</sup>/s (2,170 m<sup>3</sup>/s) Sept. 24, 1967, gage height, 26.57 ft (8.099 m); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1902, that of Sept. 24, 1967. Flood of Oct. 11, 1946, reached a stage of 26.46 ft (8.065 m), discharge 70,000 ft<sup>3</sup>/s (1,980 m<sup>3</sup>/s). Floods in June 1935 reached a stage of 23.7 ft (7.22 m) and in July 1942 about 22 ft (6.7 m), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,800 ft<sup>3</sup>/s (51.0 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 4	0900	2,010	56.9	15.63	4.764	Nov. 1	2200	*17,500	496	21.29	6.489
Oct. 11	2200	2,690	76.2	16.55	5.044	Dec. 20	1700	3,530	100	17.34	5.285

Minimum discharge, 0.74 ft<sup>3</sup>/s (0.021 m<sup>3</sup>/s) Aug. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1290	15800	844	396	338	259	180	1260	1560	140	30	.82
2	1490	16600	757	373	330	257	190	1260	1240	141	27	.84
3	1780	13500	634	357	352	255	189	1200	792	131	25	.88
4	1940	9820	522	351	377	252	178	1010	696	123	25	.89
5	1310	6610	455	345	390	246	164	810	555	115	23	.91
6	1150	4660	418	339	392	239	154	725	438	103	22	.91
7	1390	3770	397	335	380	235	144	678	377	92	20	.91
8	1530	3360	398	334	356	230	137	647	327	85	19	1.6
9	1700	3230	369	331	334	226	138	618	284	80	18	1.9
10	2100	3190	350	326	319	224	144	592	252	75	17	1.2
11	2580	3100	343	321	311	220	140	609	227	70	17	1.4
12	2580	2930	336	319	307	218	131	638	229	63	16	1.3
13	1990	2700	334	350	307	215	126	600	230	58	14	1.3
14	972	2130	638	426	302	210	125	587	261	56	11	1.4
15	542	1160	1100	536	299	209	131	597	218	51	8.8	2.0
16	576	561	1310	581	302	204	143	592	189	47	7.0	1.8
17	672	556	1490	525	303	195	157	606	167	47	5.6	1.6
18	935	698	1790	467	299	192	187	683	180	47	4.4	1.6
19	889	983	2510	409	296	197	198	813	176	48	3.6	1.6
20	529	1190	3370	367	292	197	172	878	150	53	2.9	1.7
21	408	1260	3460	341	283	190	257	790	127	40	2.3	1.6
22	354	1260	3200	365	279	182	517	653	123	35	1.7	1.7
23	327	1140	2920	515	278	177	716	588	232	35	1.5	1.8
24	312	860	2890	624	275	178	857	594	364	35	1.3	1.9
25	296	644	2770	789	273	178	952	784	355	32	1.1	2.1
26	294	647	2370	801	271	185	1010	941	255	29	.93	2.1
27	303	642	1520	701	271	187	1070	1040	139	28	.85	2.1
28	589	672	647	566	267	183	1120	1120	117	29	.82	2.3
29	2060	763	503	447	---	189	1170	1220	124	31	.86	2.4
30	4140	832	458	387	---	199	1220	1340	133	33	.84	2.5
31	6490	---	423	354	---	186	---	1480	---	33	.82	---
TOTAL	43518	105268	39526	13678	8783	6514	12017	25953	10517	1985	329.32	47.06
MEAN	1404	3509	1275	441	314	210	401	837	351	64.0	10.6	1.57
MAX	6490	16600	3460	801	392	259	1220	1480	1560	141	30	2.5
MIN	294	556	334	319	267	177	125	587	117	28	.82	.82
AC-FT	86320	208800	78400	27130	17420	12920	23840	51480	20860	3940	653	93
CAL YR 1976	TOTAL	305527.28	MEAN	835	MAX	16600	MIN	.22	AC-FT	606000		
WTR YR 1977	TOTAL	268135.38	MEAN	735	MAX	16600	MIN	.82	AC-FT	531800		

## 08194600 NUECES RIVER AT SIMMONS, TX

LOCATION.--Lat 28°25'16", long 98°17'03", Live Oak County, Hydrologic Unit 12110105, on right bank 58 ft (18 m) upstream from centerline of county road, 714 ft (218 m) to right of right abutment of county road bridge, 1.1 mi (1.8 km) north of Simmons, 1.5 mi (2.4 km) upstream from Lang Creek, 10.1 mi (16.3 km) upstream from Frio River, and at mile 113.7 (182.9 km).

DRAINAGE AREA.--8,561 mi<sup>2</sup> (22,173 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

GAGE.--Water-stage recorder. Datum of gage is 119.63 ft (36.463 m) above mean sea level.

REMARKS.--Records good. Part of flow of the Nueces River and its headwater tributaries enters the Edwards and associated limestones in the Balcones Fault Zone between Laguna and Uvalde (stations 08190000 and 08192000, respectively). Some loss of flow into various permeable formations occurs downstream from the Balcones Fault Zone. Some diversions for irrigation above station.

AVERAGE DISCHARGE.--12 years, 590 ft<sup>3</sup>/s (16.71 m<sup>3</sup>/s), 427,500 acre-ft/yr (527 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 72,000 ft<sup>3</sup>/s (2,040 m<sup>3</sup>/s) Sept. 25, 1967, gage height, 43.21 ft (13.170 m); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1875, 43.5 ft (13.26 m), discharge 75,800 ft<sup>3</sup>/s (2,150 m<sup>3</sup>/s), in September 1919; floods in June 1935 and July 1942 reached a stage of 42.0 ft (12.80 m), discharge 58,500 ft<sup>3</sup>/s (1,660 m<sup>3</sup>/s), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,000 ft<sup>3</sup>/s (56.6 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 13	1430	2,150 60.9	18.03 5.496	Dec. 22	2130	3,160 89.5	21.44 6.535
Nov. 3	1630	*13,300 377	31.68 9.656				

Minimum discharge, no flow Sept. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1030	4700	892	424	325	230	153	1180	1390	128	38	1.0
2	1160	9020	854	397	310	226	150	1200	1470	133	36	1.1
3	1340	12800	738	376	307	226	149	1200	1120	130	32	1.5
4	1540	11900	600	360	335	224	144	1130	723	122	30	1.3
5	1880	8920	497	353	347	218	135	923	591	117	29	.82
6	1400	6420	431	346	356	213	127	734	446	109	28	.51
7	1140	4860	388	338	354	209	122	660	359	100	26	.64
8	1260	3920	382	334	338	207	117	616	311	92	25	6.6
9	1390	3360	371	332	315	203	114	593	269	86	23	4.2
10	1520	3000	342	323	299	202	115	552	235	82	21	2.9
11	1700	2840	326	321	291	196	120	531	210	78	21	1.7
12	1950	2760	322	320	281	191	116	567	200	73	21	1.9
13	2120	2650	315	339	277	190	112	567	202	67	20	1.7
14	1900	2480	545	399	275	187	109	532	200	64	17	2.9
15	852	2150	1040	467	268	184	273	529	237	62	15	3.2
16	671	1180	1180	567	266	183	704	536	193	57	12	2.3
17	617	606	1320	559	269	176	441	530	166	55	9.6	1.5
18	747	653	1480	502	270	169	326	565	155	55	8.0	1.2
19	897	884	1690	442	265	168	210	676	166	55	7.0	1.4
20	722	1140	2260	386	262	169	200	801	154	57	5.5	1.0
21	474	1220	2750	349	256	167	190	821	134	58	4.7	.87
22	388	1260	3100	360	249	160	205	690	124	47	4.0	.60
23	343	1250	3060	584	246	153	300	570	141	43	3.4	.47
24	328	1110	2770	587	242	154	781	520	277	43	2.9	.35
25	307	835	2600	711	241	152	914	595	314	42	2.4	.35
26	293	689	2510	823	237	153	949	799	285	39	1.9	.35
27	340	716	2270	783	234	162	1020	934	176	36	1.5	.15
28	707	750	1490	654	235	160	1060	1020	123	34	1.3	.04
29	2630	897	621	498	---	155	1090	1100	115	35	1.4	.00
30	3470	857	518	395	---	159	1140	1180	122	36	1.3	.00
31	3350	---	465	345	---	162	---	1280	---	38	1.2	---
TOTAL	38466	95827	38127	13974	7950	5708	11586	24131	10608	2173	450.1	42.55
MEAN	1241	3194	1230	451	284	184	386	778	354	70.1	14.5	1.42
MAX	3470	12800	3100	823	356	230	1140	1280	1470	133	38	6.6
MIN	293	606	315	320	234	152	109	520	115	34	1.2	.00
AC-FT	76300	190100	75620	27720	15770	11320	22980	47860	21040	4310	893	84
CAL YR 1976	TOTAL	288198.83	MEAN	787	MAX	12800	MIN	.00	AC-FT	571600		
WTR YR 1977	TOTAL	249042.65	MEAN	682	MAX	12800	MIN	.00	AC-FT	494000		

## GUADALUPE RIVER BASIN

08194600 NUECES RIVER AT SIMMONS, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Sediment records: October 1976 to September 1977.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)	SUS. SED. FALL DIAM. % FINER THAN .002 MM	SUS. SED. FALL DIAM. % FINER THAN .004 MM
OCT 27...	1745	340	18.0	28	26	74	85
		SUS. SED. FALL DIAM. % FINER THAN .008 MM	SUS. SED. FALL DIAM. % FINER THAN .016 MM	SUS. SED. FALL DIAM. % FINER THAN .031 MM	SUS. SED. FALL DIAM. % FINER THAN .062 MM	SUS. SED. FALL DIAM. % FINER THAN .125 MM	SUS. SED. FALL DIAM. % FINER THAN .250 MM
OCT 27...	89	92	93	95	97	98	100

## 08195000 FRIO RIVER AT CONCAN, TX

LOCATION.--Lat 29°29'18", long 99°42'16", Uvalde County, Hydrologic Unit 12110106, on left bank 0.7 mi (1.1 km) southeast of Concan Post Office, 15 mi (24 km) upstream from Dry Frio River, and 224.1 mi (360.6 km) upstream from mouth.

DRAINAGE AREA.--405 mi<sup>2</sup> (1,049 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1923 to September 1929, October 1930 to current year.

REVISED RECORDS.--WSP 1342: Drainage area. WSP 1512: 1926, 1931-32, 1934(M), 1935-36. WSP 1712: 1958. WSP 1923: 1954(M), 1957(M).

GAGE.--Water-stage recorder. Datum of gage is 1,203.71 ft (366.891 m) above mean sea level. Oct. 26, 1923, to July 28, 1924, nonrecording gage at site 86 ft (26 m) upstream at datum 5.08 ft (1.548 m) lower. July 29, 1924, to Oct. 3, 1930, nonrecording gage, and Oct. 4, 1930, to May 18, 1939, water-stage recorder, at site 130 ft (40 m) downstream at present datum.

REMARKS.--Water-discharge records good. Many small diversions for irrigation above station.

AVERAGE DISCHARGE.--52 years (water years 1925-29, 1931-77), 109 ft<sup>3</sup>/s (3.087 m<sup>3</sup>/s), 3.65 in/yr (93 mm/yr), 78,970 acre-ft/yr (97.4 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 162,000 ft<sup>3</sup>/s (4,590 m<sup>3</sup>/s) July 1, 1932, gage height, 34.44 ft (10.497 m), from flood-marks, from rating curve extended above 44,000 ft<sup>3</sup>/s (1,250 m<sup>3</sup>/s) on basis of flow-over-dam measurement of 56,600 ft<sup>3</sup>/s (1,600 m<sup>3</sup>/s) and slope-area measurement of 162,000 ft<sup>3</sup>/s (4,590 m<sup>3</sup>/s); no flow Aug. 5, 1956, to Jan. 6, 1957.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1869, that of July 1, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft<sup>3</sup>/s (14.2 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 15	1330	*18,200 515	12.74 3.883	Apr. 20	0600	1,510 42.8	5.68 1.731

Minimum discharge, 56 ft<sup>3</sup>/s (1.59 m<sup>3</sup>/s) for several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	133	180	126	153	162	172	134	382	237	135	87	65
2	132	172	125	153	165	172	134	362	225	133	85	65
3	129	168	124	150	165	171	130	356	205	130	85	64
4	135	165	122	150	163	169	125	343	198	125	83	63
5	145	162	135	149	162	168	121	326	197	122	82	63
6	131	158	129	148	163	166	119	320	190	119	80	64
7	128	157	125	146	164	162	117	313	186	118	82	71
8	131	154	125	145	187	162	114	303	186	118	80	75
9	126	154	123	140	182	160	114	297	182	116	78	70
10	122	154	122	141	186	161	114	292	175	115	77	67
11	122	150	126	141	189	155	110	369	169	114	77	65
12	120	148	126	147	187	154	109	348	160	111	76	64
13	118	151	130	158	187	155	110	322	161	109	78	65
14	118	147	171	154	188	154	145	307	160	105	77	65
15	136	146	178	150	187	153	3440	300	157	104	77	65
16	123	146	177	148	186	150	1790	297	153	101	76	65
17	120	148	174	145	185	151	833	290	153	100	76	64
18	117	146	171	143	185	149	587	284	149	101	74	62
19	119	145	171	142	185	146	512	275	144	101	74	60
20	119	141	166	142	183	146	944	271	141	100	74	61
21	115	138	167	141	183	145	639	294	139	99	72	62
22	115	136	163	157	185	142	560	284	141	95	72	58
23	115	134	162	162	180	141	498	269	150	94	71	57
24	115	135	162	156	179	141	465	257	164	92	68	58
25	113	140	161	154	178	139	436	247	168	89	69	57
26	112	137	158	154	172	144	422	247	160	89	68	56
27	116	131	158	154	173	151	391	242	153	91	67	56
28	130	129	156	154	173	148	386	234	147	89	67	56
29	182	129	154	155	---	139	374	233	144	89	67	56
30	186	127	154	165	---	137	407	227	137	91	66	56
31	189	---	152	167	---	136	---	221	---	89	65	---
TOTAL	4012	4428	4593	4664	4984	4739	14380	9112	5031	3284	2330	1875
MEAN	129	148	148	150	178	153	479	294	168	106	75.2	62.5
MAX	189	180	178	167	189	172	3440	382	237	135	87	75
MIN	112	127	122	140	162	136	109	221	137	89	65	56
CFSM	.32	.37	.37	.37	.44	.38	1.18	.73	.42	.26	.19	.15
IN.	.37	.41	.42	.43	.46	.44	1.32	.84	.46	.30	.21	.17
AC-FT	7960	8780	9110	9250	9890	9400	28520	18070	9980	6510	4620	3720
CAL YR 1976	TOTAL	68713	MEAN 188	MAX 2910	MIN 54	CFSM .46	IN 6.31	AC-FT 136300				
WTR YR 1977	TOTAL	63432	MEAN 174	MAX 3440	MIN 56	CFSM .43	IN 5.83	AC-FT 125800				

NUECES RIVER BASIN  
08195000 FRIO RIVER AT CONCAN, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. / 100 ML)	
NOV 16...	0830	140	463	7.8	13.0	0	0	10.1	99	.2	80	--	
JAN 25...	0840	150	450	7.8	11.0	0	0	10.3	96	.5	100	20	
MAR 22...	0835	140	461	8.1	15.5	0	0	9.8	101	.2	100	16	
MAY 23...	1550	270	438	7.7	25.0	0	0	8.5	105	.2	19	9	
JUL 26...	1040	85	418	8.1	27.0	0	0	8.1	103	.2	240	61	
SEP 20...	0900	60	405	8.1	25.5	0	0	7.7	96	.1	280	130	
		FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
NOV 16...	58	230	22	67	15	7.6	.2	.9	253	0	14	14	
JAN 25...	52	230	25	67	14	7.5	.2	.9	244	0	16	15	
MAR 22...	86	230	25	67	14	8.3	.2	.9	244	0	15	16	
MAY 23...	24	220	21	66	13	7.7	.2	1.0	240	0	18	13	
JUL 26...	120	200	22	58	14	8.2	.3	.9	220	0	16	16	
SEP 20...	420	200	27	55	15	8.3	.3	1.0	210	0	13	17	
		DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	
NOV 16...	.1	12	255	0	0	1.3	.00	.01	.05	.00	3.1		
JAN 25...	.1	10	251	0	0	.58	.00	.01	.11	.00	1.2		
MAR 22...	.1	11	253	1	0	1.7	.01	.01	.06	.00	6.2		
MAY 23...	.1	10	247	0	0	1.6	.01	.01	.00	.00	--		
JUL 26...	.1	12	234	1	0	1.1	.01	.00	.10	.00	2.0		
SEP 20...	.1	13	226	1	0	.47	.00	.00	.05	.02	.9		

NUECES RIVER BASIN

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08195000 FRIO RIVER AT CONCAN, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
JAN 25...	0840	1	0	0	0	0	0
SEP 20...	0900	0	0	0	0	0	20

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
JAN 25...	2	0	.1	1	0	0
SEP 20...	1	1	.0	0	0	0

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
JAN 25...	0840	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
SEP 20...	0900	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
JAN 25...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
SEP 20...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00



## NUECES RIVER BASIN

08196000 DRY FRIO RIVER NEAR REAGAN WELLS, TX

LOCATION.--Lat 29°30'16", Long 99°46'52", Uvalde County, Hydrologic Unit 12110106, on right bank 2.3 mi (3.7 km) upstream from bridge on U.S. Highway 83, 3.1 mi (5.0 km) upstream from Rocky Creek, and 4.3 mi (6.9 km) southeast of Reagan Wells.

DRAINAGE AREA.--117 mi<sup>2</sup> (303 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1952 to current year.

REVISED RECORDS.--WSP 1712: 1953. WSP 1923: 1955(M).

GAGE.--Water-stage recorder. Datum of gage is 1,335.2 ft (406.97 m) above mean sea level, adjustment unknown.

REMARKS.--Water-discharge records good. Several small diversions above station.

AVERAGE DISCHARGE.--25 years, 35.5 ft<sup>3</sup>/s (1.005 m<sup>3</sup>/s), 4.12 in/yr (105 mm/yr), 25,720 acre-ft/yr (31.7 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 123,000 ft<sup>3</sup>/s (3,480 m<sup>3</sup>/s) Aug. 13, 1966, gage height, 27.6 ft (8.41 m), from flood-mark), from rating curve extended above 900 ft<sup>3</sup>/s (25.5 m<sup>3</sup>/s) on basis of slope-area measurements of 11,400, 30,700, 64,700, and 123,000 ft<sup>3</sup>/s (323, 869, 1,830, and 3,480 m<sup>3</sup>/s); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1875 occurred in 1880, about 33 ft (10.1 m). Flood of June 14, 1935, reached a stage of 26.0 ft (7.92 m), discharge at site 2.6 mi (4.2 km) upstream, 64,700 ft<sup>3</sup>/s (1,830 m<sup>3</sup>/s), and that of July 1, 1932, reached a stage of 23 ft (7.0 m), discharge at site 2.0 mi (3.2 km) upstream, 30,700 ft<sup>3</sup>/s (869 m<sup>3</sup>/s), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 267 ft<sup>3</sup>/s (7.56 m<sup>3</sup>/s) Oct. 29, gage height, 2.94 ft (0.896 m), no other peak above base of 200 ft<sup>3</sup>/s (5.66 m<sup>3</sup>/s); minimum, 5.9 ft<sup>3</sup>/s (0.17 m<sup>3</sup>/s) Sept. 21-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	52	115	45	55	59	51	31	60	52	21	10	7.2		
2	50	102	45	55	59	51	31	57	50	20	10	7.2		
3	50	92	44	54	60	51	30	56	49	19	10	7.1		
4	56	84	43	53	58	49	28	55	51	19	10	7.0		
5	65	80	49	52	56	48	27	51	49	18	10	7.0		
6	55	76	49	51	55	46	26	51	48	18	9.9	6.9		
7	52	72	46	49	55	45	25	50	47	17	9.8	6.8		
8	52	69	44	48	70	44	25	48	45	17	9.7	7.5		
9	49	67	43	47	73	43	27	47	40	16	9.6	7.1		
10	46	65	43	45	73	44	29	46	42	16	9.6	6.8		
11	45	63	46	44	74	42	25	96	41	15	9.6	6.7		
12	44	62	45	48	72	41	26	75	39	15	9.5	6.5		
13	43	62	55	53	70	40	26	65	38	15	9.5	6.4		
14	43	60	133	52	69	40	36	62	36	14	9.4	6.3		
15	49	57	118	50	66	40	39	60	35	14	9.4	6.2		
16	47	55	101	48	65	38	82	59	34	14	9.4	6.1		
17	43	57	92	47	64	39	88	57	33	13	9.3	6.1		
18	43	56	88	45	62	38	71	55	32	13	9.0	6.0		
19	45	56	84	44	61	37	67	53	30	13	8.8	6.0		
20	43	54	79	43	61	35	82	52	29	12	8.6	6.0		
21	41	51	75	43	60	35	75	67	28	12	8.4	5.9		
22	40	49	72	51	60	34	71	69	27	12	8.3	5.9		
23	41	48	71	63	59	33	68	64	28	12	8.2	5.9		
24	41	49	69	62	57	33	65	61	29	11	8.1	5.9		
25	41	53	68	61	56	33	64	59	31	11	8.0	5.9		
26	39	55	65	59	55	36	62	59	28	11	7.9	5.9		
27	41	52	63	58	53	41	60	57	26	11	7.8	5.9		
28	56	49	62	56	52	38	59	57	25	11	7.6	5.9		
29	192	48	59	55	---	35	59	58	23	11	7.4	5.9		
30	190	47	59	58	---	32	65	56	22	11	7.4	5.9		
31	138	---	56	60	---	30	---	59	---	10	7.3	---		
TOTAL	1832	1905	2011	1609	1734	1242	1469	1821	1087	442	277.5	191.9		
MEAN	59.1	63.5	64.9	51.9	61.9	40.1	49.0	58.7	36.2	14.3	8.95	6.40		
MAX	192	115	133	63	74	51	88	96	52	21	10	7.5		
MIN	39	47	43	43	52	30	25	46	22	10	7.3	5.9		
CFSM	.51	.54	.56	.44	.53	.34	.42	.50	.31	.12	.08	.06		
IN.	.58	.61	.64	.51	.55	.39	.47	.58	.35	.14	.09	.06		
AC-FT	3630	3780	3990	3190	3440	2460	2910	3610	2160	877	550	381		
CAL YR 1976	TOTAL	26008.6	MEAN	71.1	MAX	1930	MIN	6.9	CFSM	.61	IN	8.27	AC-FT	51590
WTR YR 1977	TOTAL	15621.4	MEAN	42.8	MAX	192	MIN	5.9	CFSM	.37	IN	4.97	AC-FT	30990

NUECES RIVER BASIN

401

08196000 DRY FRIO RIVER NEAR REAGAN WELLS, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL./ 100 ML)
DATE	TIME	(CFS)		(UNITS)								
NOV 16...	0935	58	446	7.7	13.5	0	0	9.8	97	.3	150	27
JAN 25...	0930	65	444	7.7	12.0	0	0	10.4	100	.4	150	44
MAR 22...	0935	24	452	7.8	16.5	0	0	8.6	91	.2	140	32
MAY 24...	0900	65	437	7.5	23.0	0	0	7.6	90	.1	340	55
JUL 26...	0955	30	406	7.7	27.0	0	0	7.3	92	.1	300	150
SEP 20...	0955	5.8	414	7.9	25.5	0	0	7.6	95	.1	420	76

		FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
DATE													
NOV 16...	120	220	20	65	14	7.1	.2	.6	244	0	14	12	
JAN 25...	64	220	26	68	13	7.2	.2	.6	240	0	16	14	
MAR 22...	300	220	35	66	14	8.5	.2	.6	228	0	16	16	
MAY 24...	110	220	32	67	13	7.8	.2	.7	230	0	19	12	
JUL 26...	100	180	12	54	12	8.6	.3	.6	210	0	16	16	
SEP 20...	58	200	15	57	13	8.2	.3	.7	220	0	13	17	

		DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
DATE												
NOV 16...	.1	8.8	242	1	0	1.5	.00	.01	.18	.00	1.2	
JAN 25...	.1	8.7	246	0	0	.94	.00	.01	.15	.00	.8	
MAR 22...	.1	9.5	243	0	0	1.9	.01	.01	.16	.00	4.7	
MAY 24...	.1	9.8	243	0	0	1.4	.01	.01	.04	.10	2.5	
JUL 26...	.1	12	223	1	0	.55	.01	.00	.30	.00	2.1	
SEP 20...	.1	13	231	1	0	.36	.00	.00	.04	.00	1.7	

## NUECES RIVER BASIN

08196000 DRY FRIO RIVER NEAR REAGAN WELLS, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)						
DATE	TIME												
JAN 25...	0930	1	0	0	0	0	1						
SEP 20...	0955	0	0	0	0	0	50						
		DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)						
DATE	TIME												
JAN 25...		2	0	.1	1	0	0						
SEP 20...		0	1	.0	0	0	0						
DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	
JAN 25...	0930	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00	
SEP 20...	0955	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00	
DATE	TIME	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
JAN 25...		.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
SEP 20...		.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

NUECES RIVER BASIN

403

08197500 FRIO RIVER BELOW DRY FRIO RIVER NEAR UVALDE, TX

LOCATION.--Lat 29°14'44", long 99°40'27", Uvalde County, Hydrologic Unit 12110106, on right bank 1.1 mi (1.8 km) upstream from Farm Road 1023, 5.7 mi (9.2 km) downstream from Dry Frio River, 6.3 mi (10.1 km) downstream from bridge on U.S. Highway 90, and 7.2 mi (11.6 km) northeast of Uvalde.

DRAINAGE AREA.--661 mi<sup>2</sup> (1,712 km<sup>2</sup>).

PERIOD OF RECORD.--September 1952 to current year. Sum of records published as Frio River at Knippa and Dry Frio River at Knippa for period September 1952 to September 1953 is equivalent to record for this station.

GAGE.--Water-stage recorder. Datum of gage is 882.47 ft (268.977 m) above mean sea level.

REMARKS.--Records good. Part of flow of Frio Rivers enters the Edwards and associated limestones in the Balcones Fault Zone which crosses basin between Concan (station 08195000) and this station. Most of low flow enters this formation. Many diversions for irrigation above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--25 years, 26.2 ft<sup>3</sup>/s (0.742 m<sup>3</sup>/s), 18,980 acre-ft/yr (23.4 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 88,500 ft<sup>3</sup>/s (2,510 m<sup>3</sup>/s) Aug. 13, 1966, gage height, 23.88 ft (7.279 m), from flood-mark, from rating curve extended above 12,000 ft<sup>3</sup>/s (340 m<sup>3</sup>/s) on basis of slope-area measurements of 24,400, 53,000, and 88,500 ft<sup>3</sup>/s (691, 1,500, and 2,510 m<sup>3</sup>/s); no flow most of time each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1887, about 35 ft (10.7 m) in 1894. Flood of July 1, 1932, reached a stage of about 30 ft (9.1 m). A higher flood than that of 1894 occurred prior to 1887. Above information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,880 ft<sup>3</sup>/s (223 m<sup>3</sup>/s) Apr. 15, gage height, 9.79 ft (2.984 m), no other peak above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.25	.12	.07	.16	.00	.00	86	.00	.00	.00	.00
2	.00	.25	.12	.09	.16	.00	.00	65	.00	.00	.00	.00
3	.00	.20	.09	.09	.20	.00	.00	56	.00	.00	.00	.00
4	.00	.16	.09	.09	.16	.00	.00	46	.00	.00	.00	.00
5	.00	.09	.16	.09	.16	.00	.00	34	.00	.00	.00	.00
6	.00	.12	.16	.09	.15	.00	.00	24	.00	.00	.00	.00
7	.00	.12	.12	.09	.12	.00	.00	17	.00	.00	.00	.00
8	.00	.12	.09	.09	.13	.00	.00	11	.00	.00	.00	.00
9	.00	.09	.07	.09	.07	.00	.00	6.3	.00	.00	.00	.00
10	.00	.09	.07	.07	.04	.00	.00	3.9	.00	.00	.00	.00
11	.00	.09	.05	.07	.00	.00	.00	30	.00	.00	.00	.00
12	.00	.09	.05	.07	.00	.00	.00	37	.00	.00	.00	.00
13	.00	.12	.09	.12	.00	.00	.00	27	.00	.00	.00	.00
14	.00	.12	.16	.12	.00	.00	.00	11	.00	.00	.00	.00
15	.00	.12	.16	.09	.00	.00	1010	4.7	.00	.00	.00	.00
16	.00	.12	.16	.08	.00	.00	1940	2.7	.00	.00	.00	.00
17	.00	.20	.16	.07	.00	.00	618	2.1	.00	.00	.00	.00
18	.00	.20	.16	.07	.00	.00	309	1.9	.00	.00	.00	.00
19	.00	.20	.16	.07	.00	.00	200	1.9	.00	.00	.00	.00
20	.00	.16	.16	.07	.00	.00	424	1.9	.00	.00	.00	.00
21	.00	.20	.12	.07	.00	.00	322	1.7	.00	.00	.00	.00
22	.00	.16	.12	.13	.00	.00	243	1.5	.00	.00	.00	.00
23	.00	.16	.12	.15	.00	.00	181	1.1	.00	.00	.00	.00
24	.00	.16	.12	.15	.00	.00	148	.62	.00	.00	.00	.00
25	.00	.20	.12	.12	.00	.00	126	.40	.00	.00	.00	.00
26	.00	.20	.09	.12	.00	.00	111	.29	.00	.00	.00	.00
27	.00	.20	.09	.12	.00	.00	93	.12	.00	.00	.00	.00
28	.04	.12	.09	.12	.00	.00	81	.03	.00	.00	.00	.00
29	.45	.12	.09	.07	---	.00	76	.00	.00	.00	.00	.00
30	.53	.12	.09	.14	---	.00	83	.00	.00	.00	.00	.00
31	.37	---	.09	.17	---	.00	---	.00	---	.00	.00	---
TOTAL	1.39	4.55	3.54	3.05	1.35	.00	5965.00	475.16	.00	.00	.00	.00
MEAN	.045	.15	.11	.098	.048	.000	199	15.3	.000	.000	.000	.000
MAX	.53	.25	.16	.17	.20	.00	1940	86	.00	.00	.00	.00
MIN	.00	.09	.05	.07	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	2.8	9.0	7.0	6.0	2.7	.00	11830	942	.00	.00	.00	.00
CAL YR 1976	TOTAL	16478.89	MEAN	45.0	MAX	3070	MIN	.00	AC-FT	32690		
WTR YR 1977	TOTAL	6454.04	MEAN	17.7	MAX	1940	MIN	.00	AC-FT	12800		

## NUECES RIVER BASIN

08198000 SABINAL RIVER NEAR SABINAL, TX

LOCATION.--Lat 29°29'35", long 99°29'49", Uvalde County, Hydrologic Unit 12110106, on right bank 108 ft (33 m) upstream from concrete dam, 2.3 mi (3.7 km) downstream from mouth of Onion Creek, and 12.5 mi (20.1 km) north of Sabinal.

DRAINAGE AREA.--206 mi<sup>2</sup> (534 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1942 to current year.

REVISED RECORDS.--WSP 1312: 1943(M), 1944(M), 1947(M).

GAGE.--Water-stage recorder. Datum of gage is 1,131.20 ft (344.790 m) above mean sea level. Prior to Apr. 9, 1971, at site 0.3 mi (0.5 km) downstream at same datum.

REMARKS.--Water-discharge records good. Several small diversions above station for irrigation.

AVERAGE DISCHARGE.--35 years, 51.6 ft<sup>3</sup>/s (1.461 m<sup>3</sup>/s), 3.40 in/yr (86 mm/yr), 37,380 acre-ft/yr (46.1 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,200 ft<sup>3</sup>/s (1,560 m<sup>3</sup>/s) June 17, 1958, gage height, 28.3 ft (8.63 m), from floodmark at present site, from rating curve extended above 6,900 ft<sup>3</sup>/s (195 m<sup>3</sup>/s) on basis of slope-area measurement of 55,200 ft<sup>3</sup>/s (1,560 m<sup>3</sup>/s); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1892, about 33 ft (10.1 m) July 2, 1932, from information by local residents. There is a legend that a flood in the middle 1800's reached a stage of nearly 63 ft (19.2 m), see flood history for station 08198500.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft<sup>3</sup>/s (8.50 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Apr. 15	2400	368	10.4	5.86	1.786	May 11	0930	*1,980	56.1	7.41	2.258
Apr. 20	0500	1,060	30.0	6.71	2.045						

Minimum discharge, 20 ft<sup>3</sup>/s (0.57 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65	95	70	81	118	129	88	219	178	104	52	26
2	63	90	69	82	118	129	89	212	195	102	50	26
3	62	87	69	83	122	133	85	208	175	99	50	26
4	63	85	68	83	122	128	81	201	164	95	47	26
5	69	83	73	81	121	124	79	196	157	93	45	25
6	62	82	77	81	122	123	79	193	152	92	45	25
7	61	81	75	81	122	122	77	189	149	89	45	29
8	63	79	73	79	135	120	75	184	147	85	44	29
9	60	79	72	78	133	118	75	186	141	82	43	26
10	59	79	71	77	133	120	73	211	137	80	43	26
11	57	79	71	77	140	117	72	856	132	78	42	26
12	56	74	71	80	139	114	72	363	137	77	41	25
13	55	79	74	93	138	114	73	281	129	76	43	25
14	54	79	83	97	141	111	129	260	124	74	42	24
15	77	77	88	92	141	110	185	251	123	73	39	24
16	77	77	88	88	142	107	279	245	118	71	39	24
17	67	77	86	89	143	105	221	236	115	70	34	23
18	63	77	85	87	145	105	181	228	112	70	32	23
19	64	77	85	86	144	104	166	218	108	69	34	23
20	64	77	85	88	142	100	621	213	103	69	32	23
21	61	74	83	88	142	100	374	241	102	67	32	23
22	60	71	84	97	145	97	334	215	101	65	31	23
23	58	71	85	108	143	96	293	208	141	64	30	22
24	59	71	85	108	140	97	272	201	153	62	28	22
25	59	73	86	106	138	97	259	195	132	61	28	22
26	56	77	85	108	135	98	249	189	123	59	27	21
27	61	73	84	109	133	105	238	188	117	57	26	21
28	70	70	84	107	131	104	230	186	112	56	27	20
29	117	71	83	105	---	97	227	185	110	54	27	20
30	119	71	84	114	---	91	231	178	107	55	26	20
31	104	---	80	120	---	88	---	171	---	54	26	---
TOTAL	2085	2335	2456	2853	3768	3403	5507	7307	3994	2302	1150	718
MEAN	67.3	77.8	79.2	92.0	135	110	184	236	133	74.3	37.1	23.9
MAX	119	95	88	120	145	133	621	856	195	104	52	29
MIN	54	70	68	77	118	88	72	171	101	54	26	20
CFSM	.33	.38	.38	.45	.66	.53	.89	1.15	.65	.36	.18	.12
IN.	.38	.42	.44	.52	.68	.61	.99	1.32	.72	.42	.21	.13
AC-FT	4140	4630	4870	5660	7470	6750	10920	14490	7920	4570	2280	1420
CAL YR 1976	TOTAL	44849.3	MEAN	123	MAX	6760	MIN	5.8	CFSM	.60	IN	8.10
WTR YR 1977	TOTAL	37878.0	MEAN	104	MAX	856	MIN	20	CFSM	.51	IN	6.84
									AC-FT	88960	AC-FT	75130

NUECES RIVER BASIN

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08198000 SABINAL RIVER NEAR SABINAL, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM .7UM-MF (COL./ 100 ML)
NOV 15...	1510	72	515	7.7	14.0	0	0	10.0	100	.4	28	16
JAN 24...	1600	107	497	7.9	15.0	0	0	10.2	104	.4	40	12
MAR 21...	1450	102	502	8.1	18.5	0	0	9.8	108	.4	24	10
MAY 23...	1440	209	486	7.6	24.0	0	0	8.6	105	.1	56	19
JUL 25...	1430	62	457	8.0	28.0	0	0	8.8	113	.2	24	9
SEP 19...	1530	24	445	8.0	29.0	0	0	9.2	121	.2	42	19
	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA+MG) (MG/L)	NON-CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
NOV 15...	20	260	29	79	14	8.7	.2	1.1	276	0	24	14
JAN 24...	36	250	32	78	13	8.2	.2	1.0	264	0	23	14
MAR 21...	55	250	33	79	12	9.1	.3	1.1	260	0	23	15
MAY 23...	32	240	23	75	12	8.1	.2	1.0	260	0	23	12
JUL 25...	34	210	25	64	13	8.7	.3	1.0	230	0	23	15
SEP 19...	80	210	28	62	13	9.4	.3	1.2	220	0	24	19
	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	TOTAL NON- FILTR- ABLE RESIDUE (MG/L)	VOL. NON- FILTR- ABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	
NOV 15...	.2	12	289	0	0	1.5	.00	.01	.08	.00	1.0	
JAN 24...	.0	11	278	0	0	.45	.00	.01	.10	.00	1.4	
MAR 21...	.1	13	280	0	0	1.5	.01	.01	.02	.00	5.1	
MAY 23...	.2	12	271	1	0	1.2	.01	.01	.21	.00	.9	
JUL 25...	.2	14	252	1	0	.99	.01	.00	.10	.00	1.2	
SEP 19...	.2	14	251	1	0	.67	.00	.00	.02	.02	1.3	



NUECES RIVER BASIN  
08198000 SABINAL RIVER NEAR SABINAL, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

				DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)				
		DATE	TIME										
		JAN 24...	1600		0	100	0	0	0	10			
		SEP 19...	1530		0	0	0	0	1	10			
		DATE		DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)				
		JAN 24...		0	0	.2	1	0	0				
		SEP 19...		0	1	.0	0	2	0				
DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	
JAN 24...	1600	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00	
SEP 19...	1530	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00	
DATE	TIME	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
JAN 24...		.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.02	.00
SEP 19...		.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

## 08198500 SABINAL RIVER AT SABINAL, TX

LOCATION.--Lat 29°18'47", long 99°28'46", Uvalde County, Hydrologic Unit 12110106, on left bank 80 ft (24 m) downstream from bridge on U.S. Highway 90, 1,100 ft (335 m) downstream from Southern Pacific Lines railroad bridge, 0.8 mi (1.3 km) west of Sabinal, and 5.8 mi (9.3 km) upstream from Rancho Creek.

DRAINAGE AREA.--247 mi<sup>2</sup> (640 km<sup>2</sup>).

PERIOD OF RECORD.--September 1952 to current year.

GAGE.--Water-stage recorder. Datum of gage is 882.17 ft (268.885 m) above mean sea level. Prior to July 29, 1958, nonrecording gage, and July 29, 1958, to Mar. 19, 1964, water-stage recorder at site 80 ft (24 m) upstream at same datum.

REMARKS.--Records good. Several small diversions for irrigation above station. Most of low flow of the Sabinal River enters the Edwards and associated limestones in the Balcones Fault Zone which crosses basin upstream from this station and downstream from Sabinal River near Sabinal (station 08198000). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--25 years, 29.8 ft<sup>3</sup>/s (0.844 m<sup>3</sup>/s), 21,590 acre-ft/yr (26.6 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 73,300 ft<sup>3</sup>/s (2,080 m<sup>3</sup>/s) June 17, 1958, gage height, 33.3 ft (10.15 m); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1890, 40 ft (12.2 m) Aug. 24, 1919, from information by local residents. Flood of July 2, 1932, reached a stage of 31 ft (9.4 m), discharge 60,000 ft<sup>3</sup>/s (1,700 m<sup>3</sup>/s), from information by Southern Pacific Lines. There is a legend that a flood in 1858 covered the townsite of Sabinal. The stage would have been 70 to 80 ft (21.3 to 24.4 m) which seems unlikely. However, it is possible that a flood occurred in 1858 that covered part of the townsite and was higher than any flood since that date.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 16	1200	212	6.00	5.90	1.798		
Apr. 20	1300	869	24.6	7.80	2.377	May 11	1600
						*1,690	47.9
						9.28	2.829

Minimum discharge, 1.4 ft<sup>3</sup>/s (0.040 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.9	13	4.8	4.8	37	48	12	128	95	16	3.9	2.1
2	5.7	11	4.9	4.8	36	49	11	115	115	14	3.9	2.1
3	5.5	8.8	5.0	4.8	38	50	10	112	97	12	4.0	1.9
4	5.8	7.6	4.8	4.8	38	49	9.4	108	85	11	3.9	2.0
5	5.9	6.8	5.1	4.8	37	45	8.6	100	78	10	3.7	2.1
6	5.5	6.3	5.5	4.7	36	42	8.1	95	69	9.2	3.6	2.1
7	5.5	5.9	5.3	4.6	36	40	7.8	92	68	8.9	3.6	2.3
8	5.4	5.9	5.3	4.6	42	38	7.6	89	63	8.2	3.5	2.2
9	5.3	5.7	5.3	4.5	49	37	7.6	87	60	7.7	3.5	2.2
10	5.1	5.7	5.1	4.4	49	36	7.3	100	55	7.3	3.5	2.2
11	4.9	5.4	5.1	4.4	52	35	6.7	603	50	7.0	3.4	2.2
12	4.8	5.0	5.1	4.4	53	31	6.6	440	48	6.7	3.2	2.0
13	4.7	5.3	5.1	4.4	50	29	6.4	246	49	6.5	3.5	2.0
14	4.6	5.3	5.1	4.3	51	28	6.7	202	42	6.3	3.4	2.0
15	4.4	5.3	5.1	4.2	52	27	6.5	184	37	6.1	3.4	2.0
16	4.4	5.5	5.1	4.2	52	25	122	177	34	5.8	3.3	1.8
17	4.4	5.3	5.1	4.1	54	22	151	168	31	5.8	3.2	1.8
18	4.4	5.3	5.1	4.1	56	21	104	159	28	5.6	3.1	1.7
19	4.2	5.3	5.1	4.1	56	19	82	149	25	5.6	3.1	1.8
20	4.2	5.3	5.0	4.2	55	18	400	143	22	5.4	3.1	1.9
21	4.2	5.2	5.0	4.9	54	16	337	153	20	5.3	3.0	1.9
22	4.1	5.1	5.0	8.7	55	16	270	158	18	5.2	2.8	1.9
23	4.1	5.0	4.8	18	55	15	214	138	24	4.9	2.9	1.9
24	4.1	5.1	4.8	23	53	14	183	128	63	4.8	2.8	1.8
25	4.1	5.1	4.8	22	52	14	164	120	51	4.6	2.8	1.7
26	4.0	5.1	4.8	21	51	15	152	113	36	4.6	2.6	1.6
27	4.4	5.1	4.8	21	49	16	142	110	28	4.5	2.5	1.6
28	4.5	5.0	4.8	22	49	18	135	108	22	4.4	2.5	1.6
29	6.7	4.8	4.9	20	---	19	131	107	19	4.2	2.5	1.6
30	5.2	4.8	4.8	25	---	16	141	104	17	4.1	2.3	1.5
31	5.5	---	4.8	35	---	13	---	98	---	4.0	2.2	---
TOTAL	151.5	180.0	155.3	309.8	1347	861	2850.3	4834	1449	215.7	98.7	57.5
MEAN	4.89	6.00	5.01	9.99	48.1	27.8	95.0	156	48.3	6.96	3.18	1.92
MAX	6.7	13	5.5	35	56	50	400	603	115	16	4.0	2.3
MIN	4.0	4.8	4.8	4.1	36	13	6.4	87	17	4.0	2.2	1.5
AC-FT	301	357	308	614	2670	1710	5650	9590	2870	428	196	114
CAL YR 1976	TOTAL	24998.21	MEAN	68.3	MAX	7660	MIN	.46	AC-FT	49580		
WTR YR 1977	TOTAL	12509.80	MEAN	34.3	MAX	603	MIN	1.5	AC-FT	24810		

## NUECES RIVER BASIN

08200000 HONDO CREEK NEAR TARPLEY, TX

LOCATION.--Lat 29°34'10", long 99°14'47", Medina County, Hydrologic Unit 12110107, on left bank 460 ft (140 m) downstream from bridge on Ranch Road 462, 6.3 mi (10.1 km) southeast of Tarpley, and 16.6 mi (26.7 km) northwest of Hondo.

DRAINAGE AREA.--86.2 mi<sup>2</sup> (223.3 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1952 to current year.

REVISED RECORDS.--WSP 1712: 1957.

GAGE.--Water-stage recorder. Datum of gage is 1,169.1 ft (356.34 m) above mean sea level (Magnolia Oil Co. bench mark).

REMARKS.--Water-discharge records good. Several small diversions for irrigation above station.

AVERAGE DISCHARGE.--25 years, 38.5 ft<sup>3</sup>/s (1.090 m<sup>3</sup>/s), 6.07 in/yr (154 mm/yr), 27,890 acre-ft/yr (34.4 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 69,800 ft<sup>3</sup>/s (1,980 m<sup>3</sup>/s) June 17, 1958, gage height, 28.2 ft (8.60 m), from floodmark, from rating curve extended above 2,600 ft<sup>3</sup>/s (73.6 m<sup>3</sup>/s) on basis of slope-area measurements of 18,600 and 69,800 ft<sup>3</sup>/s (527 and 1,980 m<sup>3</sup>/s); no flow at times in 1952-57, 1962-64, 1967, and 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1907, that of June 17, 1958. Flood in July 1932, reached a stage of about 26 ft (7.9 m), discharge 58,500 ft<sup>3</sup>/s (1,660 m<sup>3</sup>/s), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft<sup>3</sup>/s (14.2 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)	Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)
Oct. 15	1800	1,070	30.3	4.08	1.244	May 11	0300	*13,500	382	13.00	3.962
Oct. 29	1100	550	15.6	3.28	1.000	May 21	0800	698	19.5	3.53	1.076
May 9	1800	4,540	129	7.08	2.158						

Minimum discharge, 4.7 ft<sup>3</sup>/s (0.13 m<sup>3</sup>/s) Sept. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	21	220	65	76	104	74	40	68	154	56	21	9.0		
2	20	196	64	76	110	73	40	66	165	51	20	8.6		
3	20	182	63	73	108	74	38	65	118	51	19	8.6		
4	29	168	63	72	106	72	36	63	112	49	18	8.6		
5	39	148	96	70	104	68	35	60	100	48	18	7.9		
6	22	136	92	73	104	65	35	60	106	47	18	8.6		
7	23	122	85	68	102	63	34	59	102	44	16	14		
8	23	115	85	66	124	62	34	57	96	43	16	11		
9	21	112	86	66	108	62	33	520	91	42	16	9.6		
10	20	108	88	62	110	60	33	123	80	42	16	8.2		
11	20	100	96	62	120	58	32	1780	85	40	15	7.9		
12	19	96	90	69	112	56	32	342	86	38	15	7.9		
13	19	100	96	90	110	55	32	302	85	38	18	8.2		
14	19	91	108	86	110	54	40	272	74	37	16	7.9		
15	156	86	102	86	108	54	39	255	69	34	14	6.8		
16	62	84	100	85	104	52	61	244	68	34	14	6.8		
17	44	86	102	85	104	51	51	224	66	35	14	6.5		
18	41	80	106	84	102	50	46	214	65	34	13	6.5		
19	47	82	106	84	98	47	51	199	62	32	13	7.2		
20	46	76	101	84	97	46	65	190	60	31	13	10		
21	44	72	98	82	96	45	90	314	60	29	12	6.8		
22	44	69	97	104	96	44	82	230	59	28	12	6.5		
23	46	68	96	118	91	43	79	208	167	26	12	5.9		
24	72	69	96	108	86	44	74	199	98	24	13	5.9		
25	52	76	94	108	86	44	74	188	76	24	10	5.9		
26	50	73	90	110	84	48	75	180	69	24	9.0	5.6		
27	57	68	88	110	79	56	73	175	64	24	8.6	5.3		
28	79	65	85	108	78	46	70	170	60	23	9.6	5.3		
29	335	65	82	104	---	43	70	165	59	22	10	5.0		
30	283	65	80	124	---	41	73	152	57	21	10	5.0		
31	244	---	76	110	---	280	---	142	---	20	9.3	---		
TOTAL	2017	3078	2776	2703	2841	1690	1567	7286	2613	1091	438.5	227.0		
MEAN	65.1	103	89.5	87.2	101	54.5	52.2	235	87.1	35.2	14.1	7.57		
MAX	335	220	108	124	124	74	90	1780	167	56	21	14		
MIN	19	65	63	62	78	40	32	57	57	20	8.6	5.0		
CFSM	.76	1.20	1.04	1.01	1.17	.63	.61	2.73	1.01	.41	.16	.09		
IN.	.87	1.33	1.20	1.17	1.23	.73	.68	3.14	1.13	.47	.19	.10		
AC-FT	4000	6110	5510	5360	5640	3350	3110	14450	5180	2160	870	450		
CAL YR 1976	TOTAL	22388.0	MEAN	61.2	MAX	1660	MIN	2.9	CFSM	.71	IN	9.66	AC-FT	44410
WTR YR 1977	TOTAL	28327.5	MEAN	77.6	MAX	1780	MIN	5.0	CFSM	.90	IN	12.22	AC-FT	56190

NUECES RIVER BASIN

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08200000 HONDO CREEK NEAR TARPLEY, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM .7UM-MF (COL./ 100 ML)
DATE	TIME											
NOV 15...	1245	80	497	7.7	13.5	0	0	10.4	103	.3	13	8
JAN 24...	1315	120	487	7.8	14.5	0	0	10.2	103	.4	60	35
MAR 21...	1230	45	501	8.0	19.0	0	0	9.6	107	.4	20	15
MAY 23...	1220	200	484	7.5	24.0	0	0	8.4	102	.1	130	37
JUL 25...	1215	45	444	7.9	28.0	0	0	8.4	108	.2	820	31
SEP 19...	1255	6.5	429	8.1	29.0	0	0	8.6	113	.1	120	8
	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
DATE	100 ML)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)		(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)
NOV 15...	60	250	29	83	11	7.3	.2	1.1	272	0	25	9.9
JAN 24...	63	240	27	81	10	7.5	.2	1.1	264	0	26	11
MAR 21...	120	240	25	76	11	9.6	.3	1.1	256	0	29	15
MAY 23...	24	230	21	78	9.5	7.5	.2	1.2	260	0	24	12
JUL 25...	300	210	30	66	11	9.8	.3	1.1	220	0	30	15
SEP 19...	240	200	43	60	12	11	.3	1.3	190	0	38	19
	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	
DATE	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	
NOV 15...	.2	11	283	0	0	.88	.00	.01	.07	.00	1.0	
JAN 24...	.0	11	278	1	0	.22	.00	.00	.09	.00	--	
MAR 21...	.2	12	280	1	0	.98	.01	.01	.09	.00	4.7	
MAY 23...	.2	11	272	1	0	.80	.01	.01	.44	.00	.3	
JUL 25...	.2	14	255	1	0	.51	.01	.00	.10	.01	1.4	
SEP 19...	.3	15	250	1	0	.39	.00	.00	.20	.01	1.6	

NUECES RIVER BASIN  
08200000 HONDO CREEK NEAR TARPLEY, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	DIS-SOLVED CAD- MIUM (CD) (UG/L)	DIS-SOLVED CHRO- MIUM (CR) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)
JAN 24...	1315	0	0	0	0	0	10
SEP 19...	1255	0	0	0	0	0	10

DATE	DIS-SOLVED LEAD (PB) (UG/L)	DIS-SOLVED MAN- GANESE (MN) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	DIS-SOLVED SELE- NIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
JAN 24...	0	10	.2	1	0	0
SEP 19...	1	0	.0	0	0	0

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
JAN 24...	1315	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
SEP 19...	1255	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
JAN 24...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
SEP 19...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00

## 08200700 HONDO CREEK AT KING WATERHOLE NEAR HONDO, TX

LOCATION.--Lat 29°23'26", long 99°09'04", Medina County, Hydrologic Unit 12110107, on left bank 0.3 mi (0.5 km) downstream from county road low-water crossing, 3.1 mi (5.0 km) north of Hondo, and 7.8 mi (12.6 km) upstream from Verde Creek.

DRAINAGE AREA.--142 mi<sup>2</sup> (368 km<sup>2</sup>).

PERIOD OF RECORD.--October 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 897.87 ft (273.671 m) above mean sea level.

REMARKS.--Records good except those below 4 ft<sup>3</sup>/s (0.11 m<sup>3</sup>/s), which are fair. Most of the low flow of Hondo Creek enters Edwards and associated limestones in the Balcones Fault Zone which crosses basin between Tarpley (station 08200000) and this station. Small diversions above station for irrigation, amounts unknown. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years, 14.2 ft<sup>3</sup>/s (0.402 m<sup>3</sup>/s), 10,290 acre-ft/yr (12.7 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 46,900 ft<sup>3</sup>/s (1,330 m<sup>3</sup>/s) July 15, 1973, gage height, 16.4 ft (5.00 m), from flood-mark, from rating curve extended above 9,800 ft<sup>3</sup>/s (278 m<sup>3</sup>/s) on basis of contracted-opening measurement of peak flow; no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1875, 21 ft (6.4 m) in September 1919, from information by local resident. Other floods occurred in July 1932, stage 18 ft (5.5 m) and June 17, 1958, stage 17 ft (5.2 m).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft<sup>3</sup>/s (14.2 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 15	2130	2,690	76.2	5.24	1.597	May 11	0730	*13,400	379	9.40	2.865
May 9	2330	1,320	37.4	4.22	1.286						

Minimum discharge, 0.01 ft<sup>3</sup>/s (0.0003 m<sup>3</sup>/s) Feb. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	6.7	.19	.04	.01	.08	.08	.05	.06	.40	.06	.05
2	.03	4.0	.18	.04	.02	.08	.08	.05	.05	.36	.06	.05
3	.03	2.5	.17	.03	.04	.15	.10	.05	.05	.32	.06	.04
4	.25	1.5	.16	.03	.04	.14	.14	.05	.04	.30	.06	.04
5	.20	1.0	.25	.02	.03	.14	.12	.04	.04	.27	.06	.04
6	.12	.50	.24	.04	.03	.13	.11	.04	.04	.25	.06	.04
7	.07	.30	.22	.03	.03	.13	.10	.04	.03	.23	.06	.10
8	.05	.15	.20	.03	.03	.12	.09	.04	.03	.21	.06	.09
9	.04	.10	.18	.03	.05	.12	.08	40	.03	.19	.06	.08
10	.04	.09	.17	.02	.10	.11	.07	139	.03	.17	.05	.07
11	.04	.08	.16	.02	.15	.11	.07	1340	.03	.16	.05	.06
12	.03	.08	.25	.02	.14	.10	.07	69	.05	.15	.05	.06
13	.03	.30	.35	.05	.14	.10	.06	33	.04	.14	.05	.05
14	.03	.25	.30	.04	.13	.10	.06	21	.04	.13	.05	.05
15	180	.25	.20	.04	.12	.09	.06	13	.03	.12	.05	.08
16	120	.25	.15	.04	.12	.09	.10	7.7	.03	.11	.05	.07
17	.50	.50	.12	.03	.11	.09	.09	3.1	.03	.10	.05	.06
18	.30	.50	.09	.03	.11	.08	.08	.67	.03	.10	.05	.05
19	.20	.50	.08	.03	.11	.08	.30	.50	.02	.09	.07	.12
20	.15	.50	.06	.02	.10	.08	1.0	.40	.02	.09	.06	.10
21	.13	.45	.05	.02	.10	.08	.70	12	.02	.09	.06	.09
22	.10	.40	.05	.03	.10	.08	.50	6.5	.10	.08	.06	.15
23	.08	.35	.04	.04	.09	.08	.30	.66	.50	.08	.06	.13
24	.20	.30	.04	.05	.09	.07	.20	.50	1.0	.08	.05	.12
25	.30	.35	.04	.04	.09	.07	.15	.30	.85	.08	.05	.10
26	.40	.40	.04	.03	.08	.07	.10	.20	.75	.07	.05	.09
27	.60	.35	.04	.02	.08	.07	.07	.15	.65	.07	.05	.08
28	1.0	.30	.03	.02	.08	.08	.06	.12	.55	.07	.05	.08
29	85	.25	.03	.02	---	.09	.06	.10	.50	.07	.05	.07
30	48	.20	.03	.03	---	.10	.06	.08	.45	.07	.05	.07
31	23	---	.03	.03	---	.09	---	.07	---	.07	.05	---
TOTAL	460.95	23.40	4.14	.96	2.32	3.00	5.06	1688.41	6.09	4.72	1.70	2.28
MEAN	14.9	.78	.13	.031	.083	.097	.17	54.5	.20	.15	.055	.076
MAX	180	6.7	.35	.05	.15	.15	1.0	1340	1.0	.40	.07	.15
MIN	.03	.08	.03	.02	.01	.07	.06	.04	.02	.07	.05	.04
AC-FT	914	46	8.2	1.9	4.6	6.0	10	3350	12	9.4	3.4	4.5
CAL YR 1976	TOTAL	4333.67	MEAN	11.8	MAX	2250	MIN	.00	AC-FT	8600		
WTR YR 1977	TOTAL	2203.03	MEAN	6.04	MAX	1340	MIN	.01	AC-FT	4370		



## NUECES RIVER BASIN

08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX

LOCATION.--Lat 29°34'23", long 99°24'10", Medina County, Hydrologic Unit 12110107, on right bank 200 ft (61 m) upstream from county road crossing, 4.5 mi (7.2 km) downstream from Cascade Creek, and 7.9 mi (12.7 km) southeast of Utopia.

DRAINAGE AREA.--43.1 mi<sup>2</sup> (111.6 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1961 to current year.

GAGE.--Water-stage recorder, crest-stage gages, and concrete control. Datum of gage is 1,265.8 ft (385.82 m) above mean sea level, adjustment unknown (Magnolia Oil Co. bench mark).

REMARKS.--Water-discharge records good except those for period of no gage-height record, which are fair. No known diversion above station.

AVERAGE DISCHARGE.--16 years, 19.0 ft<sup>3</sup>/s (0.538 m<sup>3</sup>/s), 5.99 in/yr (152 mm/yr), 13,770 acre-ft/yr (17.0 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,500 ft<sup>3</sup>/s (1,090 m<sup>3</sup>/s) July 15, 1973, gage height, 14.4 ft (4.39 m), from floodmark, from rating curve extended above 910 ft<sup>3</sup>/s (25.8 m<sup>3</sup>/s) on basis of field estimate of flow over and around end of dam, 14,100 ft<sup>3</sup>/s (399 m<sup>3</sup>/s), and slope-area measurement of 52,600 ft<sup>3</sup>/s (1,490 m<sup>3</sup>/s); no flow for many days in 1963-64.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1901, 16.4 ft (5.00 m) June 17, 1958, from floodmarks, discharge 52,600 ft<sup>3</sup>/s (1,490 m<sup>3</sup>/s), by slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,460 ft<sup>3</sup>/s (98.0 m<sup>3</sup>/s) May 11, gage height, 5.35 ft (1.631 m), from rating curve extended as explained above, no other peak above base of 600 ft<sup>3</sup>/s (17.0 m<sup>3</sup>/s); minimum daily, 1.5 ft<sup>3</sup>/s (0.042 m<sup>3</sup>/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.4	34	19	20	33	26	14	39	75	25	5.4	2.4
2	6.1	33	19	20	34	25	15	35	68	23	5.4	2.4
3	6.1	31	18	20	35	26	14	35	54	22	5.3	2.4
4	7.8	30	18	20	35	25	14	34	49	21	5.0	2.3
5	9.3	28	23	20	35	24	14	32	47	20	4.7	2.3
6	6.4	28	22	20	35	24	13	31	45	19	4.6	2.3
7	6.5	27	20	19	35	23	13	30	44	18	4.2	2.6
8	7.1	26	20	19	39	23	13	30	42	17	4.0	2.3
9	6.0	25	20	19	35	21	12	37	39	16	3.9	2.3
10	5.7	25	20	18	35	21	12	29	36	15	3.8	2.3
11	5.7	25	22	17	39	21	11	401	37	14	3.8	2.3
12	5.3	24	21	18	36	20	11	109	38	13	4.2	2.3
13	5.3	26	22	21	36	20	11	96	33	13	6.5	2.4
14	5.3	23	26	21	36	19	22	90	31	12	3.8	2.3
15	26	22	24	20	35	19	19	88	30	12	3.2	2.3
16	15	21	24	21	35	20	49	81	29	11	3.1	2.2
17	12	23	24	20	35	20	39	75	28	10	3.1	2.1
18	11	21	25	20	35	20	32	71	27	10	3.1	2.1
19	14	21	25	20	34	19	43	67	25	9.5	3.1	2.5
20	13	20	25	20	33	19	72	66	24	9.0	2.8	2.0
21	11	19	24	20	33	19	70	100	25	8.7	2.8	1.8
22	10	19	24	26	31	18	68	76	27	8.4	2.7	1.8
23	10	18	24	30	30	18	60	71	42	8.3	2.6	1.8
24	10	18	23	28	28	18	55	68	36	7.3	2.6	1.7
25	10	20	24	28	28	18	51	63	33	7.0	2.6	1.7
26	9.6	21	23	29	27	19	47	61	31	6.9	2.3	1.7
27	13	20	23	31	27	23	45	60	30	6.5	2.4	1.6
28	16	19	23	31	27	19	42	57	28	6.4	2.4	1.6
29	44	19	23	30	---	17	42	54	27	5.9	2.4	1.6
30	40	19	23	36	---	16	41	52	25	6.0	2.4	1.5
31	37	---	20	35	---	15	---	50	---	5.6	2.4	---
TOTAL	390.6	705	691	717	936	635	964	2188	1105	386.5	110.6	62.9
MEAN	12.6	23.5	22.3	23.1	33.4	20.5	32.1	70.6	36.8	12.5	3.57	2.10
MAX	44	34	26	36	39	26	72	401	75	25	6.5	2.6
MIN	5.3	18	18	17	27	15	11	29	24	5.6	2.3	1.5
CFSM	.29	.55	.52	.54	.78	.48	.75	1.64	.85	.29	.08	.05
IN.	.34	.61	.60	.62	.81	.55	.83	1.89	.95	.33	.10	.05
AC-FT	775	1400	1370	1420	1860	1260	1910	4340	2190	767	219	125

CAL YR 1976	TOTAL	7833.2	MEAN	21.4	MAX	340	MIN	1.2	CFSM	.50	IN	6.76	AC-FT	15540
WTR YR 1977	TOTAL	8891.6	MEAN	24.4	MAX	401	MIN	1.5	CFSM	.57	IN	7.67	AC-FT	17640

NOTE.--No gage-height record Sept. 1-30.

NUECES RIVER BASIN

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08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM .7UM-MF (COL./ 100 ML)
DATE	TIME	(CFS)		(UNITS)								
NOV 15...	1355	20	470	7.8	15.0	0	0	9.9	101	.3	10	3
JAN 24...	1430	30	474	7.9	16.0	0	0	10.4	108	.5	24	6
MAR 21...	1335	22	474	8.0	19.0	0	0	10.0	111	.3	28	16
MAY 23...	1335	70	472	7.7	26.0	0	0	8.2	102	.1	200	80
JUL 25...	1325	8.0	406	8.2	31.5	0	0	8.8	119	.1	26	11
SEP 19...	1415	3.0	362	8.2	34.5	0	0	9.4	132	.6	79	26
	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
DATE	100 ML	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)		(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)
NOV 15...	16	230	37	74	12	7.3	.2	.8	240	0	33	11
JAN 24...	22	240	40	75	12	7.1	.2	1.0	240	0	35	11
MAR 21...	76	230	62	75	11	8.6	.2	1.0	208	0	36	15
MAY 23...	580	250	43	81	11	7.2	.2	1.0	250	0	29	12
JUL 25...	43	190	35	60	10	8.4	.3	.9	190	0	32	15
SEP 19...	60	160	40	47	11	8.7	.3	1.3	150	0	35	17
	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SIO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	
DATE	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	(MG/L)	
NOV 15...	.2	11	268	1	0	1.0	.00	.01	.09	.00	2.0	
JAN 24...	.0	11	271	2	1	.40	.00	.00	.14	.00	1.8	
MAR 21...	.1	12	261	1	0	1.0	.00	.01	.13	.00	7.2	
MAY 23...	.2	12	277	0	0	.80	.01	.01	.54	.00	.7	
JUL 25...	.2	14	234	1	0	.56	.01	.00	.10	.02	.6	
SEP 19...	.2	14	208	2	1	.48	.00	.00	.18	.01	1.2	

## NUECES RIVER BASIN

08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
JAN 24...	1430	0	100	0	0	0	1
SEP 19...	1415	0	0	0	0	0	20

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
JAN 24...	0	0	.2	1	0	0
SEP 19...	0	1	.0	0	0	10

DATE	TIME	TOTAL PCB (UG/L)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)
JAN 24...	1430	.0	.00	.00	.0	.00	.00	.00	.00	.00	.00	.00
SEP 19...	1415	--	--	--	--	--	--	--	.00	--	--	.00

DATE	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
JAN 24...	.00	.00	.00	.00	.00	.00	.00	0	.00	.00	.00	.00
SEP 19...	--	--	--	.00	.00	.00	.00	--	.00	.00	.00	.00

NUECES RIVER BASIN

415

08202700 SECO CREEK AT ROWE RANCH NEAR D'HANIS, TX

LOCATION.--Lat 29°21'43", long 99°17'05", Medina County, Hydrologic Unit 12110107, on left bank 2.9 mi (4.7 km) north of D'Hanis and 8.0 mi (12.9 km) downstream from Rocky Creek.

DRAINAGE AREA.--168 mi<sup>2</sup> (435 km<sup>2</sup>).

PERIOD OF RECORD.--November 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 900.88 ft (274.588 m) above mean sea level. Prior to October 1970, published as "at Crook Ranch, near D'Hanis".

REMARKS.--Records fair. All of low flow of Seco Creek enters Edwards and associated limestones in the Balcones Fault Zone which crosses basin between Miller Ranch (station 08201500) and this station. No known diversion above station.

AVERAGE DISCHARGE.--16 years (water years 1962-77), 9.01 ft<sup>3</sup>/s (0.255 m<sup>3</sup>/s), 6,530 acre-ft/yr (8.05 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,500 ft<sup>3</sup>/s (864 m<sup>3</sup>/s) July 15, 1973, gage height, 26.0 ft (7.92 m), from floodmark, from rating curve extended above 16,000 ft<sup>3</sup>/s (453 m<sup>3</sup>/s) on the basis of slope-area measurement of 35,800 ft<sup>3</sup>/s (1,010 m<sup>3</sup>/s); no flow most of time each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1852, 35.7 ft (10.88 m) May 31, 1935, from information by local resident. Other floods occurred Aug. 31, 1894, 33 ft (10.1 m); September 1919, 28 ft (8.5 m); July 2, 1932, 28.2 ft (8.60 m), discharge 35,800 ft<sup>3</sup>/s (1,010 m<sup>3</sup>/s), by slope-area measurement; June 17, 1958, 32.4 ft (9.88 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 568 ft<sup>3</sup>/s (16.1 m<sup>3</sup>/s) May 11, gage height, 9.40 ft (2.865 m), no peak above base of 600 ft<sup>3</sup>/s (17.0 m<sup>3</sup>/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.97	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.48	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	104	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	9.2	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.61	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.08	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.73	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	11	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	2.0	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	13.73	1.70	.00	.00	.00	.00	.00	113.89	.00	.00	.00	.00
MEAN	.44	.057	.000	.000	.000	.000	.000	3.67	.000	.000	.000	.000
MAX	11	.97	.00	.00	.00	.00	.00	104	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	27	3.4	.00	.00	.00	.00	.00	226	.00	.00	.00	.00
CAL YR 1976	TOTAL	1911.54	MEAN	5.22	MAX	1510	MIN	.00	AC-FT	3790		
WTR YR 1977	TOTAL	129.32	MEAN	.35	MAX	104	MIN	.00	AC-FT	257		

## NUECES RIVER BASIN

08205500 FRIO RIVER NEAR DERBY, TX

LOCATION.--Lat 28°44'11", long 99°08'40", Frio County, Hydrologic Unit 12110106, on right bank 17 ft (5 m) downstream from centerline of railroad tracks, 35 ft (11 m) right of the Missouri Pacific Railroad Co. bridge abutment, 167 ft (51 m) downstream from Interstate Highway 35, 917 ft (280 m) downstream from Leona River, 2.5 mi (4.0 km) south of Derby, and 122.4 mi (196.9 km) upstream from mouth.

DRAINAGE AREA.--3,493 mi<sup>2</sup> (9,047 km<sup>2</sup>).

PERIOD OF RECORD.--August 1915 to current year.

REVISED RECORDS.--WSP 568: 1915-16, 1918-22. WSP 763: Drainage area. WSP 1312: 1917-18(M), 1920-21(M). WSP 1923: 1954.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 449.11 ft (136.889 m) above mean sea level. Aug. 1, 1915, to Apr. 21, 1931, nonrecording gage, and Apr. 22, 1931, to Mar. 6, 1940, water-stage recorder at same site and datum. Mar. 7, 1940, to May 4, 1972, water-stage recorder, and May 5 to Nov. 1, 1972, nonrecording gage at site 167 ft (51 m) upstream at same datum.

REMARKS.--Records good. Part of flow of Frio River and its headwater tributaries enters the Edwards and associated limestones in the Balcones Fault Zone upstream from U.S. Highway 90 (see REMARKS for stations 08197500, 08198500, 08200700, and 08202700). Considerable loss of flow into various permeable formations occurs downstream from the Balcones Fault Zone. Many small diversions for irrigation above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--62 years, 137 ft<sup>3</sup>/s (3.880 m<sup>3</sup>/s), 99,260 acre-ft/yr (122 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 230,000 ft<sup>3</sup>/s (6,510 m<sup>3</sup>/s) July 4, 1932, gage height, 29.45 ft (8.976 m), from flood-marks, from rating curve extended above 76,000 ft<sup>3</sup>/s (2,150 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1860, that of July 4, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,100 ft<sup>3</sup>/s (31.2 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Apr. 18	0200	*1,930 54.7	5.56 1.695	May 13	1800	1,740 49.3	5.19 1.582
Apr. 22	1000	1,890 53.5	5.49 1.673				

Minimum discharge, 36 ft<sup>3</sup>/s (1.02 m<sup>3</sup>/s) Sept. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	182	601	179	207	256	247	169	445	284	125	64	53
2	154	434	179	207	302	249	166	447	271	124	65	53
3	140	340	179	206	305	251	160	437	269	119	66	51
4	138	271	179	205	295	252	159	405	273	115	61	51
5	158	240	182	207	293	251	159	387	261	110	57	52
6	333	220	192	210	282	253	162	375	239	107	60	52
7	316	203	222	214	271	245	163	361	222	105	60	51
8	213	192	243	214	268	233	150	347	213	103	58	50
9	169	188	221	214	264	230	143	337	204	98	55	51
10	152	180	208	212	267	232	141	333	194	97	56	57
11	145	180	207	207	285	234	142	406	184	94	60	59
12	141	176	215	204	291	233	145	663	174	87	62	55
13	140	176	251	205	299	235	166	1420	165	87	58	53
14	138	177	268	218	294	224	183	957	161	85	59	51
15	149	181	356	240	281	208	157	651	158	79	58	52
16	169	183	422	245	273	198	209	583	154	79	58	54
17	547	191	332	230	269	197	1090	511	145	79	57	55
18	429	207	283	219	268	192	1510	480	138	79	57	56
19	212	249	261	211	267	189	811	451	134	83	55	54
20	169	252	250	207	264	186	624	419	127	84	53	49
21	172	254	245	207	265	178	795	397	121	83	56	46
22	182	236	233	212	267	174	1540	386	116	83	55	45
23	166	218	223	218	264	170	924	383	114	81	59	42
24	163	197	218	240	270	167	692	396	117	76	59	42
25	169	195	218	261	275	166	605	373	290	73	58	45
26	275	204	218	263	266	168	543	347	245	71	56	45
27	211	211	223	257	257	170	500	331	195	69	53	43
28	197	218	220	247	253	171	472	319	158	69	53	48
29	319	211	214	242	---	176	448	311	152	64	53	44
30	550	189	214	239	---	175	442	303	135	64	53	43
31	920	---	212	238	---	170	---	292	---	62	53	---
TOTAL	7518	6974	7267	6906	7711	6424	13570	14253	5613	2734	1787	1502
MEAN	243	232	234	223	275	207	452	460	187	88.2	57.6	50.1
MAX	920	601	422	263	305	253	1540	1420	290	125	66	59
MIN	138	176	179	204	253	166	141	292	114	62	53	42
AC-FT	14910	13830	14410	13700	15290	12740	26920	28270	11130	5420	3540	2980
CAL YR 1976	TOTAL	100571	MEAN	275	MAX	4640	MIN	30	AC-FT	199500		
WTR YR 1977	TOTAL	82259	MEAN	225	MAX	1540	MIN	42	AC-FT	163200		

## 08206700 SAN MIGUEL CREEK NEAR TILDEN, TX

LOCATION.--Lat 28°35'14", long 98°32'44", McMullen County, Hydrologic Unit 12110109, on left bank 25 ft (8 m) downstream from State Highway 16, 0.3 mi (0.5 km) upstream from mouth of Bruce Branch, 0.9 mi (1.4 km) downstream from mouth of Far Live Oak Creek, 3 mi (5 km) upstream from San Patricio Creek, 7 mi (11 km) downstream from Clear Creek, 8.7 mi (14.0 km) north of Tilden, and 13 mi (21 km) upstream from mouth.

DRAINAGE AREA.--793 mi<sup>2</sup> (2,054 km<sup>2</sup>).

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 242.95 ft (74.051 m) above mean sea level.

REMARKS.--Records good. There are five diversions above station, but amounts are unknown. At times, excess water from Bexar-Medina-Atascosa Counties Water Improvement District No. 1 system enters San Miguel Creek basin via Chacon Creek 52 mi (84 km) upstream (amounts unknown). Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--13 years, 68.7 ft<sup>3</sup>/s (1.946 m<sup>3</sup>/s), 49,770 acre-ft/yr (61.4 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,400 ft<sup>3</sup>/s (436 m<sup>3</sup>/s) Apr. 15, 1977, gage height, 27.00 ft (8.230 m); no flow at times in 1964-67, 1969-74.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1919, 32.6 ft (9.94 m) in 1942; stage of 1919 flood not known, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 900 ft<sup>3</sup>/s (25.5 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 5	1500	2,000	56.6	14.32	4.365		
Oct. 30	0800	2,010	56.9	14.34	4.371		
Apr. 13	2300	13,500	382	25.87	7.885		
Apr. 15	2200	*15,400	436	a27.00	8.230		
Apr. 20	0900	5,860	166	20.07	6.117		
Apr. 23	1200	1,420	40.2	12.61	3.844		
May 13	2400	1,120	31.7	11.35	3.459		

a From high-water mark.

Minimum discharge, 0.03 ft<sup>3</sup>/s (0.001 m<sup>3</sup>/s) for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	681	31	16	17	9.5	5.2	128	17	10	1.3	.05
2	15	270	26	16	30	14	6.6	85	16	8.4	1.0	.03
3	6.2	75	23	15	47	17	5.8	53	15	7.1	.75	.03
4	15	53	22	14	33	15	4.7	50	14	5.8	.61	.03
5	1380	42	21	14	27	11	4.3	42	12	5.2	.52	.03
6	301	35	21	13	27	10	3.7	38	13	4.3	.48	.03
7	173	31	23	13	24	9.0	3.4	35	12	4.0	.44	.03
8	148	27	24	13	21	13	3.2	33	11	3.9	.33	.03
9	32	25	21	13	18	13	12	32	9.7	3.8	.27	.03
10	20	24	26	13	17	12	6.2	29	10	4.3	.26	.03
11	13	22	24	13	21	10	4.8	29	15	4.0	.23	.03
12	9.5	21	23	21	17	9.0	4.3	276	11	3.4	.18	.04
13	7.3	21	22	62	13	10	2020	760	11	3.1	.18	.05
14	6.6	20	253	32	13	11	4910	579	12	2.5	.16	.05
15	23	19	273	22	16	10	5160	105	13	2.5	.14	51
16	193	19	219	33	17	16	7730	68	11	2.5	.13	377
17	253	25	140	33	16	12	1440	53	9.5	2.5	.12	60
18	206	30	65	25	15	10	301	44	8.7	2.3	.11	20
19	72	39	53	22	15	10	145	40	7.7	2.0	.10	10
20	32	46	44	18	15	12	3970	35	7.3	1.8	.09	7.0
21	23	118	33	15	14	11	3260	33	7.0	1.6	.09	5.1
22	20	132	31	116	14	9.5	966	29	9.5	1.4	.09	2.8
23	17	59	30	85	13	9.5	1230	27	55	1.1	.09	1.2
24	63	42	25	37	12	9.0	306	26	218	1.5	.08	.73
25	96	83	24	35	12	7.7	122	24	138	4.7	.06	.45
26	76	100	22	56	12	6.6	86	20	89	3.3	.06	.35
27	45	34	20	39	10	6.2	69	20	49	2.2	.06	.24
28	135	89	18	28	11	5.8	59	20	27	1.6	.06	.19
29	1470	60	21	23	---	5.5	52	19	18	1.1	.06	.14
30	1790	40	20	19	---	5.2	53	18	13	4.0	.07	.12
31	785	---	17	18	---	4.9	---	18	---	1.8	.04	---
TOTAL	7449.6	2282	1615	892	517	314.4	31943.2	2768	859.4	107.7	8.16	536.81
MEAN	240	76.1	52.1	28.8	18.5	10.1	1065	89.3	28.6	3.47	.26	17.9
MAX	1790	681	273	116	47	17	7730	760	218	10	1.3	377
MIN	6.2	19	17	13	10	4.9	3.2	18	7.0	1.1	.04	.03
AC-FT	14780	4530	3200	1770	1030	624	63360	5490	1700	214	16	1060
CAL YR 1976	TOTAL	34041.82	MEAN	93.0	MAX	2210	MIN	.05	AC-FT	67520		
WTR YR 1977	TOTAL	49293.27	MEAN	135	MAX	7730	MIN	.03	AC-FT	97770		



## 08207000 FRIO RIVER AT CALLIHAM, TX

LOCATION.--Lat 28°29'31", long 98°20'47", McMullen County, Hydrologic Unit 12110108, on right bank at upstream side of county bridge, 0.6 mi (1.0 km) upstream from bridge on Farm Road 99, 0.8 mi (1.3 km) north of Calliham, 10.7 mi (17.2 km) downstream from San Miguel Creek, and 20.8 mi (33.5 km) upstream from mouth.

DRAINAGE AREA.--5,491 mi<sup>2</sup> (14,222 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1924 to April 1926 (monthly discharge only), April 1932 to current year.

REVISED RECORDS.--WSP 788: Drainage area. WSP 2123: 1932.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 153.47 ft (46.778 m) above mean sea level. Prior to Apr. 30, 1926, nonrecording gage at present site and datum.

REMARKS.--Water-discharge records good. Part of flow of Frio River and its headwater tributaries enter the Edwards and associated limestones in the Balcones Fault Zone which crosses basin upstream from U.S. Highway 90 (see REMARKS for station 08205500 Frio River near Derby). Considerable loss of flow into various permeable formations also occurs downstream from the Balcones Fault Zone. Many small diversions above station for irrigation.

AVERAGE DISCHARGE.--46 years (water years 1925, 1933-77), 248 ft<sup>3</sup>/s (7.023 m<sup>3</sup>/s), 179,700 acre-ft/yr (222 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,200 ft<sup>3</sup>/s (2,270 m<sup>3</sup>/s) July 6, 1932, gage height, 39.2 ft (11.95 m), from flood-marks, from rating curve extended above 24,000 ft<sup>3</sup>/s (680 m<sup>3</sup>/s) on basis of contracted-opening measurement and flow-over-road measurement of 42,400 ft<sup>3</sup>/s (1,200 m<sup>3</sup>/s); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1870, that of July 6, 1932, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,700 ft<sup>3</sup>/s (76.5 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)	Date	Time	Discharge (ft <sup>3</sup> /s)	(m <sup>3</sup> /s)	Gage height (ft)	(m)
Oct. 30	0600	3,660	104	21.56	6.571	Apr. 17	1200	7,320	207	28.07	8.556
Apr. 15	0100	*9,830	278	30.08	9.168	Apr. 22	0200	5,310	150	25.41	7.745

Minimum discharge, 42 ft<sup>3</sup>/s (1.19 m<sup>3</sup>/s) for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	180	2340	269	209	235	234	167	698	266	186	62	46
2	175	2430	237	207	230	227	169	657	263	168	58	44
3	169	1790	214	205	251	226	168	574	253	155	57	42
4	169	1260	200	201	266	228	163	544	245	145	55	43
5	1630	991	193	199	277	224	158	532	234	138	55	44
6	1660	633	192	198	276	219	152	518	232	133	53	45
7	512	354	193	200	270	219	149	491	234	128	52	47
8	605	274	196	205	266	216	150	450	228	119	50	51
9	421	249	196	207	258	221	153	416	216	115	48	99
10	383	234	202	204	251	216	161	384	200	110	50	50
11	277	221	224	204	249	209	150	354	192	104	49	47
12	216	207	214	210	253	202	141	365	189	97	47	43
13	190	204	204	261	249	199	139	782	179	96	46	45
14	178	201	436	407	251	199	5250	1280	172	92	48	50
15	184	197	890	325	255	198	7960	710	168	86	49	50
16	359	190	853	277	261	201	5030	674	160	84	50	150
17	507	191	882	269	263	202	6820	799	157	83	50	339
18	424	206	821	265	256	194	4380	943	153	80	49	88
19	376	245	764	251	248	187	1060	974	147	79	48	67
20	374	289	674	233	246	183	1460	800	138	76	46	60
21	458	272	475	219	245	183	4450	603	135	75	46	55
22	311	371	347	245	244	178	4450	513	133	74	46	54
23	203	348	291	708	243	175	2630	459	146	73	45	52
24	199	278	269	548	242	173	2760	414	385	76	43	48
25	360	259	253	433	242	170	2000	377	477	73	44	45
26	333	641	255	362	239	165	1540	361	291	73	44	44
27	283	532	247	331	236	163	1440	361	227	71	46	42
28	452	368	232	293	238	161	1340	344	269	69	46	42
29	2420	458	223	269	---	161	1070	311	250	68	46	43
30	3570	320	224	252	---	161	830	286	215	66	46	43
31	2970	---	217	242	---	161	---	273	---	64	46	---
TOTAL	20548	16553	11087	8639	7040	6055	56490	17247	6554	3056	1520	1918
MEAN	663	552	358	279	251	195	1883	556	218	98.6	49.0	63.9
MAX	3570	2430	890	708	277	234	7960	1280	477	186	62	339
MIN	169	190	192	198	230	161	139	273	133	64	43	42
AC-FT	40760	32830	21990	17140	13960	12010	112000	34210	13000	6060	3010	3800
CAL YR 1976	TOTAL	144636	MEAN	395	MAX	3570	MIN	28	AC-FT	286900		
WTR YR 1977	TOTAL	156707	MEAN	429	MAX	7960	MIN	42	AC-FT	310800		

NUECES RIVER BASIN

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08207000 FRIO RIVER AT CALLIHAM, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: November 1967 to current year. Pesticide analyses: October 1974 to current year. Sediment records: October 1976 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1967 to current year.

WATER TEMPERATURES: November 1967 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 5,750 micromhos Nov. 30, 1968; minimum daily, 104 micromhos Feb. 13, 1969.

WATER TEMPERATURES: Maximum daily, 33.0°C July 17, 1971; minimum daily, 6.0°C Jan. 9, 1970, Jan. 12, 13, 1973.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,200 micromhos Jan. 18; minimum daily, 224 micromhos Apr. 17.

WATER TEMPERATURES: Maximum daily, 32.0°C Aug. 1, 2, 8, 9; minimum daily, 8.0°C Jan. 2, 7, 10, 11.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 31...	0920	3100	281	7.8	14.0	88	19	30	3.2	17
NOV 30...	1020	300	1310	8.3	9.0	400	230	130	19	120
DEC 07...	1300	210	1690	8.0	11.5	540	330	170	29	140
FEB 28...	1730	240	1510	7.8	16.0	460	320	140	27	130
APR 30...	1315	820	871	7.8	23.0	290	110	92	14	62
JUL 13...	1115	86	1450	7.6	29.5	490	330	150	27	110
SEP 14...	1240	45	1770	7.6	28.0	510	340	150	34	180

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 31...	.8	5.8	84	0	20	28	.2	10	156
NOV 30...	2.6	5.7	214	0	160	230	.2	15	785
DEC 07...	2.6	6.0	266	0	210	290	.2	14	990
FEB 28...	2.6	4.2	170	0	190	260	.2	11	846
APR 30...	1.6	5.0	220	0	83	110	.2	14	489
JUL 13...	2.2	4.6	190	0	180	260	.2	14	839
SEP 14...	3.5	4.4	210	0	240	320	.3	16	1050

## NUECES RIVER BASIN

08207000 FRIO RIVER AT CALLIHAM, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	TOTAL PCB (UG/L)	PCB IN BOTTOM MATERIAL (UG/KG)	POLY-CHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL CHLORDANE (UG/L)	CHLORDANE IN BOTTOM MATERIAL (UG/KG)
JAN 12...	1110	200	8.0	.0	0	.00	.00	.0	.0	0
MAR 16...	1255	210	20.0	.0	--	.00	.00	--	.0	--
MAY 11...	1120	370	25.0	.0	--	.00	.00	--	.0	--
JUL 13...	1115	86	29.5	.0	2	.00	.00	.0	.0	0

DATE	TOTAL DDD (UG/L)	DDD IN BOTTOM MATERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDT (UG/L)	DDT IN BOTTOM MATERIAL (UG/KG)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)	DI-ELDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ENDRIN (UG/L)
JAN 12...	.00	.0	.00	.4	.00	.0	.00	.00	.0	.00
MAR 16...	.00	--	.00	--	.00	--	.00	.00	--	.00
MAY 11...	.00	--	.00	--	.00	--	.00	.00	--	.00
JUL 13...	.00	.0	.00	.0	.00	.0	.00	.00	.0	.00

DATE	ENDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	HEPTACHLOR IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	HEPTACHLOR EPOXIDE IN BOTTOM MATERIAL (UG/KG)	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL MALATHION (UG/L)
JAN 12...	.0	.00	.00	.0	.00	.0	.00	.0	.00
MAR 16...	--	.00	.00	--	.00	--	.00	--	.00
MAY 11...	--	.00	.00	--	.00	--	.00	--	.00
JUL 13...	.0	.00	.00	.0	.00	.0	.00	.0	.00

DATE	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRIETHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOXAPHENE IN BOTTOM MATERIAL (UG/KG)	TOTAL TRIETHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
JAN 12...	.00	.00	.00	0	0	.00	.00	.00	.00
MAR 16...	.00	.00	.00	0	--	.00	.00	.00	.00
MAY 11...	.00	.00	.00	0	--	.00	--	--	--
JUL 13...	.00	.00	.00	0	0	.00	.00	.00	.00

NUECES RIVER BASIN

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08207000 FRIO RIVER AT CALLIHAM, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS- CHARGE (CFS)	TEMPER- ATURE (DEG C)	SUS- PENDE SEDI- MENT (MG/L)	SUS- PENDE SEDI- MENT DIS- CHARGE (T/DAY)
OCT 27...	1230	263	18.0	148	105
DEC 07...	1310	210	11.5	131	74
JAN 18...	1820	291	8.0	72	57
MAR 01...	1818	258	15.5	98	68
APR 13...	1145	138	21.0	118	44
MAY 25...	1127	399	25.5	166	179

MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG)
OCT. 1976.....	20548	609	350	19300	81	4500	56	3110	190
NOV. 1976.....	16553	843	490	21800	130	5750	86	3860	270
DEC. 1976.....	11087	1410	830	24700	250	7540	170	4980	440
JAN. 1977.....	8639	1770	1050	24500	330	7680	220	5150	550
FEB. 1977.....	7040	1690	1000	19000	310	5920	210	3950	530
MAR. 1977.....	6055	1600	940	15400	290	4790	190	3170	500
APR. 1977.....	56490	460	270	40500	53	8040	41	6300	150
MAY 1977.....	17247	951	540	25400	150	6940	93	4340	300
JUNE 1977.....	6554	1280	740	13100	220	3910	140	2530	400
JULY 1977.....	3056	1410	820	6800	250	2060	160	1360	440
AUG. 1977.....	1520	1700	1000	4120	310	1280	210	862	530
SEPT 1977.....	1918	1350	790	4100	240	1220	160	810	420
TOTAL .....	156707	**	**	219000	**	59600	**	40400	**
WTD. AVG. ....	429.33	889	520	**	140	**	95	**	280

## NUECES RIVER BASIN

08207000 FRIO RIVER AT CALLIHAM, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	987	354	1570	1650	1740	1520	1670	942	1170	1250	1580	1750
2	1130	396	1580	1700	1770	1540	1690	1110	1200	1220	1590	1770
3	1210	474	1630	1660	1800	1570	1710	1080	1190	1120	1620	1750
4	1330	657	1660	1690	1960	1590	1690	1020	1210	1180	1640	1780
5	683	725	1680	1700	1860	1580	1660	1040	1220	1250	1640	1800
6	328	811	1700	1710	1800	1590	1680	1060	1250	1300	1670	1750
7	1270	897	1690	1730	1770	1590	1660	1080	1320	1370	1670	1740
8	679	954	1710	1740	1710	1570	1600	1100	1270	1390	1680	1690
9	671	1010	1710	1750	1730	1550	1670	1130	1420	1420	1680	1450
10	978	1050	1680	1760	1720	1550	1640	1180	1300	1410	1710	1300
11	1100	1120	1690	1750	1770	1570	1720	1200	1280	1420	1700	1590
12	1080	1160	1700	1840	1840	1560	1710	1250	1340	1450	1710	1800
13	1070	1250	1580	2110	1750	1570	1660	900	1300	1470	1700	1780
14	1050	1270	1570	1810	1730	1580	336	524	1310	1470	1720	1770
15	1090	1300	1170	1850	1690	1620	239	996	1350	1520	1740	1750
16	945	1370	1360	1880	1640	1600	272	1010	1400	1490	1750	1050
17	833	1420	1170	2070	1640	1590	224	732	1390	1490	1710	650
18	753	1480	1040	2200	1620	1580	404	757	1400	1500	1700	706
19	960	1520	1120	2040	1580	1590	1050	691	1420	1500	1690	1090
20	1170	1550	1150	1950	1600	1590	1170	760	1410	1500	1690	1280
21	1110	1790	1370	1850	1590	1620	331	867	1480	1470	1720	1430
22	950	1730	1380	1950	1580	1650	345	954	1460	1530	1750	1510
23	771	1530	1600	1500	1570	1630	435	1030	1450	1560	1700	1570
24	890	1550	1590	1320	1560	1650	532	1070	1250	1570	1710	1640
25	1010	1530	1600	1460	1530	1690	661	1120	1020	1580	1740	1650
26	872	1410	1610	1820	1540	1680	683	1140	1270	1600	1750	1640
27	1010	1000	1670	1900	1540	1660	673	1140	1180	1580	1750	1650
28	1020	1090	1640	1980	1520	1680	707	1120	1280	1610	1740	1660
29	369	1140	1680	1850	---	1660	779	1140	1340	1600	1740	1650
30	300	1320	1690	1820	---	1690	871	1140	1350	1610	1750	1660
31	278	---	1690	1760	---	1710	---	1180	---	1610	1720	---
MEAN	900	1160	1540	1800	1680	1610	1050	1010	1310	1450	1700	1540

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26.0	16.0	11.0	10.0	12.0	16.0	20.0	22.0	29.0	30.0	32.0	29.0
2	26.0	18.0	11.0	8.0	11.0	16.0	22.0	24.0	29.0	29.0	32.0	29.0
3	26.0	17.0	11.0	9.0	12.0	16.0	21.0	24.0	29.0	31.0	31.0	30.0
4	26.0	16.0	12.0	10.0	10.0	15.0	---	25.0	29.0	30.0	31.0	---
5	22.0	17.0	12.0	10.0	11.0	---	20.0	24.0	28.0	30.0	31.0	29.0
6	21.0	18.0	14.0	9.0	11.0	16.0	20.0	24.0	29.0	30.0	31.0	28.0
7	20.0	18.0	11.0	8.0	12.0	15.0	20.0	24.0	29.0	30.0	---	29.0
8	18.0	17.0	12.0	10.0	12.0	---	21.0	24.0	29.0	30.0	32.0	27.0
9	19.0	---	12.0	11.0	13.0	16.0	21.0	24.0	29.0	30.0	32.0	30.0
10	20.0	17.0	14.0	8.0	14.0	17.0	21.0	24.0	29.0	---	30.0	29.0
11	21.0	20.0	11.0	8.0	14.0	17.0	22.0	24.0	29.0	30.0	31.0	---
12	19.0	16.0	12.0	---	13.0	17.0	22.0	24.0	29.0	30.0	31.0	30.0
13	22.0	15.0	11.5	11.0	14.0	16.0	21.0	25.0	29.0	30.0	31.0	30.0
14	22.0	15.0	11.0	---	13.0	19.0	24.0	24.0	29.0	30.0	---	30.0
15	21.0	13.0	14.0	10.0	14.0	20.0	20.0	24.0	29.0	30.0	30.0	29.0
16	20.0	---	13.0	9.0	15.0	---	20.0	25.0	29.0	29.0	30.0	31.0
17	21.0	11.0	13.0	10.0	13.0	20.0	20.0	25.0	29.0	---	30.0	---
18	20.0	11.0	14.0	10.0	15.0	22.0	22.0	25.0	30.0	29.0	30.0	28.0
19	---	12.0	15.0	10.0	17.0	25.0	22.0	26.0	29.0	30.0	30.0	30.0
20	18.0	12.0	11.0	9.0	18.0	20.0	22.0	25.0	28.0	30.0	31.0	29.0
21	17.0	15.0	11.0	12.0	18.0	20.0	21.0	24.0	29.0	30.0	---	29.0
22	19.0	14.0	11.0	13.0	17.0	19.0	21.0	25.0	28.0	30.0	31.0	29.0
23	19.0	14.0	12.0	14.0	18.0	18.0	21.0	26.0	26.0	30.0	31.0	29.0
24	---	14.0	12.0	12.0	17.0	18.0	23.0	25.0	27.0	---	31.0	29.0
25	18.0	15.0	---	15.0	18.0	19.0	24.0	27.0	27.0	31.0	31.0	---
26	20.0	16.0	13.0	12.0	16.0	20.0	24.0	26.0	29.0	31.0	31.0	30.0
27	---	16.0	13.0	14.0	18.0	21.0	24.0	27.0	28.0	31.0	31.0	30.0
28	15.0	10.0	14.0	13.0	16.0	21.0	23.0	27.0	29.0	31.0	---	30.0
29	15.0	10.0	12.0	12.0	---	21.0	23.0	27.0	29.0	31.0	31.0	29.0
30	16.0	9.0	12.0	11.0	---	21.0	23.0	27.0	29.0	31.0	31.0	29.0
31	14.0	---	10.0	11.0	---	20.0	---	28.0	---	31.0	30.0	---
MEAN	20.0	14.5	12.0	10.5	14.5	18.5	21.5	25.0	28.5	30.0	31.0	29.5

## 08208000 ATASCOSA RIVER AT WHITSETT, TX

LOCATION.--Lat 28°37'18", long 98°17'02", Live Oak County, Hydrologic Unit 12110110, on right bank 1,000 ft (305 m) upstream from bridge on Farm Road 99, 1.1 mi (1.8 km) southwest of Whitsett, 3.9 mi (6.3 km) downstream from La Parita Creek, and 13.1 mi upstream from mouth.

DRAINAGE AREA.--1,171 mi<sup>2</sup> (3,033 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1924 to May 1926, May 1932 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 159.04 ft (48.475 m) above mean sea level. Prior to May 8, 1926, non-recording gage at bridge 1,200 ft (366 m) downstream at datum 1.38 ft (0.421 m) higher.

REMARKS.--Water-discharge records good. Considerable loss of flow into various permeable formations occurs upstream from station. Records of the Lower Nueces River Water Supply District indicate that during the current year the Campbellton water wells discharged 42.7 acre-ft (52,600 m<sup>3</sup>) into the Atascosa River 12 mi (19 km) upstream from this station. Small diversions above station.

AVERAGE DISCHARGE.--46 years (water years 1925, 1933-77), 138 ft<sup>3</sup>/s (3.908 m<sup>3</sup>/s), 99,980 acre-ft/yr (123 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 121,000 ft<sup>3</sup>/s (3,430 m<sup>3</sup>/s) Sept. 23, 1967, gage height, 41.3 ft (12.59 m), from floodmark, from rating curve extended above 24,000 ft<sup>3</sup>/s (680 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1881, that of Sept. 23, 1967. Second highest stage, 41 ft (12.5 m), discharge 106,000 ft<sup>3</sup>/s (3,000 m<sup>3</sup>/s), occurred in September 1919.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft<sup>3</sup>/s (42.5 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge		Gage height		Date	Time	Discharge		Gage height	
		(ft³/s)	(m³/s)	(ft)	(m)			(ft³/s)	(m³/s)	(ft)	(m)
Oct. 7	0200	2,450	69.4	20.84	6.352	Apr. 15	0500	9,340	265	28.79	8.775
Oct. 17	1800	1,540	43.6	17.46	5.322	aApr. 17	1400	14,700	416	32.00	9.754
Oct. 26	0800	1,520	43.0	17.31	5.276	bApr. 21	2000	*15,600	442	32.50	9.906
Oct. 30	2300	4,600	130	24.86	7.577	May 13	1500	2,400	68.0	20.71	6.312
Nov. 27	1800	1,680	47.6	18.15	5.532						

a Estimated from graph; recorder submerged.

b From floodmark; recorder submerged.

Minimum discharge, 2.8 ft<sup>3</sup>/s (0.079 m<sup>3</sup>/s) Aug. 16-18, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	115	1760	104	36	37	21	16	90	35	23	5.3	3.8
2	46	773	73	35	36	21	16	113	35	19	5.1	3.5
3	30	215	57	33	36	21	16	129	33	17	5.5	3.9
4	26	131	46	32	44	22	15	102	30	15	4.9	3.8
5	1490	100	44	31	43	23	15	79	29	15	4.2	3.7
6	2120	83	360	31	40	23	14	70	27	15	4.1	4.0
7	1790	73	450	31	37	24	15	63	26	14	4.2	5.3
8	217	64	135	31	35	24	16	57	25	14	4.1	6.4
9	84	58	77	31	33	23	14	222	26	13	3.8	4.8
10	47	55	58	29	33	24	12	636	24	13	3.5	12
11	34	52	47	28	37	22	11	831	22	12	3.6	9.9
12	26	48	43	36	64	20	11	969	25	11	3.6	6.5
13	22	47	41	164	108	20	21	2130	24	10	3.6	5.8
14	19	47	231	379	75	20	3950	774	22	11	3.8	5.5
15	51	46	788	329	52	20	7840	189	24	10	3.2	4.9
16	945	45	566	148	41	20	5690	125	23	10	3.1	169
17	1460	49	235	89	35	20	13200	102	20	9.9	2.9	298
18	678	62	127	67	32	19	7060	88	20	9.4	3.6	75
19	215	121	109	53	30	18	2140	78	18	9.3	4.0	44
20	125	197	191	45	28	18	994	72	18	9.2	3.8	34
21	58	169	171	39	26	17	12800	70	20	8.5	3.3	26
22	40	123	98	66	25	17	10300	128	23	8.3	3.0	22
23	31	110	70	364	25	16	3060	140	64	7.7	3.1	18
24	80	78	58	486	25	17	852	161	145	7.6	3.3	15
25	994	75	57	250	25	17	261	208	174	7.0	3.3	14
26	1290	785	51	138	24	16	179	105	113	6.0	3.0	12
27	342	1550	55	93	23	16	134	69	70	5.7	3.2	11
28	373	753	48	69	22	17	116	55	47	5.8	3.2	11
29	2350	303	42	54	---	17	92	50	35	5.6	3.2	10
30	4190	186	40	45	---	17	87	45	28	5.2	3.4	9.4
31	3740	---	38	39	---	17	---	40	---	5.2	3.8	---
TOTAL	23028	8158	4510	3301	1071	607	68947	7990	1225	332.4	115.7	852.2
MEAN	743	272	145	106	38.3	19.6	2298	258	40.8	10.7	3.73	28.4
MAX	4190	1760	788	486	108	24	13200	2130	174	23	5.5	298
MIN	19	45	38	28	22	16	11	40	18	5.2	2.9	3.5
AC-FT	45680	16180	8950	6550	2120	1200	136800	15850	2430	659	229	1690
CAL YR 1976	TOTAL	55575.8	MEAN	152	MAX	4190	MIN	1.0	AC-FT	110200		
WTR YR 1977	TOTAL	120137.3	MEAN	329	MAX	13200	MIN	2.9	AC-FT	238300		



## NUECES RIVER BASIN

08208000 ATASCOSA RIVER AT WHITSETT, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Sediment records: September 1976 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	TEMPER- ATURE (DEG C)	SUS- PENDE SEDI- MENT (MG/L)	SUS- PENDE SEDI- MENT DIS- CHARGE (T/DAY)	SUS. SED. FALL DIAM. % FINER THAN .002 MM	SUS. SED. FALL DIAM. % FINER THAN .004 MM	SUS. SED. FALL DIAM. % FINER THAN .008 MM
OCT 26...	1330	1330	21.5	318	1140	77	80	82
DEC 08...	1405	107	11.0	236	68	--	--	--
JAN 17...	1445	71	8.0	103	20	--	--	--
FEB 28...	1326	20	14.0	22	1.2	--	--	--
APR 11...	1400	12	20.0	26	.84	--	--	--
APR 15...	1400	7720	21.5	188	3920	--	--	--
MAY 23...	1700	139	23.5	279	105	--	--	--
DATE		SUS. SED. FALL DIAM. % FINER THAN .016 MM	SUS. SED. FALL DIAM. % FINER THAN .031 MM	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM	SUS. SED. SIEVE DIAM. % FINER THAN .125 MM	SUS. SED. SIEVE DIAM. % FINER THAN .250 MM	SUS. SED. SIEVE DIAM. % FINER THAN .500 MM	SUS. SED. SIEVE DIAM. % FINER THAN 1.00 MM
OCT 26...		85	87	87	90	92	97	100
DEC 08...		--	--	--	--	--	--	--
JAN 17...		--	--	--	--	--	--	--
FEB 28...		--	--	--	--	--	--	--
APR 11...		--	--	--	--	--	--	--
APR 15...		--	--	--	--	--	--	--
MAY 23...		--	--	--	--	--	--	--

08210000 NUECES RIVER NEAR THREE RIVERS, TX  
(National stream-gaging accounting network)

LOCATION.--Lat 28°26'10", long 98°11'06", Live Oak County, Hydrologic Unit 12110111, on left bank 100 ft (30 m) downstream from Missouri Pacific Railroad bridge, 0.2 mi (0.3 km) downstream from Frio River, 1.7 mi (2.7 km) south of Three Rivers, and at mile 102.6 (165.1 km).

DRAINAGE AREA.--15,600 mi<sup>2</sup> (40,400 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1915 to current year. Monthly discharge only for November 1919 to January 1920, published in WSP 1312.

REVISED RECORDS.--WSP 548: 1920-21. WSP 1562: 1916, 1918-21, 1922(M), 1923, 1929.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 101.13 ft (30.824 m) above mean sea level. Prior to Apr. 5, 1932, nonrecording gage at railroad bridge 100 ft (30 m) upstream at same datum.

REMARKS.--Water-discharge records good. Part of flow of Nueces and Frio Rivers and their headwater tributaries enter the Edwards and associated limestones in the Balcones Fault Zone upstream from U.S. Highway 90 (see REMARKS for stations 08194600 and 08205500). Considerable loss of flow into various permeable formations occurs downstream from the Balcones Fault Zone. Many small diversions for irrigation and municipal supply above station. Minor upstream regulation by small reservoirs and by ground-water supplements (see station 08208000 Atascosa River at Whitsett). National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--62 years, 869 ft<sup>3</sup>/s (24.61 m<sup>3</sup>/s), 629,600 acre-ft/yr (776 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 141,000 ft<sup>3</sup>/s (3,990 m<sup>3</sup>/s) Sept. 23, 1967, gage height, 49.21 ft (14.999 m); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1875, that of Sept. 23, 1967.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 6,000 ft<sup>3</sup>/s (170 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
Oct. 6	0700	6,690 189	26.10 7.955	Apr. 18	1800	*19,900 564	37.10 11.308
Nov. 4	0300	18,800 532	36.63 11.165	Apr. 23	1000	16,900 479	35.64 10.863

Minimum discharge, 46 ft<sup>3</sup>/s (1.30 m<sup>3</sup>/s) Sept. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1530	12100	1410	689	621	477	358	2010	1700	370	102	49
2	1260	13200	1300	653	592	460	360	1940	1780	352	96	49
3	1380	17600	1130	620	584	458	361	1900	1620	336	90	47
4	1580	18400	937	594	632	460	354	1810	1130	314	86	47
5	4620	16100	793	582	674	458	340	1600	967	297	84	47
6	6450	11600	784	572	691	449	324	1360	808	284	82	48
7	4720	7440	1200	562	685	443	308	1250	710	265	78	48
8	3010	5080	910	560	661	443	299	1180	653	244	76	61
9	1990	3880	717	558	628	442	294	1130	601	229	73	107
10	1940	3370	636	548	597	443	299	1510	546	213	70	71
11	2010	3150	616	542	586	435	300	1700	499	200	71	59
12	2170	3060	606	547	662	424	283	1950	475	185	68	55
13	2370	2970	578	649	668	420	276	2470	466	168	66	55
14	2290	2810	816	1090	654	414	2010	3140	453	163	63	72
15	1300	2550	2230	1330	605	413	7060	1980	535	156	63	64
16	2250	1810	2810	1170	574	410	13200	1320	722	148	62	61
17	3190	901	2520	1020	560	406	16100	1350	420	143	61	566
18	2490	893	2440	817	560	395	19100	1460	378	144	59	365
19	1620	1190	2500	796	545	386	16900	1620	380	142	58	136
20	1340	1620	3590	699	537	383	8750	1660	364	138	56	106
21	1000	1740	3520	619	525	383	5790	1530	339	138	54	91
22	807	1760	3480	603	508	373	11300	1690	325	127	53	81
23	594	1790	3470	1270	501	364	16400	1490	425	120	50	76
24	533	1610	3270	1740	496	362	12000	1210	670	119	49	70
25	1100	1330	3010	1560	494	358	6770	1360	1050	117	48	63
26	1850	1660	2930	1430	488	354	3350	1380	811	112	48	59
27	1540	2580	2750	1360	481	360	2560	1420	578	108	48	56
28	1490	2570	2210	1170	480	361	2490	1460	442	104	50	52
29	5410	1970	1090	948	---	356	2320	1490	434	102	49	52
30	9610	1600	823	768	---	360	2190	1540	395	102	49	52
31	11600	---	750	669	---	365	---	1600	---	102	49	---
TOTAL	85044	148334	55826	26735	16289	12615	152446	50510	20676	5742	2011	2765
MEAN	2743	4944	1801	862	582	407	5082	1629	689	185	64.9	92.2
MAX	11600	18400	3590	1740	691	477	19100	3140	1780	370	102	566
MIN	533	893	578	542	480	354	276	1130	325	102	48	47
AC-FT	168700	294200	110700	53030	32310	25020	302400	100200	41010	11390	3990	5480
CAL YR 1976	TOTAL	523945	MEAN	1432	MAX	18400	MIN 34	AC-FT	1039000			
WTR YR 1977	TOTAL	578993	MEAN	1586	MAX	19100	MIN 47	AC-FT	1148000			

## NUECES RIVER BASIN

08210000 NUECES RIVER NEAR THREE RIVERS, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1941 to September 1947, September 1950 to September 1952. Chemical, biochemical, and pesticide analyses: January 1968 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: September 1945 to September 1947, September 1950 to September 1952, October 1974 to current year.

WATER TEMPERATURES: October 1975 to current year.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (1974-77): Maximum daily, 4,310 micromhos Jan. 17, 1977; minimum daily, 157 micromhos May 26, 1975.

WATER TEMPERATURES (1975-77): Maximum daily, 32.0°C July 31, Aug. 8, 22, 1977; minimum daily, 8.0°C Jan. 2, 1977.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,310 micromhos Jan. 17; minimum daily, 190 micromhos Apr. 23.

WATER TEMPERATURES: Maximum daily, 32.0°C July 31, Aug. 8, 22; minimum daily, 8.0°C Jan. 2.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)
OCT 20...	1020	1370	733	7.6	17.5	55	220	8.4	90	2.8
NOV 17...	1325	853	999	7.7	11.5	35	75	9.2	87	1.1
DEC 15...	1115	2270	1270	7.9	12.0	48	140	9.8	94	2.2
JAN 12...	1200	544	2440	7.9	9.0	0	20	10.7	96	.9
FEB 16...	1000	575	2250	7.7	13.0	0	15	9.7	95	1.8
MAR 16...	1100	392	1630	7.8	20.0	0	20	8.6	98	1.0
APR 13...	1030	231	1580	7.9	22.5	0	15	8.1	95	1.6
MAY 11...	1015	1640	878	7.5	24.5	25	130	7.2	88	2.7
JUN 08...	0945	656	1110	7.7	27.5	20	35	7.3	94	2.0
JUL 13...	0940	172	1190	7.7	29.0	5	7	6.8	89	1.3
AUG 17...	1030	61	1740	7.4	28.5	15	15	6.6	86	1.3
SEP 14...	1040	62	1480	7.7	27.0	30	30	6.5	82	1.5
DATE	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. PER 100 ML)	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)
OCT 20...	11000	9300	6500	190	81	64	7.3	69	2.2	6.8
NOV 17...	11000	360	720	290	130	97	12	92	2.3	6.1
DEC 15...	25000	5200	21000	330	190	110	13	140	3.4	6.5
JAN 12...	240	64	380	600	410	200	24	270	4.8	4.7
FEB 16...	230	120	60	--	--	--	--	--	--	--
MAR 16...	3000	180	360	460	290	140	27	150	3.0	4.0
APR 13...	240	60	220	460	290	140	27	150	3.0	4.3
MAY 11...	33000	2000	3500	--	--	--	--	--	--	--
JUN 08...	12000	220	1000	350	170	110	18	100	2.3	5.4
JUL 13...	470	200	290	330	170	100	20	110	2.6	4.9
AUG 17...	1100	470	1400	--	--	--	--	--	--	--
SEP 14...	24000	900	2300	360	190	110	21	160	3.7	5.8

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08210000 NUECES RIVER NEAR THREE RIVERS, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	RICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)
OCT 20...	133	0	47	130	.1	13	414	403	492	76
NOV 17...	200	0	75	170	.2	13	613	564	147	23
DEC 15...	168	0	110	260	.1	13	775	735	396	48
JAN 12...	234	0	150	600	.2	11	1520	1380	42	11
FEB 16...	--	--	--	--	--	--	--	--	32	8
MAR 16...	212	0	160	340	.1	11	1030	937	40	8
APR 13...	214	0	150	340	.1	12	1020	929	40	10
MAY 11...	--	--	--	--	--	--	--	--	308	28
JUN 08...	220	0	97	190	.2	16	700	645	80	14
JUL 13...	200	0	120	200	.2	15	720	669	19	2
AUG 17...	--	--	--	--	--	--	--	--	33	0
SEP 14...	210	0	160	270	.2	18	912	849	86	9

DATE	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUS- PENDE SEDIM- ENT (MG/L)	SUS- PENDE SEDIM- ENT (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT 20...	.39	.01	.03	.97	.20	9.1	508	1880	100
NOV 17...	1.1	.01	.03	--	.14	6.6	137	316	98
DEC 15...	1.8	.01	.06	1.3	.17	13	370	2270	89
JAN 12...	3.0	.00	.04	.67	.05	5.6	83	122	87
FEB 16...	3.3	.00	.03	.59	.05	2.2	54	84	96
MAR 16...	3.4	.01	.06	.62	.06	7.2	59	62	86
APR 13...	2.8	.01	.03	.48	.05	5.2	49	31	95
MAY 11...	1.3	.01	.09	.79	.18	9.9	343	1520	90
JUN 08...	1.7	.00	.01	1.3	.12	7.3	144	256	58
JUL 13...	1.4	.01	.04	.53	.04	3.3	20	9.3	99
AUG 17...	1.5	.02	.05	1.1	.11	5.1	39	6.4	85
SEP 14...	1.4	.01	.11	.58	.15	5.1	73	12	96

## NUECES RIVER BASIN

08210000 NUECES RIVER NEAR THREE RIVERS, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		TOTAL ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	TOTAL CADMIUM (CD) (UG/L)	DIS-SOLVED CADMIUM (CD) (UG/L)	TOTAL CHROMIUM (CR) (UG/L)	DIS-SOLVED CHROMIUM (CR) (UG/L)
DATE	TIME							
MAR 16...	1100	1	1	300	0	0	10	0
APR 13...	1030	3	2	200	0	0	10	0
JUL 13...	0940	3	3	200	<10	0	0	0

DATE	TOTAL COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MANGANESE (MN) (UG/L)
MAR 16...	0	0	2	0	1000	0	5	0	40
APR 13...	0	0	0	0	600	10	4	0	30
JUL 13...	<50	0	10	3	350	10	100	0	30

DATE	DIS-SOLVED MANGANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELENIUM (SE) (UG/L)	DIS-SOLVED SELENIUM (SE) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)
MAR 16...	10	.0	.0	1	1	0	10	0
APR 13...	20	.0	.0	0	0	0	10	0
JUL 13...	20	.3	.5	0	0	0	20	2

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MATERIAL (UG/KG)	POLY-CHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL CHLORDANE (UG/L)	CHLORDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MATERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MATERIAL (UG/KG)
NOV 17...	1325	--	--	--	ND	ND	ND	ND	ND	ND	ND	ND
FEB 16...	1000	--	--	--	ND	--	ND	--	ND	--	ND	--
MAR 16...	1100	.0	0	.00	.00	.0	.0	3	.00	.0	.00	.4
APR 13...	1030	.0	220	.00	.00	.0	.0	54	.00	.0	.00	.0
MAY 11...	1015	--	--	--	ND	--	ND	--	ND	--	ND	--
JUL 13...	0940	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0
AUG 17...	1030	--	--	--	ND	--	ND	--	ND	--	ND	--

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MATERIAL (UG/KG)	TOTAL DI-AZINON (UG/L)	DI-AZINON IN BOTTOM MATERIAL (UG/KG)	TOTAL DIELDRIN (UG/L)	DI-ELDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ETHION (UG/L)	ETHION IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR (UG/L)	HEPTACHLOR IN BOTTOM MATERIAL (UG/KG)
NOV 17...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 16...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
MAR 16...	.00	.0	.00	--	.00	.0	.00	.0	.00	--	.00	.0
APR 13...	.00	.0	.00	--	.00	.4	.00	.0	.00	--	.00	.0
MAY 11...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
JUL 13...	.00	.0	.00	--	.00	.0	.00	.0	.00	--	.00	.0
AUG 17...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--

NUECES RIVER BASIN

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08210000 NUECES RIVER NEAR THREE RIVERS, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	MALA- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL METH- OXY- CHLOR (UG/L)	METHOX- YCHLOR IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL METHYL PARA- THION (UG/L)	METHYL PARA- THION IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL METHYL TRI- THION (UG/L)	METHYL TRI- THION IN BOT- TOM MA- TERIAL (UG/KG)
NOV 17...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 16...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
MAR 16...	.00	.0	.00	.0	.01	--	--	--	.00	--	.00	--
APR 13...	.00	.0	.00	.0	.00	--	--	--	.00	--	.00	--
MAY 11...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
JUL 13...	.00	.0	.00	.0	.00	--	--	--	.00	--	.00	--
AUG 17...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--

DATE	TOTAL PARA- THION (UG/L)	PARA- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TRI- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ATRA- ZINE (UG/L)	SIMA- ZINE TOTAL COUL- SON COND. (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 17...	ND	ND	ND	ND	ND	ND	--	--	ND	ND	ND
FEB 16...	ND	--	ND	--	ND	--	ND	ND	ND	ND	ND
MAR 16...	.00	--	0	0	.00	--	--	--	.00	.00	.00
APR 13...	.00	--	0	0	.00	--	--	--	.00	.00	.00
MAY 11...	ND	--	ND	--	ND	--	ND	ND	ND	ND	ND
JUL 13...	.00	--	0	0	.00	--	--	--	.00	.00	.00
AUG 17...	ND	--	ND	--	ND	--	ND	ND	ND	ND	ND



## 08210000 NUECES RIVER NEAR THREE RIVERS, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 20,76 1020	NOV 17,76 1325	DEC 15,76 1115	JAN 12,77 1200	FEB 16,77 1000					
TOTAL CELLS/ML	880	250	560	2700	25000					
DIVERSITY: DIVISION	1.3	0.7	0.2	0.2	1.0					
..CLASS	1.3	0.7	0.2	0.2	1.0					
...ORDER	1.3	0.7	0.2	0.4	1.3					
...FAMILY	1.8	0.8	1.9	0.4	1.4					
....GENUS	1.8	0.8	1.9	0.4	1.4					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
...CHARACIACEAE	--	-	--	-	--	-	--	-	--	-
...SCHROEDERIA	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE	--	-	--	-	--	-	--	-	--	-
....ANKISTRODESMUS	150#	17	--	-	--	-	--	-	190	1
....DICTYOSPHAERIUM	--	-	--	-	--	-	--	-	14000#	58
...SCENEDESMACEAE	--	-	--	-	--	-	--	-	--	-
....SCENEDESMUS	--	-	11	4	--	-	--	-	380	2
....TETRASTRUM	--	-	--	-	--	-	*	0	--	-
..VOLVOCALES	--	-	--	-	--	-	--	-	--	-
...CHLAMYDOMONADACEAE	--	-	--	-	--	-	--	-	--	-
....CHLAMYDOMONAS	--	-	--	-	--	-	*	0	380	2
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
..PENNALES										
...NAVICULACEAE	--	-	--	-	--	-	--	-	--	-
...ENTOMONEIS	--	-	--	-	--	-	--	-	--	-
..CENTRALES										
...COSCINODISCACEAE	--	-	5	2	--	-	--	-	8300#	34
...CYCLOTELLA	--	-	--	-	--	-	2500#	94	--	-
...MELOSIRA	--	-	--	-	--	-	--	-	--	-
...STEPHANODISCUS	--	-	--	-	--	-	--	-	--	-
..PENNALES										
...ACHNANTHACEAE	--	-	--	-	--	-	--	-	--	-
...COCONEIS	--	-	--	-	--	-	--	-	--	-
...RHOICOSPHEINIA	--	-	--	-	13	2	--	-	--	-
...CYMBELLACEAE	--	-	--	-	13	2	--	-	--	-
...CYMBELLA	--	-	--	-	13	2	--	-	--	-
...DIATOMACEAE	--	-	--	-	--	-	--	-	--	-
...DIATOMA	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE	--	-	--	-	--	-	--	-	--	-
...SYNEDRA	--	-	5	2	40	7	54	2	--	-
...GOMPHONEMATACEAE	--	-	--	-	53	10	--	-	--	-
...GOMPHONEMA	--	-	--	-	53	10	--	-	--	-
...NAVICULACEAE	--	-	--	-	53	10	--	-	--	-
...GYROSIGMA	--	-	--	-	--	-	--	-	--	-
...NAVICULA	150#	17	--	-	110#	19	--	-	--	-
...NITZSCHACEAE	440#	50	11	4	320#	57	27	1	960	4
...NITZSCHIA	440#	50	11	4	320#	57	27	1	960	4
...SURIPELLACEAE	--	-	--	-	--	-	*	0	--	-
...SURIPELLA	--	-	--	-	--	-	*	0	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
..CHROCOCCALES										
...CHROCOCCACEAE	--	-	--	-	--	-	--	-	--	-
...AGMENELLUM	--	-	--	-	--	-	--	-	--	-
...HORMOGONALES	--	-	--	-	--	-	--	-	--	-
...NOSTOCACEAE	--	-	--	-	--	-	--	-	--	-
...ANABAENA	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIA	--	-	220#	87	--	-	--	-	--	-
...PHORMIDIUM	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
..CRYPTOMONIDALES										
...CRYPTOCHRYSIDACEAE	--	-	--	-	--	-	--	-	*	0
...CHROOMONAS	--	-	--	-	--	-	--	-	--	-
...CRYPTOMONODACEAE	--	-	--	-	--	-	--	-	--	-
...CRYPTOMONAS	--	-	--	-	--	-	81	3	--	-
..EUGLENOPHYCEAE										
..EUGLENALES										
...EUGLENACEAE	--	-	--	-	--	-	--	-	--	-
....EUGLENA	150#	17	--	-	13	2	--	-	--	-
...LEPOCINCLIS	--	-	--	-	--	-	--	-	--	-
...PHACUS	--	-	--	-	--	-	--	-	--	-
...TRACHELONAS	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
..PERIDINIALES										
...GLENODINIACEAE	--	-	--	-	--	-	--	-	--	-
....GLENODINIUM	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

08210000 NUECES RIVER NEAR THREE RIVERS, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	MAY 11.77 1015	JUN 8.77 0945	JUL 13.77 0940	AUG 17.77 1030	SEP 14.77 1040	
TOTAL CELLS/ML	1200	420	1100	290	190	
DIVERSITY: DIVISION	1.1	1.3	0.6	1.2	0.3	
..CLASS	1.1	1.4	0.6	1.2	0.3	
...ORDER	1.5	1.6	1.3	1.2	1.1	
...FAMILY	1.6	1.6	1.7	1.5	2.5	
....GENUS	1.6	1.6	1.7	1.5	2.5	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)						
..CHLOROPHYCEAE						
...CHLOROCOCCALES						
...CHARACIACEAE						
...SCHROEDERIA	--	-	--	-	18	6
...OOCYSTACEAE						
...ANKYSTRODESMUS	260#	21	--	-	--	-
...DICTYOSPHAERIUM	--	-	--	-	--	-
...SCENEDESMACEAE						
...SCENEDESMUS	--	-	--	-	24	2
...TFTRASTRUM	--	-	--	-	--	-
...VOLVOCALES						
...CHLAMYDOMONADACEAE						
...CHLAMYDOMONAS	33	3	--	-	--	-
CHRYCOPHYTA						
..BACILLARIOPHYCEAE						
...PENNALES						
...NAVICULACEAE						
...ENTOMONEIS	33	3	--	-	--	-
..CENTRALES						
...COSCINODISCEAE						
...CYCLOTELLA	65	5	11	3	24	2
...MELOSIRA	--	-	--	-	--	-
...STEPHANODISCUS	--	-	--	-	6	1
...PENNALES						
...ACHNANTHACEAE						
...COCCONEIS	--	-	--	-	--	-
...RHOICOSPHEINIA	--	-	--	-	6	2
...CYMBELLACEAE						
...CYMBELLA	*	0	--	-	--	-
...DIATOMACEAE						
...DIATOMA	--	-	--	-	--	-
...FRAGILARIACEAE						
...SYNEDRA	--	-	--	-	--	-
...GOMPHONEMACEAE					29	10
...GOMPHONEMA	--	-	--	-	--	-
...NAVICULACEAE						
...GYROSIGMA	--	-	--	-	--	-
...NAVICULA	--	-	--	-	24	2
...NITZSCHIA	780#	63	130#	32	--	-
...SURTRELLACEAE					6	2
...SURTRELLA	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)						
..CYANOPHYCEAE						
...CHROCOCCALES						
...CHROCOCCACEAE						
...AGMENELLUM	--	-	--	-	190#	18
...HORMOGONALES					210#	71
...NOSTOCACEAE						
...ANABAENA	*	0	--	-	100	9
...OSCILLATORIACEAE					--	-
...OSCILLATORIA	--	-	230#	55	--	-
...PHORMIDIUM	--	-	--	-	680#	64
EUGLENOPHYTA (EUGLENOIDS)						
..CRYPTOPHYCEAE						
...CRYPTOMONIDALES						
...CRYPTOCHRYSIDACEAE						
...CHROOMONAS	--	-	--	-	--	-
...CRYPTOMONODACEAE						
...CRYPTOMONAS	--	-	33	8	--	-
..EUGLENOPHYCEAE						
...EUGLENALES						
...EUGLENACEAE						
...EUGLENA	65	5	11	3	--	-
...LEPOCINCLIS	--	-	--	-	--	-
...PHACUS	--	-	--	-	6	2
...TRACHELOMONAS	--	-	--	-	6	1
PYRRHOPHYTA (FIRE ALGAE)						
..DINOPHYCEAE						
...PERIDINIALES						
...GLENODINIACEAE						
...GLENODINIUM	--	-	--	-	6	1

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## NUECES RIVER BASIN

08210000 NUECES RIVER NEAR THREE RIVERS, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA,MG) (MG/L)
OCT. 1976.....	85044	453	260	60000	47	10700	36	8240	150
NOV. 1976.....	148334	551	320	128000	70	27900	44	17500	170
DEC. 1976.....	55826	1490	860	129000	300	45100	130	20300	390
JAN. 1977.....	26735	2570	1490	108000	570	41100	230	16900	570
FEB. 1977.....	16289	2440	1410	62000	530	23500	220	9750	550
MAR. 1977.....	12615	1720	990	33800	360	12100	160	5290	450
APR. 1977.....	152446	405	240	97000	42	17400	32	13100	130
MAY 1977.....	50510	867	500	68400	150	19800	77	10500	250
JUNE 1977.....	20676	1060	610	34200	190	10700	95	5310	290
JULY 1977.....	5742	1240	720	11100	240	3680	110	1740	330
AUG. 1977.....	2011	1690	980	5300	350	1890	150	833	440
SEPT 1977.....	2765	1160	670	5010	220	1620	100	779	310
TOTAL .....	578993	**	**	742000	**	215000	**	110000	**
WTD.AVG. ....	1586.28	820	480	**	140	**	70	**	240

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	487	286	1740	2160	2410	1890	1690	760	779	1280	1560	1820
2	526	355	2100	2150	2340	1860	1700	765	813	1230	1590	1830
3	558	358	2160	2140	2260	1830	1690	800	865	1180	1630	1830
4	551	343	2180	2140	2290	1790	1720	840	865	1120	1610	1830
5	408	378	2000	2130	2480	1760	1710	856	859	1070	1620	1830
6	396	423	1820	2110	3270	1740	1670	868	1060	1090	1620	1810
7	345	478	1320	2160	3480	1730	1660	870	1220	1100	1640	1830
8	578	491	1450	2250	3750	1740	1670	865	1120	1110	1630	1800
9	508	485	1620	2340	3260	1730	1650	868	1090	1140	1640	1760
10	562	470	1680	2390	2870	1720	1620	925	1400	1160	1650	1800
11	564	466	1710	2410	2570	1690	1600	885	1150	1180	1670	1720
12	595	480	1850	2440	2410	1670	1640	807	1180	1200	1680	1680
13	598	520	1980	2360	2490	1690	1600	820	1170	1220	1700	1760
14	662	558	1740	2230	2270	1700	970	836	1180	1240	1710	1510
15	721	929	1450	2260	2300	1700	272	845	1130	1260	1710	1260
16	525	1090	1220	3500	2350	1630	269	854	953	1260	1720	1840
17	433	1010	1400	4310	2340	1650	312	836	1010	1300	1730	650
18	431	1220	1770	3620	2270	1620	271	706	1130	1310	1760	544
19	798	1150	1650	3450	2180	1800	269	694	1200	1330	1770	600
20	717	1560	1260	3210	2070	1790	450	1040	1220	1320	1760	676
21	869	1670	1280	2850	2000	1710	614	872	1230	1350	1750	903
22	983	1670	1150	2650	1910	1690	201	1050	1830	1380	1740	1050
23	950	1690	1190	2000	1900	1670	190	823	1550	1370	1750	1130
24	935	1640	1230	1630	1910	1660	347	829	1170	1390	1770	1210
25	664	1500	1280	1580	1880	1650	864	763	1250	1410	1780	1410
26	435	1210	1320	2900	1890	1670	800	1080	974	1430	1790	1430
27	489	782	1430	3010	1900	1650	729	1070	1110	1450	1780	1560
28	550	795	1690	3070	1910	1690	710	1070	1370	1470	1770	1640
29	330	1170	1890	3040	---	1710	764	963	1300	1490	1780	1640
30	258	1410	2050	2690	---	1690	753	947	1300	1490	1830	1660
31	284	---	2140	2610	---	1710	---	839	---	1540	1820	---
MEAN	571	886	1640	2570	2390	1720	1010	872	1150	1290	1710	1470

NUECES RIVER BASIN

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08210000 NUECES RIVER NEAR THREE RIVERS, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23.0	13.5	9.5	---	11.0	---	19.5	23.5	28.0	29.5	31.0	29.0
2	24.0	14.0	10.5	8.0	---	---	20.0	24.0	28.0	---	31.0	29.5
3	24.5	15.5	8.5	8.5	12.0	---	21.0	25.0	28.0	---	31.0	30.0
4	24.0	16.0	9.5	9.0	13.0	---	21.5	25.0	28.0	---	30.5	30.0
5	23.0	17.0	---	10.0	11.5	---	20.5	24.5	28.0	31.0	31.0	30.0
6	21.5	18.0	13.0	9.0	13.0	---	20.5	24.5	28.0	31.5	30.5	28.5
7	21.5	18.5	13.0	9.0	13.0	17.0	20.5	24.5	28.5	30.0	31.5	28.5
8	19.5	18.0	12.0	---	13.0	17.0	20.5	25.0	29.0	30.0	32.0	28.5
9	19.5	18.0	10.5	11.0	13.0	16.5	20.0	25.5	29.0	29.0	30.0	28.5
10	19.5	18.5	12.0	9.5	13.5	17.0	21.5	24.5	28.5	31.0	30.5	29.0
11	18.0	19.5	13.0	---	15.5	18.5	22.0	25.0	28.5	30.0	30.0	30.0
12	19.5	19.0	11.5	---	14.5	16.5	22.0	24.0	28.5	30.0	30.5	30.0
13	20.0	18.0	11.5	---	15.0	19.5	23.0	24.0	29.5	30.5	30.5	30.0
14	20.5	13.0	12.0	10.0	15.5	20.5	21.5	24.0	29.5	30.0	30.5	28.5
15	21.0	13.0	11.0	9.5	14.5	20.0	20.0	24.5	29.0	30.0	30.5	29.0
16	21.0	11.5	11.5	10.0	15.0	21.0	20.0	25.0	29.0	30.0	30.5	29.0
17	19.5	11.5	11.5	9.5	15.5	22.0	19.5	24.5	28.5	29.5	30.5	29.0
18	19.0	11.5	13.0	9.5	16.5	22.0	20.0	25.0	29.0	---	30.0	29.0
19	19.5	11.5	---	10.0	---	21.0	21.5	25.5	30.5	---	30.5	29.0
20	18.0	13.0	13.0	9.5	16.5	20.0	23.0	25.5	29.5	---	30.5	29.5
21	16.5	13.0	12.0	10.5	17.0	21.0	23.0	25.0	29.5	---	31.0	30.5
22	17.0	13.0	11.5	---	18.0	20.0	23.0	24.5	29.0	---	32.0	29.0
23	18.0	13.5	11.0	11.0	---	18.0	23.0	24.5	---	---	31.0	29.0
24	18.0	13.5	11.5	12.0	19.0	19.0	23.0	25.0	27.0	---	31.0	29.0
25	18.5	---	---	11.5	18.5	19.5	23.0	25.5	28.0	30.0	31.0	28.5
26	18.0	16.5	13.0	12.0	---	20.5	23.5	26.0	29.0	30.5	31.0	29.0
27	18.5	14.0	13.0	13.0	---	20.5	23.0	25.5	28.5	30.0	31.5	30.0
28	---	---	13.0	13.5	19.0	19.5	23.0	26.0	29.0	30.5	31.0	30.0
29	12.0	10.5	11.5	13.0	---	22.5	23.5	24.0	29.0	30.5	30.0	30.0
30	12.0	10.0	11.5	11.5	---	21.5	23.0	27.0	29.5	30.5	29.5	30.0
31	13.0	---	12.0	10.0	---	20.0	---	28.0	---	32.0	29.5	---
MEAN	19.5	14.5	11.5	10.5	15.0	19.5	21.5	25.0	28.5	30.5	30.5	29.5

## NUECES RIVER BASIN

08210400 LAGARTO CREEK NEAR GEORGE WEST, TX

LOCATION.--Lat 28°03'34", long 98°05'48", Live Oak County, Hydrologic Unit 12110111, near right bank 75 ft (23 m) downstream from bridge on U.S. Highway 281, 0.6 mi (1.0 km) upstream from Dix Hollow, and 19.3 mi (31.1 km) south of George West.

DRAINAGE AREA.--155 mi<sup>2</sup> (401 km<sup>2</sup>).

PERIOD OF RECORD.--April 1972 to current year.

GAGE.--Water-stage recorder. Datum of gage is 197.77 ft (60.280 m) above mean sea level.

REMARKS.--Records good. No known regulation or diversion.

AVERAGE DISCHARGE.--5 years, 0.39 ft<sup>3</sup>/s (0.011 m<sup>3</sup>/s), 283 acre-ft/yr (349,000 m<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,900 ft<sup>3</sup>/s (53.8 m<sup>3</sup>/s) May 13, 1972, gage height, 12.20 ft (3.719 m); no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1887, 25.1 ft (7.65 m), discharge 33,500 ft<sup>3</sup>/s (949 m<sup>3</sup>/s) Oct. 17, 1971. Second highest stage, 24.3 ft (7.41 m), discharge 29,500 ft<sup>3</sup>/s (835 m<sup>3</sup>/s) occurred Sept. 12, 1971. The third and fourth highest floods occurred in 1914 and September 1967 (stages unknown).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 25 ft<sup>3</sup>/s (0.71 m<sup>3</sup>/s) Dec. 21, gage height, 5.57 ft (1.698 m), no peak above base of 50 ft<sup>3</sup>/s (1.42 m<sup>3</sup>/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.06	.03	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.05	.16	.14	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.01	.15	.10	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.22	.05	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.08	.02	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.02	.01	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	3.4	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.81	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	12	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	2.7	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.67	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.20	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	.00	.00	19.88	.71	.35	.00	.00	.00	.00	.00	.00	.00
MEAN	.000	.000	.64	.023	.013	.000	.000	.000	.000	.000	.000	.000
MAX	.00	.00	.12	.22	.14	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	39	1.4	.7	.00	.00	.00	.00	.00	.00	.00

CAL YR 1976 TOTAL 229.96 MEAN .63 MAX 114 MIN .00 AC-FT 456  
WTR YR 1977 TOTAL 20.94 MEAN .057 MAX 12 MIN .00 AC-FT 42

## 08210500 LAKE CORPUS CHRISTI NEAR MATHIS, TX

LOCATION.--Lat 28°02'17", long 97°52'15", San Patricio-Jim Wells County line, Hydrologic Unit 12110111, on right upstream corner of outlet tower at right end of Wesley E. Seale Dam on Nueces River, 0.6 mi (1.0 km) upstream from bridge on State Highway 359, and 4.5 mi (7.2 km) southwest of Mathis.

DRAINAGE AREA.--16,656 mi<sup>2</sup> (43,139 km<sup>2</sup>).

PERIOD OF RECORD.--September 1948 to current year. Prior to October 1960, monthend records only. The Soil Conservation Service, U.S. Department of Agriculture, in cooperation with the Texas Board of Water Engineers (now Texas Department of Water Resources), collected fragmentary gage-height records in connection with sedimentation studies from Feb. 2, 1942, to July 10, 1947.

REVISED RECORDS.--WSP 1923: 1953(M), 1957(M).

GAGE.--Water-stage recorder. Datum of gage is at mean sea level. Prior to Oct. 1, 1957, nonrecording gage at various sites 0.2 mi (0.3 km) upstream at datum 0.52 ft (0.158 m) higher. Oct. 1, 1957, to Apr. 3, 1961, nonrecording gage near left end of Mathis Dam 0.2 mi (0.3 km) upstream at present datum.

REMARKS.--Mathis Dam was completed and storage began July 24, 1934. The original capacity at spillway crest (elevation, 74.5 ft or 22.71 m) was 54,000 acre-ft (66.6 hm<sup>3</sup>), but by March 1948 had decreased because of sedimentation to 39,400 acre-ft (48.6 hm<sup>3</sup>). Wesley E. Seale Dam was completed and deliberate impoundment began on Apr. 26, 1958, submerging the old Mathis Dam. Wesley E. Seale Dam is a rolled earthfill dam 5,930 ft (1,807 m) long, including two spillways. The 1,320-foot (402-meter) north spillway has 33 gates that are operated by movable hydraulic lifts. The 1,080-foot (329 m) south spillway has 27 gates that are electrically operated from the control tower. The gates were repaired and modified in August 1966. All gates in both spillways are 37.5 by 8.75 ft (11.4 by 2.67 m) wide. Water for municipal supply for the city of Corpus Christi is released downstream through a 4.0-foot-diameter (1.2 m) cylinder valve and three 2.5- by 4.0-foot (0.8- by 1.2-meter) rectangular openings. The releases are diverted from the river at Calallen 35 mi (56 km) downstream, for domestic, municipal, irrigation, mining, and industrial uses in the Corpus Christi area. The city of Alice withdrew 1,640 acre-ft (2.02 hm<sup>3</sup>) of water from the lake during the current year for municipal use. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	106.0	-
Top of north spillway gates.....	94.3	278,200
Top of south spillway gates.....	93.8	268,500
Crest of spillways.....	88.0	170,200
Lowest gated outlet (invert).....	55.5	646

COOPERATION.--The capacity curve is from an October 1972 survey. Elevation record furnished by city of Corpus Christi and reviewed by the Geological Survey.

EXTREMES (at 2400) OUTSIDE PERIOD OF RECORD.--Maximum contents, 320,000 acre-ft (395 hm<sup>3</sup>) Sept. 22, 1967, and Sept. 12, 1971; maximum elevation, 94.82 ft (28.901 m) Sept. 22, 1967; minimum contents, 14,740 acre-ft (18.2 hm<sup>3</sup>) May 5, 1951, elevation, 67.62 ft (20.611 m).

EXTREMES (at 2400) FOR CURRENT YEAR.--Maximum contents, 276,200 acre-ft (341 hm<sup>3</sup>) for many days, elevation, 94.2 ft (28.71 m); maximum elevation, 94.6 ft (28.83 m) Mar. 3; minimum contents, 231,700 acre-ft (286 hm<sup>3</sup>) Sept. 30, elevation, 91.8 ft (27.98 m).

Capacity table (elevation, in feet, and total contents, in acre-feet)

91.0	217,900	94.0	272,400
92.0	235,300	95.0	292,100
93.0	253,400		

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	272400	272400	272400	274300	272400	270400	270400	272400	272400	270400	259000	242400
2	272400	272400	272400	272400	272400	270400	272400	272400	272400	270400	257100	242400
3	272400	272400	272400	272400	272400	274300	270400	270400	272400	270400	257100	240600
4	274300	272400	272400	272400	272400	274300	272400	272400	272400	270400	257100	240600
5	274300	274300	272400	272400	272400	274300	270400	272400	272400	270400	257100	238800
6	272400	274300	276200	272400	272400	272400	270400	272400	272400	270400	255300	238800
7	274300	272400	272400	272400	272400	272400	270400	272400	274300	270400	255300	242400
8	272400	272400	272400	272400	272400	272400	270400	272400	272400	270400	255300	240600
9	272400	272400	272400	272400	276200	272400	270400	272400	272400	268500	253400	240600
10	272400	272400	272400	272400	274300	270400	270400	272400	272400	268500	253400	240600
11	272400	276200	274300	272400	272400	272400	270400	272400	272400	266600	253400	238800
12	272400	276200	274300	272400	272400	272400	270400	272400	272400	266600	253400	238800
13	272400	272400	274300	274300	272400	272400	268500	272400	272400	266600	253400	240600
14	272400	272400	272400	272400	272400	274300	268500	272400	272400	266600	251600	238800
15	276200	272400	274300	272400	272400	274300	270400	270400	272400	266600	251600	238800
16	276200	272400	272400	272400	272400	272400	272400	272400	272400	266600	251600	238800
17	272400	272400	272400	272400	272400	272400	272400	272400	272400	266600	249700	238800
18	272400	272400	272400	272400	274300	274300	272400	272400	270400	266600	249700	238800
19	272400	272400	272400	272400	274300	276200	274300	270400	268500	264700	249700	238800
20	272400	272400	272400	274300	272400	274300	274300	272400	266600	264700	249700	238800
21	272400	274300	272400	274300	272400	274300	272400	272400	268500	264700	247900	238800
22	272400	272400	272400	274300	270400	272400	272400	268500	268500	264700	246100	237000
23	272400	272400	272400	274300	272400	272400	272400	272400	270400	264700	246100	237000
24	274300	272400	272400	274300	272400	274300	272400	272400	272400	262800	246100	235300
25	274300	272400	274300	274300	272400	274300	274300	272400	272400	262800	244200	235300
26	272400	272400	272400	272400	272400	272400	272400	272400	272400	260900	244200	235300
27	272400	276200	272400	272400	270400	274300	272400	272400	272400	260900	244200	235300
28	274300	274300	272400	274300	272400	272400	272400	272400	272400	260900	244200	235300
29	274300	272400	272400	272400	---	272400	272400	272400	270400	259000	242400	233500
30	272400	272400	276200	274300	---	272400	272400	272400	270400	259000	242400	231700
31	272400	---	272400	272400	---	274300	---	270400	---	257100	242400	---
(+)	94.0	94.0	94.0	94.0	94.0	94.1	94.0	93.9	93.9	93.2	92.4	91.8
(*)	0	0	0	0	0	+1900	-1900	-2000	0	+13300	-14700	-10700
MAX	276200	276200	276200	276200	274300	276200	274300	272400	274300	270400	259000	242400
MIN	272400	272400	272400	272400	270400	270400	268500	268500	266600	257100	242400	231700
CAL YR 1976	MAX	276200	MIN	233500	*	+15300						
WTR YR 1977	MAX	276200	MIN	231700	*	-40700						

+ Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.



## NUECES RIVER BASIN

## 08211000 NUECES RIVER NEAR MATHIS, TX

LOCATION.--Lat 28°02'17", long 97°51'36", San Patricio-Jim Wells County line, Hydrologic Unit 12110111, on left bank 6 ft (2 m) downstream from pier of bridge on State Highway 359, 200 ft (61 m) downstream from Texas and New Orleans Railroad Co. bridge, 0.6 mi (1.0 km) downstream from Wesley E. Seale Dam, 4 mi (6 km) southwest of Mathis, and at mile 46.7 (75.1 km).

DRAINAGE AREA.--16,660 mi<sup>2</sup> (43,150 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1939 to current year.

GAGE.--Water-stage recorder. Datum of gage is 27.53 ft (8.391 m) above mean sea level.

REMARKS.--Water-discharge records good. Flow is regulated by Lake Corpus Christi (station 08210500) 0.6 mi (1.0 km) upstream. Upstream from Lake Corpus Christi, flow is affected by recharge to permeable formations, small diversions, and minor regulation. Water for municipal and industrial uses at Corpus Christi is released from Lake Corpus Christi above gage and is diverted from river at Calallen 34 mi (55 km) downstream.

AVERAGE DISCHARGE.--38 years, 875 ft<sup>3</sup>/s (24.78 m<sup>3</sup>/s), 633,900 acre-ft/yr (782 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 138,000 ft<sup>3</sup>/s (3,910 m<sup>3</sup>/s) Sept. 24, 1967, gage height, 47.7 ft (14.54 m), from flood-mark; minimum daily, 6.8 ft<sup>3</sup>/s (0.19 m<sup>3</sup>/s) Aug. 15, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1888, that of Sept. 24, 1967. A stage of about 40 ft (12 m) occurred Sept. 20, 1919, from information by Texas and New Orleans Railroad Co. and is the second highest known.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 16,900 ft<sup>3</sup>/s (479 m<sup>3</sup>/s) Apr. 20, gage height, 29.22 ft (8.906 m); minimum daily, 44 ft<sup>3</sup>/s (1.25 m<sup>3</sup>/s) Sept. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1630	9900	1160	555	628	244	237	2140	1460	162	110	109
2	768	10200	1060	1330	670	238	185	1610	1440	160	117	107
3	947	10800	1050	436	497	250	176	1800	1370	162	107	45
4	1220	12600	1010	425	573	193	742	1310	1110	161	102	44
5	5360	13700	530	460	729	191	168	1260	298	146	98	56
6	5510	13300	981	668	468	448	93	1460	396	149	95	116
7	6520	11800	912	399	450	216	94	1320	740	146	94	69
8	3980	7260	389	412	476	182	103	950	707	145	87	69
9	1700	4700	530	707	434	172	104	1580	459	146	91	69
10	1160	3360	757	433	639	178	102	1100	413	143	87	69
11	1670	2950	694	230	1160	585	100	1760	337	142	87	68
12	2010	3850	976	806	1360	288	100	2040	333	141	83	81
13	1960	3260	946	1410	340	178	100	1730	348	141	79	79
14	2100	1900	1150	1170	329	173	593	2500	343	140	79	77
15	1630	2290	1200	850	466	178	3460	2690	398	139	89	66
16	2270	2350	2660	981	316	246	8540	843	615	142	96	59
17	3400	1040	2530	752	254	284	11500	1040	755	139	91	60
18	2360	1110	2020	892	344	260	14300	1130	698	139	100	60
19	2240	1680	5590	431	554	396	14400	1230	659	138	98	59
20	782	1550	5610	421	607	247	15600	1390	422	138	87	85
21	659	1330	3490	444	442	298	11600	1620	239	137	81	110
22	893	1340	3440	851	318	260	7150	1330	240	138	90	83
23	374	1520	2950	1230	395	163	10200	1360	244	137	97	75
24	331	1440	3490	1420	253	218	12300	1370	248	137	113	67
25	799	1370	3160	1550	256	192	10800	1100	329	137	122	67
26	1980	1650	2520	1420	1010	172	6410	1060	469	125	99	92
27	2300	2190	2060	1190	332	427	2370	1040	377	115	80	110
28	2450	2910	2630	1100	256	309	2460	1030	329	111	75	63
29	4290	1590	1080	774	---	272	2190	1050	283	111	61	86
30	8420	1610	577	569	---	303	3000	1100	232	111	74	149
31	7960	---	846	592	---	328	---	1380	---	110	73	---
TOTAL	79673	136550	57998	24908	14556	8089	139177	44323	16291	4288	2842	2349
MEAN	2570	4552	1871	803	520	261	4639	1430	543	138	91.7	78.3
MAX	8420	13700	5610	1550	1360	585	15600	2690	1460	162	122	149
MIN	331	1040	389	230	253	163	93	843	232	110	61	44
AC-FT	158000	270800	115000	49410	28870	16040	276100	87910	32310	8510	5640	4660
CAL YR 1976	TOTAL	467987	MEAN	1279	MAX	13700	MIN 33	AC-FT	928300			
WTR YR 1977	TOTAL	531044	MEAN	1455	MAX	15600	MIN 44	AC-FT	1053000			

08211000 NUECES RIVER NEAR MATHIS, TX--Continued

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1947 to current year. Chemical and biochemical analyses: October 1969 to September 1970.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1947 to current year.  
WATER TEMPERATURES: October 1947 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,580 micromhos Apr. 19, 20, 1977; minimum daily, 216 micromhos Sept. 19, 1971.  
WATER TEMPERATURES (1947-76): Maximum daily, 36.0°C Aug. 8, 1964; minimum daily, 3.0°C Jan. 19, 1968.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,580 micromhos Apr. 19, 20; minimum daily, 398 micromhos Nov. 12.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 28...	1600	1500	507	8.2	160	29	51	7.3	34
NOV 28...	1600	3200	401	8.2	120	18	40	4.5	29
JAN 19...	1600	370	791	8.1	210	84	70	7.8	72
MAR 26...	1600	140	1290	7.9	320	180	110	12	130
APR 20...	1600	15000	1560	7.8	360	230	120	15	160
MAY 23...	1600	1400	679	7.7	170	79	56	7.2	60
JUL 28...	1600	110	707	7.6	190	81	59	9.7	61

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 28...	1.2	7.1	156	0	35	57	.2	17	286
NOV 28...	1.2	5.6	122	0	23	47	.2	14	223
JAN 19...	2.2	6.0	150	0	45	140	.1	12	427
MAR 26...	3.1	6.3	180	0	69	270	.2	13	699
APR 20...	3.7	6.5	160	0	100	370	.1	8.7	859
MAY 23...	2.0	6.4	110	0	47	120	.1	10	361
JUL 28...	1.9	6.5	130	0	56	110	.2	8.8	375

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCTANCE (MICROMHOS)	DIS-SOLVED SOLIDS (MG/L)	DIS-SOLVED SOLIDS (TONS)	DIS-SOLVED CHLORIDE (MG/L)	DIS-SOLVED CHLORIDE (TONS)	DIS-SOLVED SULFATE (MG/L)	DIS-SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	79673	543	300	64400	73	15700	35	7550	160
NOV. 1976.....	136550	447	250	92700	51	18800	28	10200	140
DEC. 1976.....	57998	509	280	44300	65	10200	32	5060	150
JAN. 1977.....	24908	787	420	28200	130	9030	51	3430	210
FEB. 1977.....	14556	952	500	19700	180	7230	62	2430	240
MAR. 1977.....	8089	1210	650	14200	260	5700	78	1710	300
APR. 1977.....	139177	1280	690	261000	280	105000	82	30900	310
MAY 1977.....	44323	741	400	47600	120	14500	48	5750	200
JUNE 1977.....	16291	668	360	15800	100	4400	43	1900	180
JULY 1977.....	4288	691	370	4320	110	1270	45	518	190
AUG. 1977.....	2842	724	390	2980	120	894	47	359	190
SEPT 1977.....	2349	755	400	2560	120	793	49	310	200
TOTAL .....	531044	**	**	598000	**	194000	**	70100	**
WTD.AVG. ....	1454.92	764	420	**	130	**	49	**	200

08211000 NUECES RIVER NEAR MATHIS, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	619	489	406	706	882	1110	1320	848	672	677	714	740
2	619	478	408	712	889	1100	1340	881	655	677	711	740
3	619	481	412	706	890	1130	1340	842	657	679	714	745
4	616	489	415	706	890	1130	1360	842	663	679	714	745
5	605	479	415	710	890	1130	1360	836	675	679	714	745
6	602	472	417	719	900	1130	1360	836	667	679	714	750
7	589	448	418	734	908	1160	1360	784	661	679	716	747
8	557	405	421	743	926	1150	1360	784	667	684	716	742
9	568	413	422	748	922	1140	1370	759	667	684	721	745
10	568	407	425	766	922	1150	1370	759	663	683	718	745
11	553	404	438	766	922	1170	1370	763	671	690	714	747
12	540	398	440	769	923	1170	1370	735	671	685	723	753
13	533	401	440	764	923	1180	1370	745	671	689	721	753
14	538	399	445	757	934	1170	1380	745	670	689	723	753
15	533	402	448	752	934	1180	1390	735	670	695	725	753
16	533	402	448	767	942	1210	1390	735	670	694	723	753
17	526	402	455	800	950	1190	1480	726	670	696	723	755
18	522	399	462	794	950	1250	1530	719	670	694	725	755
19	523	402	482	805	974	1250	1580	705	670	694	725	760
20	511	403	518	805	1000	1270	1580	697	671	690	725	755
21	520	400	521	805	991	1250	1450	678	673	694	725	758
22	523	406	530	842	1010	1270	1300	674	673	696	725	766
23	538	400	542	811	1060	1280	1030	674	669	703	728	760
24	511	400	567	805	1050	1280	861	674	675	701	728	763
25	509	400	563	814	1060	1280	778	654	675	701	733	763
26	509	400	574	838	1080	1280	772	658	673	703	740	760
27	509	400	620	814	1090	1280	1170	658	675	705	733	768
28	509	400	618	814	1100	1280	1030	658	675	705	738	766
29	506	403	635	858	---	1280	1000	657	675	706	738	766
30	501	406	637	888	---	1310	940	656	701	706	741	769
31	496	---	702	925	---	1310	---	653	---	708	751	---
MEAN	545	420	492	762	961	1210	1280	735	671	692	724	754

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

[illegible]

## 08211520 OSO CREEK AT CORPUS CHRISTI, TX

LOCATION.--Lat 27°42'40", long 97°30'06", Nueces County, Hydrologic Unit 12110202, on left downstream end of bridge on Farm Road 763, 1.5 mi (2.4 km) south of intersection of Farm Roads 763 and 665, 1.6 mi (2.6 km) downstream from mouth of West Oso Creek, and 1.9 mi (3.1 km) southwest of intersection of Farm Road 665 and State Highway 357.

DRAINAGE AREA.--90.3 mi<sup>2</sup> (233.9 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1972 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1.91 ft (0.582 m) below mean sea level.

REMARKS.--Water-discharge records good. No known diversions above station. An undetermined amount of water from oilfield operations enters stream upstream at various points. Recording rain gage is located at station.

AVERAGE DISCHARGE.--5 years, 34.6 ft<sup>3</sup>/s (0.980 m<sup>3</sup>/s), 25,070 acre-ft/yr (309 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,110 ft<sup>3</sup>/s (173 m<sup>3</sup>/s) Oct. 12, 1973, gage height, 26.09 ft (7.952 m); minimum, 0.25 ft<sup>3</sup>/s (0.07 m<sup>3</sup>/s) Aug. 26, 27, 1973.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1919, that of Oct. 12, 1973. A stage of about 24.5 ft (7.47 m) occurred in May 1968, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft<sup>3</sup>/s (8.50 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 5	2000	1,230	34.8	16.21	4.941	Jan. 13	2200	377	10.7	10.34	3.152
Oct. 29	1600	359	10.2	10.19	3.106	Apr. 17	0200	370	10.5	10.28	3.133
Nov. 19	1000	934	26.5	14.35	4.374	May 1	0400	*2,240	63.4	20.60	6.279
Nov. 29	0800	380	10.8	10.36	3.158						

Minimum discharge, 0.52 ft<sup>3</sup>/s (0.015 m<sup>3</sup>/s) June 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.9	39	44	6.7	9.4	3.5	3.4	1600	1.4	1.3	1.4	16
2	5.0	24	29	14	17	3.6	3.3	545	1.4	.97	1.4	27
3	4.3	17	18	33	55	5.4	3.1	198	1.4	.72	1.3	4.5
4	4.2	14	12	27	27	5.1	2.8	50	1.4	.69	1.3	1.8
5	771	12	49	16	14	3.7	2.6	19	1.5	.62	1.6	1.8
6	676	11	53	12	9.1	3.6	2.6	9.9	1.5	.66	1.3	1.6
7	261	10	29	9.5	7.2	3.3	2.5	6.4	1.4	.73	1.3	1.6
8	98	9.5	17	8.2	6.3	3.3	2.5	4.7	1.6	.80	1.4	7.3
9	46	9.3	12	7.4	5.9	3.2	2.5	4.4	1.7	.73	1.4	2.4
10	24	9.1	10	6.5	7.5	3.4	2.5	4.0	1.7	.81	1.4	2.6
11	13	8.9	9.2	6.2	30	3.3	2.5	14	1.7	1.7	1.4	2.2
12	8.5	79	51	44	21	3.1	2.5	121	1.8	1.1	1.3	2.0
13	6.2	33	70	271	15	3.2	2.5	161	1.5	.89	1.3	2.9
14	4.9	20	131	292	11	3.2	3.0	38	1.7	.92	1.7	2.9
15	7.8	16	139	129	8.0	3.2	3.2	13	42	.89	2.2	1.4
16	26	13	72	42	6.5	3.1	79	7.0	9.9	.91	1.5	1.4
17	13	37	35	19	5.9	3.1	209	5.9	1.2	1.3	1.2	1.4
18	13	207	21	12	5.5	3.0	32	4.6	.77	1.4	1.2	1.4
19	10	796	16	8.6	4.9	2.9	11	3.3	.80	1.3	1.3	1.3
20	7.4	637	13	7.1	4.5	2.8	6.5	4.1	1.2	2.0	1.8	1.3
21	5.7	259	10	6.3	4.4	2.8	4.5	3.1	.71	1.5	1.7	1.3
22	4.8	90	8.9	7.3	4.5	2.7	3.5	3.3	.66	1.1	1.8	1.3
23	4.3	39	9.4	8.6	4.1	2.6	2.6	3.3	6.9	1.1	3.0	1.3
24	4.9	23	8.8	7.3	4.0	2.8	2.4	3.3	4.9	1.2	2.2	1.3
25	5.8	16	8.6	6.5	4.0	2.9	2.4	22	18	1.1	2.0	1.4
26	4.6	12	7.9	6.2	3.8	2.9	2.3	29	10	1.1	1.8	1.4
27	114	10	7.6	5.8	3.5	3.0	2.4	7.1	4.5	1.0	2.4	1.3
28	271	230	7.3	5.4	3.5	3.7	2.3	3.1	2.4	1.1	1.8	1.3
29	343	317	6.9	4.8	---	3.8	2.4	2.0	1.6	1.3	1.3	1.3
30	222	113	6.9	5.0	---	3.6	708	1.7	1.7	1.4	1.2	1.4
31	78	---	6.7	5.3	---	3.5	---	1.4	---	1.5	2.1	---
TOTAL	3064.3	3110.8	919.2	1039.7	302.5	103.3	1111.8	2892.6	128.94	33.84	50.0	98.1
MEAN	98.8	104	29.7	33.5	10.8	3.33	37.1	93.3	4.30	1.09	1.61	3.27
MAX	771	796	139	292	55	5.4	708	1600	42	2.0	3.0	27
MIN	4.2	8.9	6.7	4.8	3.5	2.6	2.3	1.4	.66	.62	1.2	1.3
AC-FT	6080	6170	1820	2060	600	205	2210	5740	256	67	99	195

CAL YR 1976 TOTAL 20142.48 MEAN 55.0 MAX 3000 MIN .98 AC-FT 39950  
WTR YR 1977 TOTAL 12855.08 MEAN 35.2 MAX 1600 MIN .62 AC-FT 25500

## OSO CREEK BASIN

08211520 OSO CREEK AT CORPUS CHRISTI, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: July 1972 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	HARD- NESS (CA,MG) (MG/L)
OCT 13...	1225	6.3	2810	7.3	24.0	25	9.0	110	1.7	560
NOV 17...	1345	42	919	7.6	11.0	330	11.1	104	2.2	170
JAN 03...	1535	36	1290	7.5	7.0	150	11.9	101	4.9	230
FEB 14...	1505	11	3380	8.1	21.0	30	12.5	144	4.2	570
MAR 28...	1537	3.9	9160	8.0	22.0	15	13.4	158	2.3	1500
MAY 10...	1105	4.2	6960	7.6	26.0	15	8.5	106	4.2	1200
JUN 20...	1650	2.0	6800	8.5	31.5	20	16.0	216	7.0	1100
AUG 02...	1245	1.5	6720	8.4	32.0	30	9.1	125	7.8	1000
SEP 12...	1625	1.9	5100	8.1	32.5	35	8.9	122	3.8	780
DATE	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
OCT 13...	430	180	26	350	6.5	10	159	0	99	780
NOV 17...	89	56	7.9	120	4.0	5.8	102	0	40	210
JAN 03...	130	75	11	170	4.9	8.8	124	0	79	300
FEB 14...	440	180	29	440	8.0	11	160	0	160	920
MAR 28...	1300	470	74	1500	17	23	224	0	310	2900
MAY 10...	1100	390	64	990	12	14	219	0	240	2000
JUN 20...	940	340	58	1000	13	19	160	8	240	2100
AUG 02...	890	320	53	1100	15	21	150	6	250	2100
SEP 12...	650	240	43	730	11	20	150	0	180	1500
DATE	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT 13...	.3	180	1700	48	.95	.04	.19	.69	.61	4.2
NOV 17...	.3	10	501	732	.93	.02	.10	1.6	.50	15
JAN 03...	.3	12	717	265	5.7	.26	.22	1.5	2.9	16
FEB 14...	.2	9.9	1830	82	2.8	.15	.28	1.2	1.2	8.2
MAR 28...	.2	14	5400	39	3.4	.30	.43	1.6	4.3	--
MAY 10...	.2	19	3830	16	2.2	.10	.10	1.4	1.1	8.0
JUN 20...	.2	13	3860	43	1.2	.07	.03	1.7	1.4	13
AUG 02...	.1	15	3940	65	8.2	.18	.19	1.5	.98	11
SEP 12...	.2	21	2810	84	8.2	.19	.17	.93	4.4	10

## OSO CREEK BASIN

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08211520 OSO CREEK AT CORPUS CHRISTI, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)
NOV 17...	1345	32	100	0	0	3	10
MAR 28...	1537	12	600	0	2	3	20
AUG 02...	1245	20	800	0	10	3	20

DATE	DIS- SOLVED LEAD (PB) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
NOV 17...	0	50	.0	0	0	20
MAR 28...	0	1400	.4	0	0	30
AUG 02...	0	320	.0	1	0	10

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MA- TERIAL (UG/KG)	POLY- CHLO- RINATED NAPH- THA- LENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)
NOV 17...	1345	--	0	--	--	.0	--	1	--	1.0	--	1.4
AUG 02...	1245	.0	0	.00	.00	.0	.0	0	.00	1.8	.00	.9

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
NOV 17...	--	.7	.01	--	.1	--	.0	.00	--	.0	--	.0
AUG 02...	.00	.9	.11	.00	.2	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 17...	--	.0	.00	.00	.00	.00	--	0	.00	.00	.00	.00
AUG 02...	.06	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00



## SAN FERNANDO CREEK BASIN

08211800 SAN DIEGO CREEK AT ALICE, TX

LOCATION.--Lat 27°45'59", long 98°04'31", Jim Wells County, Hydrologic Unit 12110204, at bridge on Edith Drive in Alice, 540 ft (165 m) downstream from Texas and New Orleans Railroad Co. bridge, and 3.2 mi (5.1 km) upstream from confluence with Chiltipin Creek.

DRAINAGE AREA.--319 mi<sup>2</sup> (826 km<sup>2</sup>).

PERIOD OF RECORD.--September 1963 to current year.

REVISED RECORDS.--WDR TX-72-1: 1971.

GAGE.--Water-stage recorder. Datum of gage is 189.60 ft (57.790 m) above mean sea level.

REMARKS.--Records good. Flow is affected at times by discharge from flood-detention pools of 10 floodwater-retarding structures with combined detention capacity of 35,980 acre-ft (44.4 hm<sup>3</sup>). These structures control runoff from 170 mi<sup>2</sup> (440 km<sup>2</sup>) in the San Diego-Rosita drainage basins. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--14 years, 12.0 ft<sup>3</sup>/s (0.340 m<sup>3</sup>/s), 8,690 acre-ft/yr (10.7 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,200 ft<sup>3</sup>/s (544 m<sup>3</sup>/s) Oct. 17, 1971, gage height, 17.70 ft (5.395 m); no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1928, 18.2 ft (5.55 m) April 1949, equivalent gage height in channel modified in 1955, 17.2 ft (5.24 m), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 342 ft<sup>3</sup>/s (9.69 m<sup>3</sup>/s) Oct. 5, gage height, 5.95 ft (1.814 m), no other peak above base of 250 ft<sup>3</sup>/s (7.08 m<sup>3</sup>/s); no flow Aug. 24-27, Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.07	2.0	4.3	2.1	2.5	1.1	1.5	12	.75	.76	.06	.03
2	.04	1.3	3.0	4.0	2.8	.77	1.6	5.4	.75	.75	.05	.05
3	.03	1.6	2.5	3.1	3.0	1.1	1.5	2.3	.70	.67	.06	.05
4	.02	1.1	2.4	4.4	2.5	1.3	1.2	1.8	.55	.62	.06	.05
5	76	.77	2.7	4.0	2.3	1.2	1.0	1.6	.60	.62	.05	.05
6	11	.69	3.0	3.0	2.0	1.2	.93	1.6	.60	.55	.05	.07
7	3.6	.70	2.6	2.4	1.9	1.1	.81	1.5	.70	.52	.04	.12
8	1.8	.71	2.5	2.4	1.9	1.1	.81	1.3	.75	.48	.05	.43
9	.68	.61	2.0	2.5	2.0	1.2	.87	15	.70	.43	.04	1.7
10	.58	.63	1.9	1.9	2.9	1.2	.93	12	.50	.37	.04	.59
11	.57	.52	1.9	2.2	3.7	1.3	.87	5.7	.39	.34	.05	.37
12	.36	.37	6.3	5.0	4.8	1.2	1.1	2.1	.35	.25	.09	.29
13	.28	.41	5.4	8.7	2.7	1.1	1.1	1.7	.39	.20	.08	.26
14	.25	.60	13	11	1.7	1.1	1.2	1.6	.39	.21	.07	.85
15	.30	.60	12	7.2	1.4	1.2	1.4	1.5	.51	.24	.06	1.0
16	4.3	.71	7.2	4.2	1.2	1.4	2.2	1.3	.46	.32	.06	1.2
17	3.0	3.7	4.1	3.2	1.1	1.4	2.2	1.4	.56	.45	.05	.79
18	2.2	8.7	3.0	2.7	1.0	1.2	2.8	1.5	.86	.70	.04	.58
19	1.0	24	6.6	2.3	1.0	1.3	2.4	1.5	.47	.69	.04	.51
20	.53	23	7.4	2.3	1.1	1.2	2.2	1.3	.33	.59	.04	.45
21	.36	9.7	6.8	2.4	1.1	1.1	1.7	1.2	1.9	.57	.02	.32
22	.32	3.9	3.9	4.1	1.0	.93	1.7	1.7	1.6	.35	.01	.30
23	.33	2.5	3.3	4.1	1.1	1.0	1.3	2.8	2.6	.33	.01	.31
24	.36	2.3	3.0	5.3	1.2	1.3	1.2	2.1	18	.24	.00	.30
25	.35	3.2	3.2	4.0	1.1	1.4	1.2	1.8	9.1	.20	.00	.26
26	.73	3.1	2.7	2.9	.96	1.6	1.2	1.5	2.9	.16	.00	.18
27	2.1	2.7	2.3	2.6	.88	1.7	1.2	1.2	1.9	.12	.00	.07
28	21	11	2.1	2.3	1.6	1.6	1.1	1.2	1.4	.09	.01	.02
29	32	11	2.0	2.0	---	1.4	1.0	1.1	1.0	.12	.09	.01
30	14	7.3	2.2	2.0	---	1.2	5.4	.93	.91	.09	.04	.00
31	5.2	---	1.7	2.0	---	1.4	---	.81	---	.07	.03	---
TOTAL	183.36	129.42	127.0	112.3	52.44	38.30	45.62	90.44	52.62	12.10	1.29	11.21
MEAN	5.91	4.31	4.10	3.62	1.87	1.24	1.52	2.92	1.75	.39	.042	.37
MAX	76	24	13	11	4.8	1.7	5.4	15	18	.76	.09	1.7
MIN	.02	.37	1.7	1.9	.88	.77	.81	.33	.33	.07	.00	.00
AC-FT	364	257	252	223	104	76	90	179	104	24	2.6	22

CAL YR 1976 TOTAL 1549.31 MEAN 4.23 MAX 349 MIN .00 AC-FT 3070  
WTR YR 1977 TOTAL 856.10 MEAN 2.35 MAX 76 MIN .00 AC-FT 1700

## 08211850 LAKE ALICE AT ALICE, TX

LOCATION.--Lat 27°47'25", long 98°03'39", Jim Wells County, Hydrologic Unit 12110204, on right bank just upstream from Alice Dam on Chiltipin Creek, 1.8 mi (2.9 km) upstream from confluence of Chiltipin and San Diego Creeks, and 2.6 mi (4.2 km) northeast of Alice.

DRAINAGE AREA.--150 mi<sup>2</sup> (388 km<sup>2</sup>).

PERIOD OF RECORD.--December 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level (levels by city of Alice).

REMARKS.--The lake is formed by a rolled earthfill dam, which has a total length of 11,525 ft (3,513 m). The dam consists of the main embankment 3,470 ft (1,060 m) long and two protective levees. The west protective levee is 4,275 ft (1,303 m) long and the east protective levee is 2,343 ft (714 m) long. Storage began Oct. 26, 1964, and the dam was completed Mar. 16, 1965. The emergency spillway is 1,000 ft (305 m) wide and is located between the main embankment and the west levee. Collapsible flashboards, 3.5 ft (1.1 m) high, were added to the crest of the emergency spillway. The main spillway is 414 ft (126 m) wide with thirteen 30-foot-wide (9 m) slots for gates, but no gates have been installed at the present time. The main spillway is located between the main embankment and the east levee. The service spillway is a concrete siphon type spillway, 22.5 ft (6.9 m) wide with a 3.5 ft (1.1 m) opening, and is located in the main embankment section. The dam is the property of the Alice Water Authority and was built to store water for use by the city of Alice. The area and capacity tables are based on revised maps surveyed in 1963. Records furnished by the city of Alice show that 3,740 acre-ft (4.61 hm<sup>3</sup>) was diverted during the current year for municipal use. Records furnished by the city of Corpus Christi show that 1,640 acre-ft (2.02 hm<sup>3</sup>) was diverted to Lake Alice from Lake Corpus Christi during the current year. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	205.0	-
Top of west levee.....	202.0	-
Top of collapsible flashboards.....	199.5	5,300
Top of east levee.....	199.0	4,910
Crest of main spillway.....	196.5	3,110
Crest of spillway.....	196.0	2,780
Crest of siphon spillway (lowest outlet).....	196.0	2,780

COOPERATION.--The area and capacity tables are furnished by the Alice Water Authority.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 4,780 acre-ft (5.89 hm<sup>3</sup>) Sept. 12, 1971, elevation, 198.83 ft (60.603 m), from flood-mark; minimum, 14 acre-ft (17,300 m<sup>3</sup>) Feb. 3, 1965, elevation, 185.67 ft (56.592 m).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 2,900 acre-ft (3.58 hm<sup>3</sup>) Dec. 20, elevation, 196.18 ft (59.796 m); minimum, 192 acre-ft (0.237 hm<sup>3</sup>) Sept. 30, elevation, 189.98 ft (57.906 m).

Capacity table (elevation, in feet, and total contents, in acre-feet)

189.5	127	193.0	1,160
190.0	195	194.0	1,640
190.5	288	195.0	2,180
191.0	423	196.0	2,780
192.0	754	197.0	3,440

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1460	2690	2850	2720	2620	2330	1850	1350	939	652	400	243
2	1440	2690	2840	2720	2640	2330	1840	1340	919	628	394	246
3	1420	2680	2830	2740	2620	2320	1820	1340	884	608	383	246
4	1390	2660	2820	2740	2620	2300	1800	1330	856	578	375	246
5	2470	2650	2830	2720	2610	2290	1770	1300	837	551	366	246
6	2410	2640	2800	2720	2590	2260	1740	1290	818	535	361	246
7	2420	2620	2760	2710	2590	2260	1720	1280	795	535	355	256
8	2430	2620	2750	2680	2580	2240	1700	1270	765	529	349	248
9	2410	2620	2740	2660	2580	2220	1680	1300	743	529	341	241
10	2430	2610	2740	2660	2610	2200	1650	1280	725	523	333	239
11	2440	2610	2730	2670	2630	2180	1620	1320	704	519	320	239
12	2440	2590	2780	2720	2620	2160	1610	1310	690	513	328	235
13	2420	2570	2790	2750	2610	2140	1590	1290	669	510	320	230
14	2410	2560	2830	2760	2600	2120	1570	1260	641	513	303	228
15	2440	2550	2840	2750	2580	2120	1550	1250	631	510	298	232
16	2440	2560	2840	2730	2560	2100	1560	1230	631	510	291	235
17	2440	2620	2830	2720	2550	2080	1560	1190	631	500	288	235
18	2420	2680	2830	2700	2540	2060	1540	1180	631	491	286	237
19	2400	2850	2890	2690	2530	2040	1520	1160	631	494	277	232
20	2370	2870	2850	2690	2520	2010	1520	1140	624	491	273	228
21	2350	2860	2840	2700	2500	2000	1500	1140	645	487	268	228
22	2330	2850	2840	2710	2480	1970	1480	1130	676	487	256	225
23	2330	2850	2840	2710	2480	1950	1460	1120	715	484	244	221
24	2320	2850	2830	2690	2450	1950	1430	1100	722	472	244	218
25	2300	2870	2830	2690	2430	1930	1420	1090	729	469	241	211
26	2300	2880	2810	2690	2400	1920	1390	1070	725	462	239	208
27	2430	2860	2800	2680	2380	1920	1350	1050	733	459	234	206
28	2590	2860	2780	2660	2360	1910	1330	1020	725	450	234	202
29	2690	2850	2760	2650	---	1890	1320	997	701	444	237	197
30	2720	2850	2750	2630	---	1880	1370	980	680	429	239	192
31	2710	---	2720	2620	---	1860	---	951	---	406	241	---
(†)	195.89	196.10	195.91	195.75	195.32	194.44	193.46	192.51	191.79	190.94	190.27	189.98
(*)	+1230	+140	-130	-100	-260	-500	-490	-419	-271	-274	-165	-49
MAX	2720	2880	2890	2760	2640	2330	1850	1350	939	652	400	256
MIN	1390	2550	2720	2620	2360	1860	1320	951	624	406	234	192

CAL YR 1976..... \* +2443

WTR YR 1977..... \* -1288

MAX 3290 MIN 262  
MAX 2890 MIN 192

† Elevation, in feet, at end of month.

\* Change in contents, in acre-feet.

## SAN FERNANDO CREEK BASIN

## 08211900 SAN FERNANDO CREEK AT ALICE, TX

LOCATION.--Lat 27°46'20", Long 98°02'00", Jim Wells County, Hydrologic Unit 12110204, on left bank 34 ft (10 m) downstream from downstream bridge of two bridges on State Highways 44 and 359, 0.5 mi (0.8 km) downstream from confluence of San Diego and Chiltipin Creeks, 2.3 mi (3.7 km) upstream from head of Pintas Creek, and 2.7 mi (4.3 km) northeast of Alice.

DRAINAGE AREA.--507 mi<sup>2</sup> (1,313 km<sup>2</sup>).

PERIOD OF RECORD.--December 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 161.68 ft (49.280 m) above mean sea level.

REMARKS.--Records good. San Diego Creek joins Chiltipin Creek below Lake Alice to form San Fernando Creek. Flow regulated by Lake Alice (station 08211850) 2.3 mi (3.7 km) upstream from Chiltipin Creek since Oct. 26, 1964. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see San Diego Creek at Alice (station 08211800). Records furnished by city of Alice show that 2,430 acre-ft (3.00 hm<sup>3</sup>) of sewage effluent was discharged into San Diego Creek 1.3 mi (2.1 km) upstream, which comprises most of the low flow. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--12 years (water years 1966-77), 31.5 ft<sup>3</sup>/s (0.892 m<sup>3</sup>/s), 22,820 acre-ft/yr (28.1 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,800 ft<sup>3</sup>/s (759 m<sup>3</sup>/s) Sept. 12, 1971, gage height, 16.51 ft (5.032 m); no flow part of each day Aug. 23-26, Sept. 14, 1965, several days in June, July, and August 1967, and part of Dec. 27, 1972.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1949, that of Sept. 12, 1971. Other high stages for this period are 15.86 ft (4.834 m) Sept. 23, 1967, discharge 16,900 ft<sup>3</sup>/s (479 m<sup>3</sup>/s); 15.5 ft (4.72 m) Sept. 9, 1962, discharge 14,600 ft<sup>3</sup>/s (413 m<sup>3</sup>/s) from field estimate; 14.2 ft (4.33 m) Sept. 14, 1951. Discharge for flood of Sept. 14, 1951, may have exceeded that for 1962 as the highway was raised between 1952 and 1962. Flood in 1951 was higher at site of discontinued station "San Fernando Creek near Alice." Flood in 1962 was higher than that of 1967 at site of discontinued station; there is a diversion into the Pintas Creek basin between the two gaging sites, and apparently this diversion was greater in 1967 than in 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,040 ft<sup>3</sup>/s (29.5 m<sup>3</sup>/s) Oct. 5, gage height, 6.20 ft (1.890 m); minimum, 0.22 ft<sup>3</sup>/s (0.006 m<sup>3</sup>/s) Sept. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	7.5	11	3.2	4.0	2.9	2.2	10	1.8	1.9	2.1	1.7
2	1.4	4.7	11	8.5	4.7	3.4	2.5	6.5	1.7	1.9	2.0	1.7
3	1.4	3.4	6.8	9.7	7.0	3.5	2.3	3.6	1.9	1.7	1.7	1.6
4	1.6	3.2	6.1	6.3	6.0	4.1	1.9	2.5	1.7	1.8	1.7	1.5
5	526	2.9	6.2	5.5	4.9	3.6	1.6	2.0	1.6	1.6	1.7	1.5
6	81	2.7	12	6.8	4.4	3.2	1.2	2.2	1.6	1.7	1.8	1.4
7	16	2.5	18	4.4	4.2	3.0	1.4	2.2	1.5	1.5	1.7	1.6
8	9.4	2.4	5.5	4.0	3.6	2.6	1.6	2.1	1.4	1.2	1.7	1.9
9	5.1	2.6	5.3	5.6	3.0	2.9	1.6	12	2.0	1.2	1.7	1.7
10	3.1	2.6	5.3	4.7	9.2	3.2	1.6	19	2.3	1.5	1.7	1.6
11	2.6	2.7	8.2	3.1	18	3.5	1.8	12	2.2	1.1	1.7	1.5
12	2.3	3.1	19	7.4	16	3.0	1.8	10	2.4	1.3	1.9	1.6
13	1.9	4.8	26	38	7.6	2.7	1.8	3.9	2.4	1.4	1.9	1.6
14	2.0	2.8	52	23	4.8	2.2	1.6	2.8	2.1	1.3	1.8	1.7
15	1.8	2.6	38	13	3.8	2.4	1.6	2.5	2.1	1.6	1.8	2.0
16	15	2.3	16	9.2	3.5	3.2	2.6	2.4	2.0	1.6	1.9	2.1
17	11	12	10	6.0	3.1	3.3	2.5	2.2	1.7	1.6	1.6	2.2
18	5.6	33	8.1	7.0	3.0	3.0	2.0	1.9	2.1	1.9	1.6	1.7
19	4.1	105	15	4.4	3.0	3.0	1.9	2.0	2.4	2.1	1.5	1.5
20	3.5	80	46	3.8	2.8	2.6	2.5	2.1	1.9	1.9	1.5	1.3
21	2.1	26	15	3.8	2.8	2.7	2.4	2.2	1.8	.96	1.5	1.3
22	2.1	13	9.8	5.9	3.3	2.2	1.7	3.0	5.2	1.3	1.4	1.3
23	2.3	7.6	8.8	8.7	3.1	1.8	2.0	3.4	6.3	1.8	1.6	1.4
24	2.3	6.4	7.6	7.3	3.0	1.9	1.9	3.4	20	1.6	1.6	.54
25	2.6	7.6	8.5	6.1	2.9	2.2	1.8	3.1	16	1.6	1.6	.72
26	2.4	13	9.4	4.8	8.8	2.6	1.6	2.9	5.3	1.9	1.7	1.5
27	8.9	16	5.3	4.6	3.8	2.7	1.1	2.5	2.9	2.3	1.6	1.5
28	99	67	8.9	5.3	2.5	2.8	1.6	2.4	2.5	2.4	1.7	1.4
29	183	42	4.2	5.4	---	2.5	1.8	2.5	1.8	2.4	1.8	1.5
30	46	18	3.7	3.3	---	2.3	7.4	2.3	2.2	2.3	1.9	1.5
31	15	---	6.8	5.2	---	1.8	---	2.1	---	2.1	1.6	---
TOTAL	1061.9	499.4	413.5	234.0	146.8	86.8	61.3	133.7	102.8	52.46	53.0	46.06
MEAN	34.3	16.6	13.3	7.55	5.24	2.80	2.04	4.31	3.43	1.69	1.71	1.54
MAX	526	105	52	38	18	4.1	7.4	19	20	2.4	2.1	2.2
MIN	1.4	2.3	3.7	3.1	2.5	1.8	1.1	1.9	1.4	.96	1.4	.54
AC-FT	2110	991	820	464	291	172	122	265	204	104	105	91
CAL YR 1976	TOTAL	8675.36	MEAN	23.7	MAX	3350	MIN	.84	AC-FT	17210		
WTR YR 1977	TOTAL	2891.72	MEAN	7.92	MAX	526	MIN	.54	AC-FT	5740		

08212400 LOS OLMOS CREEK NEAR FALFURRIAS, TX  
(National stream-quality accounting network)

LOCATION.--Lat 27°15'51", long 98°08'08", Brooks County, Hydrologic Unit 12110205, at downstream side of bridge on U.S. Highway 281 and 2.6 mi (4.2 km) north of Falfurrias.

DRAINAGE AREA.--480 mi<sup>2</sup> (1,243 km<sup>2</sup>), of which 4.5 mi<sup>2</sup> (11.7 km<sup>2</sup>) probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1967 to current year.

GAGE.--Water-stage recorder and V-notch weir low-water control. Datum of gage is 116.58 ft (35.534 m) above mean sea level.

REMARKS.--Water-discharge records good. La Gloria Oil Refinery no longer releases waste during low-flow periods.

AVERAGE DISCHARGE.--10 years, 6.20 ft<sup>3</sup>/s (0.176 m<sup>3</sup>/s), 0.18 in/yr (5 mm/yr), 4,490 acre-ft/yr (5.54 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,300 ft<sup>3</sup>/s (150 m<sup>3</sup>/s) Sept. 13, 1971, gage height, 12.66 ft (3.859 m); no flow at times in 1970-77.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1929, 15.0 ft (4.57 m) Sept. 13, 1951, from information by Texas Highway Department.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Gage height (ft)	Gage height (m)
Oct. 7	1200	*179	5.07	5.14	1.567	May 25	1300	120	3.40	4.40	1.341

Minimum discharge, no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.07	2.9	7.7	.07	.07	.01	.00	.00	.04	.00	.00	.00
2	.05	1.6	3.9	.09	.08	.01	.00	.00	.03	.00	.00	.00
3	.05	.63	2.4	.07	.15	.03	.00	.00	.02	.00	.00	.00
4	.03	.26	1.1	.06	.08	.05	.00	.00	.01	.00	.00	.00
5	6.0	.12	.76	.05	.05	.06	.00	.00	.01	.00	.00	.00
6	14	.08	.50	.04	.04	.04	.00	.00	.01	.00	.00	.01
7	136	.04	.32	.03	.04	.03	.00	.00	.00	.00	.00	.00
8	42	.04	.21	.03	.03	.02	.00	.00	.00	.00	.00	.00
9	12	.03	.13	.04	.04	.03	.00	.01	.00	.00	.00	.00
10	4.7	.03	.09	.06	.07	.05	.00	.00	.00	.00	.00	.00
11	2.3	.03	.08	.07	.36	.06	.00	.00	.00	.00	.00	.00
12	.65	.03	.09	.12	.27	.03	.00	.00	.00	.00	.00	.00
13	.32	.06	.24	1.0	.10	.02	.00	.00	.00	.00	.00	.00
14	.16	.05	.53	.41	.08	.01	.00	.00	.00	.00	.00	.00
15	.16	.04	.33	.12	.08	.01	.00	.00	.00	.00	.00	.00
16	1.4	.04	.13	.06	.06	.00	.00	.00	.00	.00	.00	.00
17	.44	1.5	.17	.04	.05	.00	.00	.00	.00	.00	.00	.00
18	.13	9.1	.11	.05	.07	.00	.00	.00	.00	.00	.00	.00
19	.05	21	.15	.04	.07	.00	.00	.00	.00	.00	.00	.00
20	.10	25	.24	.03	.07	.00	.00	.00	.00	.00	.00	.00
21	.05	15	.09	.03	.06	.00	.00	.00	.00	.00	.00	.00
22	.08	7.7	.07	.33	.04	.00	.00	.00	.00	.00	.00	.00
23	.06	3.9	.12	.27	.05	.00	.00	.06	.00	.00	.00	.00
24	.05	2.3	.10	.11	.05	.00	.00	.06	.00	.00	.00	.00
25	.08	1.1	.06	.31	.05	.00	.00	71	.00	.00	.00	.00
26	.07	.65	.07	.20	.03	.00	.00	21	.00	.00	.00	.00
27	6.2	.49	.08	.12	.03	.00	.00	5.6	.00	.00	.00	.00
28	16	17	.07	.08	.03	.00	.00	1.1	.00	.00	.00	.00
29	16	22	.05	.05	---	.00	.00	.40	.00	.00	.00	.00
30	12	14	.05	.04	---	.00	.00	.15	.00	.00	.00	.00
31	6.1	---	.06	.04	---	.00	---	.07	.00	.00	.00	---
TOTAL	277.30	146.72	20.00	4.06	2.20	.46	.00	99.45	.12	.00	.00	.01
MEAN	8.95	4.89	.65	.13	.079	.015	.000	3.21	.004	.000	.000	.000
MAX	136	25	7.7	1.0	.36	.06	.00	71	.04	.00	.00	.01
MIN	.03	.03	.05	.03	.03	.00	.00	.00	.00	.00	.00	.00
CFSM	.02	.01	.001	.000	.000	.000	.000	.007	.000	.000	.000	.000
IN.	.02	.01	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00
AC-FT	550	291	40	8.1	4.4	.9	.00	197	.2	.00	.00	.02
CAL YR 1976	TOTAL	1584.67	MEAN 4.33	MAX 212	MIN .00	CFSM .009	IN .12	AC-FT 3140				
WTR YR 1977	TOTAL	550.32	MEAN 1.51	MAX 136	MIN .00	CFSM .003	IN .04	AC-FT 1090				

## LOS OLMOS CREEK BASIN

08212400 LOS OLMOS CREEK NEAR FALFURRIAS, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1974 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1974 to current year.

WATER TEMPERATURES: October 1974 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 7,380 micromhos July 5, 1976; minimum daily, 69 micromhos July 16, 1975.

WATER TEMPERATURES: Maximum daily, 33.0°C July 29, Aug. 1, 1976, May 30, 1977; minimum daily, 3.0°C Nov. 28, 1977.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,550 micromhos Mar. 15; minimum daily, 106 micromhos Nov. 20.

WATER TEMPERATURES: Maximum daily, 33.0°C May 30; minimum daily, 3.0°C Nov. 28.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)
OCT 19...	1430	.06	808	7.0	21.5	30	5.8	67	4.7	4400	1300	12000
NOV 17...	1015	3.0	1190	7.6	10.0	100	8.6	79	4.2	52000	10000	54000
DEC 14...	1500	1.0	1680	7.5	13.0	40	9.9	97	4.4	4800	1700	6100
JAN 11...	1725	.06	3320	8.1	9.0	6	11.7	104	3.4	290	190	1000
FEB 15...	1530	.05	2630	8.2	16.0	20	11.5	120	5.7	440	84	1700
DATE	HARDNESS (CA, MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED PHOSPHORUS (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 19...	150	90	43	11	92	3.2	16	77	0	170	100	.2
NOV 17...	190	130	49	17	170	5.3	19	81	0	240	180	.5
DEC 14...	280	220	72	24	240	6.3	28	70	0	380	270	.7
JAN 11...	550	490	140	49	500	9.3	46	80	0	860	560	1.4
FEB 15...	430	350	110	37	380	8.0	37	90	0	610	440	1.0
DATE	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT CHARGE (T/DAY)	SUSPENDED SEDIMENT SIEVE DIAM. % FINER THAN .062 MM
OCT 19...	24	466	494	.02	.01	.16	1.4	.87	--	45	.01	74
NOV 17...	22	744	737	.20	.01	.19	1.3	.93	--	115	.93	100
DEC 14...	35	1070	1080	.13	.01	.09	1.4	1.8	--	65	.18	100
JAN 11...	62	2270	2260	--	.00	.01	--	--	--	12	.00	99
FEB 15...	54	1760	1710	.01	.00	.02	1.5	3.2	8.5	34	.00	93

## LOS OLMOS CREEK BASIN

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08212400 LOS OLMOS CREEK NEAR FALFURRIAS, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)		
FEB 15...	1530	20	18	100	0	0	100	10		
DATE		TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)
FEB 15...	2	0	12	10	740	50	7	6	90	
DATE		DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)	
FEB 15...	20	.1	.1	6	3	0	20	10		



08212400 LOS OLMOS CREEK NEAR FALFURRIAS, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO FEBRUARY 1977

DATE TIME	OCT 19,76 1430	NOV 17,76 1015	DEC 14,76 1500	JAN 11,77 1725	FEB 15,77 1530
TOTAL CELLS/ML	5600	8200	12000	19000	12000
DIVERSITY: DIVISION	2.0	1.6	1.6	0.4	0.7
..CLASS	2.3	1.6	1.7	0.4	0.7
..ORDER	2.5	2.3	2.1	0.6	0.8
...FAMILY	2.9	2.6	2.6	1.0	0.9
....GENUS	3.3	3.1	2.9	2.7	0.9

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....OOCYSTACEAE										
.....DICHOTOMOCOCCUS	--	-	--	-	--	-	2000	11	--	-
....MICRACTINIACEAE										
.....MICRACTINIUM	63	1	--	-	1000	9	210	1	--	-
....OOCYSTACEAE										
.....ANKISTRODESMUS	190	3	120	1	340	3	4000#	22	*	0
....CHLORELLA	--	-	--	-	--	-	7200#	39	--	-
....DICTYOSPHAERIUM	280	5	120	1	2000#	18	290	2	--	-
....KIRCHNERIELLA	130	2	*	0	200	2	1300	7	--	-
....OOCYSTIS	--	-	--	-	*	0	210	1	--	-
....TETRAEDRON	--	-	--	-	--	-	*	0	--	-
....TREUBARIA	--	-	--	-	--	-	290	2	--	-
....WESTELLA	--	-	--	-	68	1	--	-	--	-
....SCENEDESMACEAE										
.....ACTINASTRUM	--	-	--	-	--	-	*	0	--	-
....CRUCIGENIA	--	-	1900#	23	--	-	--	-	--	-
....SCENEDESMUS	250	5	650	8	820	7	1000	5	79	1
....TETRASTRUM	--	-	--	-	*	0	290	2	--	-
..VOLVOCELES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	130	2	--	-	1200	11	210	1	180	1
....PHACOTACEAE										
....PTEROMONAS	31	1	88	1	--	-	--	-	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...PENNIALES										
....NAVICULACEAE										
.....FNTOMONEIS	31	1	--	-	--	-	--	-	*	0
..CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	220	4	1100	14	200	2	1400	8	*	0
....MELOSIRA	--	-	350	4	--	-	--	-	--	-
...PENNIALES										
....ACHNANTHACEAE										
.....ACHNANTHES	--	-	--	-	--	-	--	-	*	0
....CYMBELLACEAE										
.....AMPHORA	--	-	--	-	*	0	--	-	--	-
....CYMBELLA	31	1	--	-	--	-	*	0	--	-
....NAVICULACEAE										
.....DIPLONEIS	--	-	*	0	--	-	--	-	--	-
....NAVICULA	160	3	710	9	*	0	*	0	*	0
....NITZSCHIA										
.....DENTICULA	--	-	*	0	--	-	--	-	*	0
....NITZSCHIA	630	11	1000	12	410	4	*	0	1300	11
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCALES										
....CHROCOCCACEAE										
.....ANACYSTIS	--	-	1500#	18	--	-	--	-	--	-
....HORMOGONALES										
.....OSCILLATORIA										
....OSCILLATORIA	1800#	32	440	5	1400	12	*	0	10000#	85
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
....CRYPTOMONODACEAE										
.....CRYPTOMONAS	940#	17	--	-	3900#	33	--	-	--	-
..EUGLENACEAE										
....EUGLENA	350	6	88	1	68	1	--	-	--	-
....PHACUS	190	3	--	-	--	-	*	0	*	0
....TRACHELOMONAS	190	3	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...PERIDINIALES										
....GLENODINIACEAE										
.....GLENODINIUM	--	-	--	-	--	-	*	0	*	0

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM; MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## 08212400 LOS OLMOS CREEK NEAR FALFURRIAS, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	277.3	193	120	93	18	13	26	19	42
NOV. 1976.....	146.72	158	100	40	14	5.6	21	8.3	34
DEC. 1976.....	19	418	270	14	54	2.9	78	4.1	83
JAN. 1977.....	4.06	1860	1210	13	280	3.2	420	4.6	300
FEB. 1977.....	2.2	2460	1590	9.7	390	2.3	570	3.3	400
MAR. 1977.....	0.46	4030	2780	3.4	660	0.8	1010	1.3	700
APR. 1977.....	0	*****	*****	0	*****	0	*****	0	****
MAY 1977.....	99.45	141	91	24	12	3.2	16	4.5	30
JUNE 1977.....	0.12	250	160	0.05	22	360	30	15800	54
JULY 1977.....	0	*****	*****	0	*****	0	*****	0	****
AUG. 1977.....	0	*****	*****	0	*****	0	*****	0	****
SEPT 1977.....	0	4540	3170	0.09	760	0.02	1160	0.03	790
TOTAL .....	550.32	**	**	197	**	31	**	45.1	**
WTD.AVG. ....	1.51	207	130	**	21	**	31	**	45

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1470	260	154	2820	1610	3400		---	220			---
2	1460	223	160	2900	1820	3440		---	240			---
3	1450	190	181	2970	1840	3600		---	263			---
4	1440	265	187	3000	1900	3740		---	275			---
5	547	386	300	3040	1960	3930		---	290			---
6	253	500	487	3060	1990	3980		---	305			4540
7	138	502	407	3110	2080	4020		---	---			---
8	146	571	458	3170	2190	4060		---	---			---
9	196	546	619	3210	2310	4070		4320	---			---
10	200	562	688	3290	2390	4090		---	---			---
11	201	615	777	3350	2350	4230		---	---			---
12	402	651	873	3300	2410	4420		---	---			---
13	431	860	1110	1450	2540	4480		---	---			---
14	446	1000	1750	1320	2730	4530		---	---			---
15	571	1210	1690	1900	2690	4550		---	---			---
16	807	1190	1600	2330	2570	---		---	---			---
17	735	750	1690	2340	2670	---		---	---			---
18	665	479	1750	2380	2740	---		---	---			---
19	831	110	1730	2430	2850	---		---	---			---
20	897	106	1720	2440	2930	---		---	---			---
21	1030	125	1890	2450	2990	---		---	---			---
22	1070	177	1940	1940	3000	---		---	---			---
23	1200	123	1990	1720	3050	---		2510	---			---
24	1390	130	2150	1750	3090	---		2580	---			---
25	1400	133	2300	1590	3180	---		132	---			---
26	1470	124	2280	1190	3270	---		149	---			---
27	550	131	2250	1220	3320	---		155	---			---
28	365	154	2400	1350	3360	---		165	---			---
29	122	110	2520	1470	---	---		175	---			---
30	175	120	2620	1590	---	---		188	---			---
31	263	---	2740	1610	---	---		210	---			---
MEAN	720	410	1400	2310	2570	4040		1060	266			---

LOS OLMOS CREEK BASIN  
08212400 LOS OLMOS CREEK NEAR FALFURRIAS, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23.0	15.0	8.5	---	9.5	16.5		---	32.0			
2	---	15.5	8.0	---	9.0	21.0		---	25.0			
3	---	15.0	3.5	12.0	15.0	---		---	28.0			
4	22.0	13.5	14.0	10.5	18.5	19.0		---	---			
5	20.0	14.5	16.0	---	16.5	12.0		---	25.5			
6	20.0	15.0	17.0	8.5	15.0	18.0		---	26.0			
7	19.0	14.5	14.5	6.5	14.5	16.5		---	---			
8	19.0	14.5	4.5	13.5	12.0	16.0		---	---			
9	19.0	15.0	18.0	13.0	13.0	19.0		---	---			
10	17.0	17.0	13.0	---	15.5	20.5		---	---			
11	18.0	19.0	13.5	9.0	21.0	18.5		---	---			
12	24.0	13.0	10.5	13.0	---	21.5		---	---			
13	19.5	---	11.0	14.5	20.0	16.0		---	---			
14	20.0	---	15.0	13.0	23.0	23.0		---	---			
15	21.0	10.5	8.0	---	13.5	21.0		---	---			
16	20.5	7.0	11.5	9.5	19.0	---		---	---			
17	17.0	9.5	12.0	10.0	20.5	---		---	---			
18	16.5	10.0	13.5	11.0	21.5	---		---	---			
19	20.0	---	14.0	11.0	---	---		---	---			
20	14.5	18.0	14.0	11.5	15.0	---		---	---			
21	14.5	16.5	8.0	14.5	23.5	---		---	---			
22	18.5	13.0	8.0	14.0	23.0	---		---	---			
23	21.5	14.0	10.0	16.0	22.0	---		29.0	---			
24	19.5	14.5	12.0	15.5	13.5	---		30.0	---			
25	20.5	15.0	8.5	16.0	21.5	---		30.5	---			
26	17.0	16.5	12.0	19.5	18.0	---		29.0	---			
27	15.0	19.0	8.0	23.5	15.5	---		---	---			
28	14.5	3.0	10.0	---	19.0	---		---	---			
29	13.0	4.0	10.5	11.5	---	---		26.5	---			
30	---	5.5	13.5	11.0	---	---		33.0	---			
31	14.5	---	---	9.0	---	---		---	---			
MEAN	18.5	13.0	11.5	12.5	17.0	18.5		29.5	27.5			

## RIO GRANDE BASIN

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08364000 RIO GRANDE AT EL PASO, TX

LOCATION.--Lat 31°48'10", long 106°32'25", El Paso County, Hydrologic Unit 13030102, at gaging station on the downstream side of the Courchesne Bridge, 5.6 mi (9.0 km) upstream from the Santa Fe Street-Juarez Avenue bridge between El Paso, Tex., and Cd. Juarez, Mex., and 1.7 mi (2.7 km) upstream from the American Dam.

DRAINAGE AREA.--29,267 mi<sup>2</sup> (75,802 km<sup>2</sup>).

PERIOD OF RECORD.--Chemical analyses: February 1930 to current year.

REMARKS.--Records of specific conductance and discharge for water year 1977 are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- CHARGE (CFS)	SPF- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	
OCT											
01-31	--	233	2060	8.2	--	430	190	120	31	290	
NOV											
01-30	--	176	2160	8.1	--	430	210	120	32	300	
DEC											
01-31	--	163	2260	8.0	--	460	210	130	32	340	
JAN											
01-31	--	124	2320	8.2	--	400	190	110	31	370	
FEB											
01-28	--	80	2660	7.9	--	420	180	110	34	430	
MAR											
01-31	--	502	1100	8.3	--	270	96	81	16	140	
APR											
01-30	--	381	1320	7.9	--	300	110	87	19	180	
MAY											
01-31	--	304	1460	8.2	--	320	120	94	20	190	
JUN											
21...	1030	680	1010	7.9	26.0	260	84	78	15	110	
JUL											
21...	1045	535	1190	7.7	26.0	270	92	81	17	150	
AUG											
22...	1000	596	1120	7.5	22.0	260	83	76	16	130	
SEP											
22...	0810	115	2140	7.7	22.0	420	190	120	30	310	
DATE		SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)
OCT											
01-31	6.1	--	288	0	490	240	26	--	1340	.21	
NOV											
01-30	6.3	--	268	0	500	270	27	--	1380	.24	
DEC											
01-31	6.9	--	304	0	530	270	28	--	1480	.25	
JAN											
01-31	8.0	--	260	0	560	290	25	--	1520	.04	
FEB											
01-28	9.2	--	290	0	620	360	27	--	1720	.01	
MAR											
01-31	3.7	--	210	0	240	110	9.9	--	701	.20	
APR											
01-30	4.6	--	230	0	260	150	10	--	820	.09	
MAY											
01-31	4.6	--	240	0	300	160	13	--	896	.13	
JUN											
21...	3.0	--	210	0	200	82	11	620	600	.08	
JUL											
21...	4.0	--	220	0	260	110	13	741	740	.01	
AUG											
22...	3.5	--	210	0	230	100	16	693	672	.02	
SEP											
22...	6.6	13	290	0	510	250	29	--	1410	--	

## RIO GRANDE BASIN

08365600 MCKELLIGON CANYON AT EL PASO, TX

LOCATION.--Lat 31°49'17", Long 106°28'03", El Paso County, Hydrologic Unit 13040100, on left bank 120 ft (37 m) south of McKelligon Canyon Drive, 0.1 mi (0.2 km) west of Alabama Avenue, 0.5 mi (0.8 km) south of crest of Sugarload Mountain, and 4.4 mi (7.1 km) north of El Paso County Courthouse.

DRAINAGE AREA.--2.3 mi<sup>2</sup> (6.0 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--October 1957 to September 1977 (discontinued).

GAGE.--Water-stage recorder and small earthfill dam with uncontrolled concrete outlet tower. Datum of gage is 4,257.33 ft (1,297.63 m) above mean sea level (levels by city of El Paso).

REMARKS.--No flow since July 18, 1973. Floodflow controlled by four small reservoirs upstream with a capacity of about 95 acre-ft (117,000 m<sup>3</sup>).

AVERAGE DISCHARGE.--20 years, 0.010 ft<sup>3</sup>/s (0.0003 m<sup>3</sup>/s), 7.24 acre-ft/yr (8,930 m<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 306 ft<sup>3</sup>/s (8.67 m<sup>3</sup>/s) July 14, 1973, gage height 5.66 ft (1.725 m); no flow except Sept. 11, 12, 1958, July 14-18, 1973.

EXTREMES FOR CURRENT YEAR.-- No flow during year.

## 08365800 GOVERNMENT DITCH AT EL PASO, TX

LOCATION.--Lat 31°47'02", long 106°26'41", El Paso County, Hydrologic Unit 13040100, at intersection of Montana and Houston Streets and 2 mi (3 km) northeast of the business center of El Paso.

DRAINAGE AREA.--6.4 mi<sup>2</sup> (16.6 km<sup>2</sup>), approximately.

PERIOD OF RECORD.--June 1958 to September 1977 (discontinued).

REVISED RECORDS.--WSP 1923: 1958-60.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,740 ft (1,140 m), from topographic map.

REMARKS.--Records good.

AVERAGE DISCHARGE.--19 years (water years 1959-77), 0.22 ft<sup>3</sup>/s (0.0062 m<sup>3</sup>/s), 0.47 in/yr (12 mm/yr), 159 acre-ft/yr (196,000 m<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 550 ft<sup>3</sup>/s (15.6 m<sup>3</sup>/s) Sept. 11, 1958, gage height, 2.64 ft (0.805 m), from rating curve extended above 148 ft<sup>3</sup>/s (4.19 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; no flow most of time each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 70 ft<sup>3</sup>/s (1.98 m<sup>3</sup>/s) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)
July 24	2230	157 4.45	1.06 0.323	Aug. 21	2115	*392 11.1	2.05 0.625

Minimum discharge, no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	.00	.00	.00	.00	.00	.00	.00	.00	.87	.64	.05
2	1.5	.00	.00	.01	.00	.00	.00	.00	.00	.00	.14	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.50	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.10	.02	.03	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.06	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00
9	.00	.00	.00	.37	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.53	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.2
12	.00	.20	.30	.00	.00	.00	.00	.00	.00	.00	.00	.27
13	.00	1.7	.03	.00	.00	.00	.00	.00	.00	.35	.00	.00
14	.93	.15	.00	.00	.00	.02	.02	.00	.00	.07	.14	.00
15	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.06	.00	.00	.00	.00	.00	.00
17	.00	.00	.60	.00	.00	.02	.00	.00	.00	.00	.00	.00
18	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00
20	.00	.00	1.1	.00	.00	.00	.00	.00	.00	.00	.06	.00
21	.00	.00	.00	2.1	.00	.00	.00	.00	.00	.00	16	.00
22	.00	.00	.00	.48	.00	.00	.00	.00	.00	2.0	1.6	.00
23	.00	.00	.00	.78	.00	.00	.00	.00	.00	.30	.00	.00
24	.02	.00	.00	.00	.00	.00	.00	.00	.00	6.6	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.7	13	.00
26	.00	.00	.00	.00	.00	6.1	.00	.00	.00	.00	9.8	.00
27	.00	.23	.00	.00	.00	.04	.00	.00	.00	.00	1.7	.00
28	1.9	4.4	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00
29	.25	.05	.00	.00	---	.00	.00	.00	1.4	.00	.00	.00
30	.00	.00	.00	.09	---	.00	.00	.00	.23	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.02	.10	---
TOTAL	5.80	6.75	2.04	3.83	.00	6.24	.02	.10	2.15	14.05	43.75	1.52
MEAN	.19	.23	.066	.12	.000	.20	.001	.003	.072	.45	1.41	.051
MAX	1.9	4.4	1.1	2.1	.00	6.1	.02	.10	1.4	6.6	16	1.2
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
CFSM	.03	.04	.01	.02	.000	.03	.000	.000	.01	.07	.22	.008
IN.	.03	.04	.01	.02	.00	.04	.00	.00	.01	.08	.25	.01
AC-FT	12	13	4.0	7.6	.00	12	.04	.2	4.3	28	87	3.0
CAL YR 1976	TOTAL	114.37	MEAN .31	MAX 35	MIN .00	CFSM .05	IN .66	AC-FT 227				
WTR YR 1977	TOTAL	86.25	MEAN .24	MAX 16	MIN .00	CFSM .04	IN .50	AC-FT 171				



08370500 RIO GRANDE BELOW OLD FORT QUITMAN, TX  
(National stream-quality accounting network)

LOCATION.--Lat 31°05'05", long 105°36'25", Hudspeth County, Hydrologic Unit 13040201, at gaging station on the rectified channel of the Rio Grande, 1.5 mi (2.4 km) downstream from Old Fort Quitman, and 81.1 mi (130.5 km) downstream from the American Dam at El Paso.

DRAINAGE AREA (revised).--31,944 mi<sup>2</sup> (82,735 km<sup>2</sup>), United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

PERIOD OF RECORD.--Chemical analyses: February 1930 to current year. Chemical and biochemical analyses: October 1974 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1974 to current year.

WATER TEMPERATURES: October 1974 to current year.

REMARKS.--Records of discharge for water year 1977 are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 13,000 micromhos May 18, 1977; minimum daily, 1,500 micromhos July 15, 1976.

WATER TEMPERATURES: Maximum daily, 35.0°C Aug. 10, 1976; minimum daily, 1.5°C Dec. 1, 1976.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 13,000 micromhos May 18; minimum daily, 3,150 micromhos Dec. 5.

WATER TEMPERATURES: Minimum daily, 1.5°C Dec. 1.

# WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- CHARGE (CFS)	SPECIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	RIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)
OCT										
01-31	--	145	4450	8.3	--	--	--	--	--	--
25...	0945	159	4210	7.9	13.5	55	9.3	93	7.8	34000
NOV										
01-30	--	190	3860	7.9	--	--	--	--	--	--
22...	0830	197	3840	7.8	9.0	40	8.3	75	21	76000
DEC										
01-31	--	175	3800	8.3	--	--	--	--	--	--
13...	0845	179	4020	7.9	7.5	60	9.5	83	20	52000
JAN										
18...	0845	41	4480	8.0	4.5	18	10.0	81	9.0	34000
FEB										
21...	0945	22	8790	7.8	10.0	3	10.9	103	2.3	920
MAR										
22...	0830	12	9020	7.8	10.0	5	--	--	3.1	1200
APR										
19...	1000	11	9560	8.0	19.5	20	11.2	129	8.1	7200
MAY										
24...	0745	6.4	9670	7.8	18.0	25	7.2	81	6.1	30000
JUN										
20...	0600	.50	10800	7.8	20.5	10	5.6	67	13	86000

DATE	FECAL COLI- FORM .7UM-MF (COL./ 100 ML)	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)
OCT									
01-31	--	--	890	610	260	58	650	9.5	--
25...	210	640	880	600	250	62	640	9.4	140
NOV									
01-30	--	--	780	530	230	51	600	9.3	--
22...	1800	2700	770	470	220	53	600	9.4	16
DEC									
01-31	--	--	750	500	220	49	580	9.2	--
13...	4900	22000	--	--	--	--	--	--	--
JAN									
18...	48	680	840	560	240	59	680	10	16
FEB									
21...	19	140	1600	1300	420	140	1500	16	17
MAR									
22...	23	130	--	--	--	--	--	--	--
APR									
19...	110	400	1800	1800	480	150	1700	17	21
MAY									
24...	120	100	1700	1500	460	140	1600	17	19
JUN									
20...	620	1800	1800	1700	460	170	2000	20	19

## RIO GRANDE BASIN

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08370500 RIO GRANDE BELOW OLD FORT QUITMAN, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	RICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)
OCT									
01-31	340	0	770	860	--	29	--	2810	--
25...	344	0	790	830	.9	27	2850	2910	1.7
NOV									
01-30	316	0	670	760	--	29	--	2520	--
22...	360	0	750	700	.8	28	2540	2550	.63
DEC									
01-31	308	0	650	710	--	29	--	2420	--
13...	--	--	--	--	--	--	--	--	.58
JAN									
18...	348	0	800	920	.7	28	2960	2920	.56
FEB									
21...	352	0	1500	2200	.8	25	5940	5980	.00
MAR									
22...	--	--	--	--	--	--	--	--	.00
APR									
19...	8	0	1500	2400	.7	25	6510	6280	.00
MAY									
24...	330	0	1600	2300	.9	22	6630	6300	.00
JUN									
20...	170	0	1800	2800	.8	11	7370	7350	.00
DATE	TOTAL NITRITE (N) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUS- PENDE SEDIM- ENT (MG/L)	SUS- PENDE SEDIM- ENT DIS- CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT									
01-31	--	2.6	--	--	--	--	--	--	--
25...	.19	--	.59	1.8	1.2	3.0	516	222	40
NOV									
01-30	--	5.3	--	--	--	--	--	--	--
22...	.12	--	3.6	5.4	2.0	--	236	126	31
DEC									
01-31	--	5.9	--	--	--	--	--	--	--
13...	.09	--	3.4	1.3	1.5	--	343	166	35
JAN									
18...	.11	--	4.0	3.3	1.4	--	38	4.2	72
FEB									
21...	.01	--	.06	.75	.08	2.2	81	4.8	14
MAR									
22...	.00	--	.10	.84	.09	--	72	2.3	43
APR									
19...	.01	--	.03	1.8	.18	--	115	3.4	57
MAY									
24...	.02	--	.00	1.3	.16	--	103	1.8	68
JUN									
20...	.01	--	.07	1.9	.14	15	40	.05	90

## RIO GRANDE BASIN

08370500 RIO GRANDE BELOW OLD FORT QUITMAN, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED BORON (B) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	
DATE	TIME									
OCT										
01-31	--	--	--	--	510	--	--	--	--	
25...	0945	9	6	100	--	0	0	10	0	
NOV										
01-30	--	--	--	--	450	--	--	--	--	
DEC										
01-31	--	--	--	--	440	--	--	--	--	
FEB										
21...	0945	4	3	0	--	0	0	30	0	
JUN										
20...	0600	8	4	300	--	20	0	10	10	
		TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)
DATE										
OCT										
01-31	--	--	--	--	--	--	--	--	--	--
25...	1	0	7	2	1200	0	4	0	160	
NOV										
01-30	--	--	--	--	--	--	--	--	--	--
DEC										
01-31	--	--	--	--	--	--	--	--	--	--
FEB										
21...	0	0	4	2	210	20	0	0	900	
JUN										
20...	50	0	<10	1	70	50	100	1	380	
		DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)	
DATE										
OCT										
01-31	--	--	--	--	--	--	--	--	--	
25...	40	.0	.0	0	0	0	30	10		
NOV										
01-30	--	--	--	--	--	--	--	--	--	
DEC										
01-31	--	--	--	--	--	--	--	--	--	
FEB										
21...	800	.0	.0	--	0	0	10	10		
JUN										
20...	310	.0	.0	1	0	0	20	20		

RIO GRANDE BASIN

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08370500 RIO GRANDE BELOW OLD FORT QUITMAN, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- AZINON (UG/L)
OCT 25...	0945	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
JAN 18...	0845	ND	--	ND	--	ND	--	ND	--	ND	--	ND
MAY 24...	0745	ND	--	ND	--	ND	--	ND	--	ND	--	ND

DATE	DI- AZINON IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	ETHION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
OCT 25...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
JAN 18...	--	ND	--	ND	--	ND	--	ND	--	ND	--
MAY 24...	--	ND	--	ND	--	ND	--	ND	--	ND	--

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	MALA- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL METHOXY- CHLOR (UG/L)	METHOXY- CHLOR IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL METHYL PARA-THION (UG/L)	METHYL PARA-THION IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL METHYL TRI-THION (UG/L)	METHYL TRI-THION IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL PARA- THION (UG/L)
OCT 25...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
JAN 18...	ND	--	ND	--	ND	--	ND	--	ND	--	ND
MAY 24...	ND	--	ND	--	ND	--	ND	--	ND	--	ND

DATE	PARA- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TRI- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ATRA- ZINE (UG/L)	SIMA- ZINE TOTAL COUL- SON (UG/L)	SIMA- ZINE IN BOTTOM MATERI- AL (UG/ KG DRY SOLIDS)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 25...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
JAN 18...	--	ND	--	ND	--	ND	ND	--	ND	ND	ND
MAY 24...	--	ND	--	ND	--	ND	ND	--	ND	ND	ND

## RIO GRANDE BASIN

08370500 RIO GRANDE BELOW OLD FORT QUITMAN, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO JUNE 1977

DATE TIME	OCT 25,76 0945	NOV 22,76 0830	DEC 13,76 0845	JAN 18,77 0845
TOTAL CELLS/ML	0	24000	10000	7300
DIVERSITY: DIVISION	0.0	1.2	1.2	1.4
..CLASS	0.0	1.2	1.2	1.4
..ORDER	0.0	1.7	1.8	1.8
...FAMILY	0.0	2.2	2.1	2.3
....GENUS	0.0	2.3	2.2	2.3

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)								
..CHLOROPHYCEAE								
...CHLOROCOCCALES								
....MICRACTINIACEAE								
.....MICRACTINIUM	--	-	12000#	49	--	-	--	-
....OOCYSTACEAE								
.....ANKISTRODESMUS	--	-	350	1	150	1	180	2
.....CHODATELLA	--	-	--	-	--	-	--	-
.....OOCYSTIS	--	-	--	-	--	-	--	-
...SCENEDESMACEAE								
....ACTINASTRUM	--	-	--	-	--	-	--	-
....CRUCIGENIA	--	-	--	-	--	-	--	-
....SCENEDESMUS	--	-	*	0	--	-	230	3
....TETRASTRUM	--	-	920	4	300	3	--	-
..VOLVOCALES								
...CHLAMYDOMONADACEAE	--	-	--	-	--	-	--	-
....CARTERIA	--	-	--	-	--	-	--	-
....CHLAMYDOMONAS	--	-	580	2	150	1	530	7
...PHACOTACEAE								
....PHACOTUS	--	-	*	0	--	-	--	-
CHRYSOPHYTA								
..BACILLARIOPHYCEAE								
...PENNALES								
....NAVICULACEAE								
.....ENTOMONEIS	--	-	230	1	150	1	--	-
...CENTRALES								
....CHAETOCERACEAE								
.....CHAETOCEROS	--	-	--	-	--	-	--	-
....COSCINODISCACEAE								
.....CYCLOTELLA	--	-	2400	10	1300	13	590	8
.....STEPHANODISCUS	--	-	--	-	--	-	--	-
....RHIZOSOLENIA								
.....RHIZOSOLENIA	--	-	--	-	--	-	--	-
...PENNALES								
....CYMBELLACEAE								
.....CYMBELLA	--	-	--	-	--	-	--	-
....FRAGILARIACEAE								
.....SYNEDRA	--	-	230	1	--	-	--	-
...GOMPHONEMACEAE								
....GOMPHONEMA	--	-	--	-	--	-	--	-
....NAVICULACEAE								
.....CALONEIS	--	-	--	-	74	1	--	-
....NAVICULA	--	-	350	1	300	3	880	12
....PINNULARIA	--	-	*	0	--	-	--	-
...NITZSCHIA								
....NITZSCHIA	--	-	--	-	--	-	--	-
....HANTZSCHIA	--	-	*	0	--	-	--	-
....NITZSCHIA	--	-	5900#	25	5500#	54	1400#	19
....SURIPELLA	--	-	--	-	150	1	59	1
..CHRYSOPHYCEAE								
...CHRYSOMONADALES								
....CHROMULINACEAE								
.....CHRYSOCOCCUS	--	-	--	-	--	-	--	-
...XANTHOPHYCEAE								
....HETEROCOCCALES								
.....CENTRITRACTACEAE								
.....CENTRITRACTUS	--	-	--	-	--	-	--	-
..BACILLARIOPHYCEAE								
...PENNALES								
....NAVICULACEAE								
.....PLAGIOTROPIS	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM; MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## RIO GRANDE BASIN

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08370500 RIO GRANDE BELOW OLD FORT QUITMAN, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO JUNE 1977

DATE TIME	OCT 25,76 0945		NOV 22,76 0830		DEC 13,76 0845		JAN 18,77 0845	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)								
..CYANOPHYCEAE								
...HORMOGONALES								
...NOSTOCACEAE								
....ANABAENOPSIS	--	-	* 0		--	-	--	-
...OSCILLATORIACEAE								
....LYNGBYA	--	-	--	-	--	-	--	-
....OSCILLATORIA	--	-	--	-	1600#	16	--	-
...RIVULARIACEAE								
....RAPHIDIOPSIS	--	-	350	1	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)								
..CRYPTOPHYCEAE								
...CRYPTOMONIDALES								
...CRYPTOMONODACEAE								
....CRYPTOMONAS	--	-	* 0		--	-	--	-
..EUGLENOPHYCEAE								
...EUGLENALES								
....EUGLENACEAE								
....EUGLENA	--	-	350	1	370	4	3400#	47
....TRACHELOMONAS	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)								
..DINOPHYCEAE								
...PERIDINIALES								
....PERIDINIACEAE								
....PERIDINIUM	--	-	--	-	74	1	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%  
 \* - OBSERVED ORGANISM; MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%



08370500 RIO GRANDE BELOW OLD FORT QUITMAN, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO JUNE 1977

DATE TIME	FEB 21,77 0945	APR 19,77 1000	MAY 24,77 0745	JUN 20,77 0600
TOTAL CELLS/ML	7800	150000	87000	14000
DIVERSITY: DIVISION	0.7	0.9	0.4	1.3
..CLASS	1.5	0.9	0.4	1.3
...ORDER	2.2	1.1	0.9	1.5
...FAMILY	2.6	1.3	2.1	1.5
....GENUS	2.8	1.3	0.0	1.7

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)								
..CHLOROPHYCEAE								
...CHLOROCOCCALES								
...MICRACTINIACEAE								
...MICRACTINIUM	--	-	--	-	--	-	--	-
...OOCYSTACEAE								
....ANKISTRODESMUS	--	-	1300	1	2100	2	960	7
....CHODATELLA	--	-	*	0	--	-	--	-
....OOCYSTIS	--	-	--	-	--	-	380	3
...SCENEDESMACEAE								
....ACTINASTRUM	*	0	--	-	--	-	--	-
....CRUCIGENIA	420	5	--	-	--	-	--	-
....SCENEDESMUS	--	-	--	-	*	0	--	-
....TETRASTRUM	--	-	--	-	--	-	--	-
..VOLVOCALES								
...CHLAMYDOMONADACEAE	--	-	--	-	1400	2	--	-
....CARTERIA	--	-	--	-	*	0	--	-
....CHLAMYDOMONAS	420	5	*	0	1400	2	--	-
...PHACOTACEAE								
....PHACOTUS	--	-	--	-	--	-	--	-
CHRYSTOPHYTA								
..BACILLARIOPHYCEAE								
...PENNALES								
...NAVICULACEAE								
....ENTOMONEIS	210	3	--	-	1400	2	--	-
...CENTRALES								
...CHAETOCERACEAE								
...CHAETOCEROS	--	-	--	-	20000#	22	--	-
...COSCINODISCAEAE								
...CYCLOTELLA	2000#	26	100000#	71	47000#	54	290	2
...STEPHANODISCUS	--	-	--	-	--	-	8300#	61
...RHIZOSOLENIAEAE								
...RHIZOSOLENIA	--	-	3000	2	6300	7	--	-
...PENNALES								
...CYMBELLACEAE								
...CYMBELLA	*	0	--	-	700	1	--	-
...FRAGILARIACEAE								
...SYNEDRA	210	3	*	0	700	1	480	4
...GOMPHONEMATAEAE								
...GOMPHONEMA	53	1	--	-	--	-	--	-
...NAVICULACEAE								
....CALONEIS	110	1	*	0	*	0	--	-
....NAVICULA	370	5	*	0	2800	3	--	-
....PINNULARIA	--	-	--	-	--	-	--	-
...NITZSCHIAEAE								
...CYLINDROTHECA	110	1	--	-	--	-	--	-
...HANTZSCHIA	--	-	--	-	--	-	--	-
...NITZSCHIA	1200#	16	4900	3	2800	3	--	-
...SURIPELLACEAE								
...SURIPELLA	--	-	--	-	--	-	--	-
..CHRYSTOPHYCEAE								
...CHRYSOMONADALES								
...CHROMULINACEAE								
....CHRYSOCOCCUS	2400#	31	--	-	--	-	--	-
...XANTHOPHYCEAE								
...HETEROCOCCALES								
...CENTRITRACTACEAE								
...CENTRITRACTUS	--	-	*	0	--	-	--	-
..BACILLARIOPHYCEAE								
...PENNALES								
...NAVICULACEAE								
....PLAGIOTROPIS	--	-	--	-	*	0	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

RIO GRANDE BASIN

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08370500 RIO GRANDE BELOW OLD FORT QUITMAN, TX.--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO JUNE 1977

DATE TIME	FEB 21,77 0945		APR 19,77 1000		MAY 24,77 0745		JUN 20,77 0600	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)								
..CYANOPHYCEAE								
...HORMOGONALES								
...NOSTOCACEAE								
....ANABAENOPSIS	--	-	--	-	*	0	2900#	21
...OSCILLATORIAEAE								
....LYNGBYA	--	-	30000#	21	700	1	--	-
....OSCILLATORIA	--	-	--	-	700	1	--	-
...RIVULARIACEAE								
....RAPHIDIOPSIS	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)								
..CRYPTOPHYCEAE								
...CRYPTOMONIDALES								
....CRYPTOMONODACEAE								
....CRYPTOMONAS	--	-	--	-	--	-	--	-
..EUGLENOPHYCEAE								
...EUGLENALES								
....EUGLENACEAE								
....EUGLENA	260	3	*	0	*	0	--	-
....TRACHELOMONAS	--	-	--	-	--	-	290	2
PYRRHOPHYTA (FIRE ALGAE)								
..DINOPHYCEAE								
...PERIDINIALES								
....PERIDINIACEAE								
....PERIDINIUM	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%  
\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA.MG) (MG/L)
OCT. 1976.....	4494	4370	2870	34800	880	10700	750	9040	830
NOV. 1976.....	5713	3800	2490	38400	740	11500	650	9990	740
DEC. 1976.....	5417	3760	2470	36100	730	10700	640	9360	730
JAN. 1977.....	1901	4450	2920	15000	900	4610	760	3890	850
FEB. 1977.....	730	8020	5320	10500	1920	3770	1350	2670	1450
MAR. 1977.....	458.6	9020	6040	7480	2220	2750	1510	1860	1620
APR. 1977.....	294.5	9130	6120	4860	2250	1790	1520	1210	1640
MAY 1977.....	262.3	10200	6860	4860	2560	1810	1670	1190	****
JUNE 1977.....	60.7	10300	6950	1140	2600	425	1690	277	****
JULY 1977.....	7.2	9250	6200	120	2280	44	1540	30	1660
AUG. 1977.....	8.5	7720	5110	117	1830	42	1310	30	1400
SEPT 1977.....	0	*****	*****	0	*****	0	*****	0	****
TOTAL .....	19346.78	**	**	153000	**	48100	**	39500	**
WTD.AVG. ....	53	4460	2900	**	920	**	760	**	850

## RIO GRANDE BASIN

08370500 RIO GRANDE BELOW OLD FORT QUITMAN, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6280	3520	3330	3980	6300	9190	8520	9330	10400	---	---	
2	5440	3560	3600	3900	7450	9210	8710	10400	10000	---	---	
3	5150	3930	3650	3960	6670	9230	9220	9670	9330	---	---	
4	3990	4320	3560	4090	7470	9200	9290	10900	9900	---	---	
5	4120	4000	3150	4320	7670	9180	9350	9450	10600	---	---	
6	4400	4130	3270	4340	7650	9200	9100	9900	10400	---	---	
7	4240	3890	3390	4400	7610	9120	8670	10100	10800	---	---	
8	4670	3930	4250	4340	7430	9200	8450	10400	10300	---	---	
9	4890	3940	4220	4260	7450	8200	8740	10500	9770	---	---	
10	4330	3990	4190	4280	7560	8540	8980	10400	9630	---	---	
11	4070	4040	3620	4070	7910	8910	8870	9540	10300	---	---	
12	4520	4200	3370	4460	8010	8730	8780	8970	10900	---	---	
13	4670	4150	3890	4490	7770	9650	9020	10000	10800	---	---	
14	4360	3910	3500	5220	7920	10600	8710	10800	10500	---	---	
15	4570	3610	3870	5020	8170	8960	8940	9450	11000	---	---	
16	4610	3550	3780	4510	7770	8880	9060	9900	10700	---	---	
17	4610	3440	3720	4480	8240	8960	8940	10000	10300	---	---	
18	4280	3240	3880	4420	8470	9040	8630	13000	10400	---	---	
19	4420	3440	3670	4570	8790	7460	9480	11700	10500	---	7720	
20	4330	3470	3850	4810	8540	9070	9500	10400	10800	---	---	
21	4330	3520	4020	5250	8790	8990	9530	9960	10900	---	---	
22	4450	3810	3980	5530	9070	9070	9670	9810	10300	9570	---	
23	4350	3980	3930	4590	9320	9240	9270	10100	10400	9040	---	
24	4240	3900	4000	4300	9250	9150	9900	9670	10700	---	---	
25	4220	3780	4050	4280	9240	9030	9710	9720	11000	---	---	
26	4560	3950	3980	4670	9230	8920	9900	9810	10800	---	---	
27	4740	3910	3890	4490	9160	9150	10000	10200	10900	---	---	
28	4420	3940	3950	4420	9070	8610	8740	10500	10500	---	---	
29	4110	3810	4060	5660	---	8680	8730	10400	10700	---	---	
30	3750	3780	3830	5700	---	8760	8710	10800	10800	---	---	
31	3480	---	4050	5980	---	8300	---	10100	---	---	---	
MEAN	4470	3820	3790	4610	8140	8990	9100	10200	10500	---	---	

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.0	14.5	1.5	10.5	13.0	13.0	22.0	28.0	32.0			
2	23.5	15.0	5.5	11.0	12.0	14.0	21.0	23.0	20.5			
3	23.5	15.5	5.0	10.5	13.0	13.5	10.0	23.0	28.0			
4	18.5	13.0	7.0	11.0	13.5	16.0	19.0	28.0	25.0			
5	20.0	15.0	8.5	8.5	14.0	9.0	19.5	25.0	28.0			
6	22.0	13.0	10.0	8.0	7.0	9.0	21.0	27.0	30.0			
7	14.5	14.5	8.5	8.5	7.0	7.0	19.0	31.0	28.0			
8	11.5	14.5	8.5	7.0	13.5	8.0	13.5	23.5	26.0			
9	13.0	15.0	9.5	6.0	14.0	16.0	23.0	31.0	33.5			
10	20.0	12.0	10.0	6.5	16.0	15.0	26.0	27.5	30.0			
11	18.5	13.0	7.0	5.5	14.5	15.0	26.5	23.5	31.0			
12	16.0	8.0	7.0	5.5	14.0	14.5	26.5	24.0	31.0			
13	16.5	5.5	8.0	5.5	14.0	17.0	23.0	24.0	---			
14	19.0	6.0	9.0	8.0	13.0	18.0	16.0	27.0	---			
15	19.0	5.5	8.0	8.0	15.0	17.0	26.0	27.0	---			
16	18.0	7.0	8.0	8.0	12.0	11.0	23.0	31.0	---			
17	18.0	7.0	8.0	8.0	15.0	19.5	23.0	30.0	---			
18	19.0	11.0	10.0	9.5	13.0	19.5	23.0	26.5	---			
19	16.5	11.0	8.0	10.0	13.0	22.0	21.5	27.0	34.0			
20	16.0	12.0	9.5	10.0	17.0	18.0	19.0	27.0	---			
21	13.0	11.5	6.5	9.0	16.5	18.5	19.0	25.0	---			
22	14.5	10.5	8.0	8.5	13.0	18.0	26.5	25.0	---			
23	16.0	13.0	8.0	10.5	14.0	20.0	22.0	21.0	---			
24	16.5	11.0	5.0	9.0	17.0	15.0	22.0	27.0	---			
25	14.5	11.5	5.0	9.0	13.5	15.5	26.5	26.0	---			
26	14.0	8.5	8.0	13.0	11.0	13.0	22.0	25.5	---			
27	12.0	10.5	8.0	11.0	11.0	14.0	26.0	27.0	---			
28	14.5	7.0	6.5	9.0	15.0	21.0	28.0	17.5	---			
29	9.0	5.0	9.0	10.0	---	16.5	28.5	32.5	---			
30	9.0	5.0	9.5	10.0	---	23.5	19.0	25.0	---			
31	14.0	---	8.5	11.5	---	23.0	---	21.5	---			
MEAN	16.5	10.5	7.5	9.0	13.5	16.0	22.0	26.0	29.0			

08371500 RIO GRANDE ABOVE RIO CONCHO NEAR PRESIDIO, TX

LOCATION.--Lat 29°37'15", long 104°28'50", Presidio County, Hydrologic Unit 13040201, at gaging station 7.8 mi (12.6 km) upstream from the junction of Rio Conchos, about 10 mi (16 km) northwest of Presidio, Tex., and Ojinaga, Chihuahua, Mex., and 285.7 mi (459.7 km) downstream from the American Dam at El Paso.

DRAINAGE AREA, 34,966 mi<sup>2</sup> (90,562 km<sup>2</sup>), revised, United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

PERIOD OF RECORD.--Chemical analyses: February 1935 to current year. Prior to 1964, published as "Rio Grande at Upper Presidio".

REMARKS.--Records of specific conductance and discharge for water year 1977 are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	
OCT 01-31	--	136	3460	8.2	--	590	420	170	41	550	
NOV 01-30	--	135	3780	8.0	--	680	480	190	49	620	
DEC 01-31	--	157	3870	8.3	--	730	500	210	50	600	
JAN 01-31	--	115	4280	7.8	--	750	530	210	55	690	
FEB 01-28	--	71	4600	8.2	--	800	590	220	61	730	
MAR 01-31	--	26	3820	7.8	--	680	480	190	51	590	
APR 01-30	--	11	1910	7.9	--	410	240	120	27	250	
MAY 01-31	--	31	1140	8.2	--	300	140	96	14	150	
JUN 27...	1030	31	1140	7.8	27.0	300	150	100	13	130	
JUL 25...	0945	892	1080	8.0	25.5	280	130	91	12	120	
AUG 18...	1510	29	1050	7.7	--	230	100	73	11	130	
SEP 12...	1145	38	1380	7.3	25.0	370	230	120	17	160	
DATE		SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUF AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)
OCT 01-31	9.8	--	208	0	--	640	--	--	--	--	--
NOV 01-30	10	--	244	0	--	760	--	--	--	--	--
DEC 01-31	9.7	--	276	0	--	760	--	--	--	--	--
JAN 01-31	11	--	270	0	--	820	--	--	--	--	--
FEB 01-28	11	--	260	0	--	930	--	--	--	--	--
MAR 01-31	9.8	--	250	0	730	740	22	--	2450	.25	
APR 01-30	5.4	--	210	0	--	240	--	--	--	--	--
MAY 01-31	3.8	--	190	--	.0	51	--	--	--	--	--
JUN 27...	3.2	--	190	0	--	57	--	772	--	--	--
JUL 25...	3.1	--	180	0	--	52	--	727	--	--	--
AUG 18...	3.8	--	150	0	--	47	--	698	--	--	--
SEP 12...	3.6	7.5	170	0	470	85	27	--	970	--	--

## RIO GRANDE BASIN

08373200 CIBOLO CREEK NEAR PRESIDIO, TX

LOCATION.--Lat 29°34'50", long 104°21'55", Presidio County, Hydrologic Unit 13040201, on left bank at downstream side of bridge on U.S. Highway 67, 1.5 mi (2.4 km) north of Presidio, and 2.5 mi (4.0 km) upstream from mouth.

DRAINAGE AREA.--276 mi<sup>2</sup> (715 km<sup>2</sup>).

PERIOD OF RECORD.--August 1971 to September 1977 (discontinued).

REVISED RECORDS.--WDR TX-75-3: 1972-73.

GAGE.--Water-stage recorder. Datum of gage is 2,645.87 ft (806.461 m) above mean sea level.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--6 years, 8.16 ft<sup>3</sup>/s (0.231 m<sup>3</sup>/s), 5,910 acre-ft/yr (7.29 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,500 ft<sup>3</sup>/s (524 m<sup>3</sup>/s) Sept. 21, 1974, gage height, 6.40 ft (1.951 m); no flow most of time each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1900, 12 ft (3.7 m) in 1944, from information by local resident and Texas Highway Department.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 700 ft<sup>3</sup>/s (19.8 m<sup>3</sup>/s) May 12, gage height, 5.22 ft (1.591 m), no peak above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

MAY 12.....40  
13.....4.1  
TOTAL.....44.10  
MEAN.....1.42  
MAX.....40  
MIN......00  
AC-FT.....87

CAL YR 1976	TOTAL	10.52	MEAN	.029	MAX	3.3	MIN	.00	AC-FT	21
WTR YR 1977	TOTAL	44.10	MEAN	.12	MAX	40	MIN	.00	AC-FT	87

## RIO GRANDE BASIN

465

08375000 RIO GRANDE AT JOHNSON RANCH, TX

LOCATION.--Lat 29°02'05", Long 103°23'30", Brewster County, Hydrologic Unit 13040205, at gaging station about 2 mi (3 km) upstream from Johnson Ranch, 14 mi (23 km) downstream from Castolon, and 392.9 mi (632.2 km) downstream from the American Dam at El Paso.

DRAINAGE AREA.--67,760 mi<sup>2</sup> (175,498 km<sup>2</sup>), revised, United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

PERIOD OF RECORD.--Chemical analyses: June 1947 to current year.

REMARKS.--Records of specific conductance and discharge for water year 1977 are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS- CHARGE (CFS)	SPF- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)
OCT								
01-31	844	1520	8.0	340	180	110	17	190
NOV								
01-30	455	2080	7.9	430	270	130	26	280
DEC								
01-31	551	2040	8.1	450	280	140	25	280
JAN								
01-31	389	2270	8.1	460	280	140	26	320
FEB								
01-28	272	2390	7.7	500	330	150	30	350
MAR								
01-31	882	1310	8.1	300	140	94	16	170
APR								
01-30	1430	1190	8.0	290	130	90	16	160
DATE	SODIUM AD- SORP- TION RATIO	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)
OCT								
01-31	4.5	196	0	--	150	--	--	--
NOV								
01-30	5.9	196	0	--	290	--	--	--
DEC								
01-31	5.7	212	0	--	280	--	--	--
JAN								
01-31	6.5	220	0	--	310	--	--	--
FEB								
01-28	6.8	210	0	--	330	--	--	--
MAR								
01-31	4.3	200	0	370	86	30	865	.69
APR								
01-30	4.1	190	0	--	61	--	--	--



## RIO GRANDE BASIN

08376300 SANDERSON CANYON AT SANDERSON, TX

LOCATION.--Lat 30°07'42", long 102°23'04", Terrell County, Hydrologic Unit 13040208, on left bank at upstream side of bridge on U.S. Highway 90, 1.0 mi (1.6 km) south of Sanderson, 2.9 mi (4.7 km) downstream from Three Mile Draw, and 30 mi (48 km) upstream from mouth.

DRAINAGE AREA.--195 mi<sup>2</sup> (505 km<sup>2</sup>).

PERIOD OF RECORD.--February 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,706.35 ft (824.895 m) above mean sea level.

REMARKS.--Records excellent. No known regulation or diversion above the station. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--9 years, 10.3 ft<sup>3</sup>/s (0.292 m<sup>3</sup>/s), 0.72 in/yr (18 mm/yr), 7,460 acre-ft/yr (9.20 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,600 ft<sup>3</sup>/s (923 m<sup>3</sup>/s) Sept. 18, 1969, gage height, 9.18 ft (2.798 m); maximum gage height, 9.44 ft (2.877 m) Apr. 30, 1974; no flow most of time each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum flood since at least 1935, 14.2 ft (4.33 m) June 11, 1965, discharge about 100,000 ft<sup>3</sup>/s (2,830 m<sup>3</sup>/s) by combining two slope-area measurements within 4 mi (6 km) upstream from gage. The next highest flood was that of Sept. 18, 1969. Flood in 1935 reached a discharge of about 20,000 ft<sup>3</sup>/s (566 m<sup>3</sup>/s) estimated channel capacity by Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--No flow during year, no peak above base of 1,500 ft<sup>3</sup>/s (42.5 m<sup>3</sup>/s).

RIO GRANDE BASIN

467

08377200 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TX  
(National stream-quality accounting network)

LOCATION.--Lat 29°46'50", long 101°45'20", Val Verde County, Hydrologic Unit 13040212, at gaging station 0.1 mi (0.2 km) downstream from Terrell-Val Verde County line, 16.9 mi (27.2 km) from Langtry, and 597.2 mi (960.9 km) downstream from the American Dam at El Paso.

DRAINAGE AREA (revised).--80,742 mi<sup>2</sup> (209,122 km<sup>2</sup>), United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

PERIOD OF RECORD.--Chemical analyses: April 1944 to current year. Chemical and biochemical analyses: October 1974 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1974 to current year.

WATER TEMPERATURES: October 1974 to current year.

REMARKS.--Records of specific conductance and discharge for water year 1977 are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,110 micromhos Dec. 4, 1974; minimum daily, 395 micromhos May 3, 1976.

WATER TEMPERATURES: Maximum daily, 32.0°C June 13, 1977; minimum daily, 9.0°C Jan. 12, 1975, Jan. 8, 1976.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,950 micromhos Dec. 12; minimum daily, 649 micromhos May 9.

WATER TEMPERATURES: Maximum daily, 32.0°C June 13; minimum daily, 10.0°C Jan. 1, 11, 12, 19.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	RIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)
OCT										
01-31	--	1210	1210	8.3	--	--	--	--	--	--
19...	1045	1160	950	7.7	18.5	1700	8.5	93	.7	15000
NOV										
01-30	--	758	1540	7.9	--	--	--	--	--	--
17...	1115	750	156	8.0	12.0	35	10.3	99	1.7	76
DEC										
01-31	--	827	1550	8.1	--	--	--	--	--	--
15...	1040	905	1640	8.0	13.0	20	9.8	97	.8	20
JAN										
26...	1050	644	1590	7.8	15.0	20	9.5	97	1.0	56
FEB										
23...	1030	531	1530	8.1	17.0	15	9.0	96	.8	36
MAR										
23...	1115	1400	1160	7.9	15.0	240	9.4	96	.7	2800
APR										
26...	1030	1490	1140	7.9	22.0	200	8.2	96	.5	1200
MAY										
25...	1025	1220	1120	8.0	25.0	160	8.0	99	.4	1800
JUN										
22...	1030	684	1110	8.0	25.5	550	7.8	98	.6	2300
JUL										
27...	1030	838	1090	8.2	27.5	400	7.6	97	.5	2200
AUG										
23...	1200	1160	1090	8.3	29.0	850	7.3	96	1.3	3800
SEP										
21...	1035	600	1180	8.1	26.0	350	7.8	98	.5	1200

DATE	FECAL COLI- FORM 711M-MF (COL./ 100 ML)	FECAL STREP- TOCNCI KF AGAR (COL. PER 100 ML)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)
OCT									
01-31	--	--	280	140	86	17	140	3.6	--
19...	4600	10000	220	93	70	12	110	3.2	4.6
NOV									
01-30	--	--	340	200	95	24	200	4.7	--
17...	24	100	360	200	100	26	190	4.4	6.4
DEC									
01-31	--	--	340	190	97	23	190	4.5	--
15...	12	24	--	--	--	--	--	--	--
JAN									
26...	12	40	360	190	100	27	200	4.6	7.0
FEB									
23...	12	220	360	200	100	27	190	4.4	6.6
MAR									
23...	120	800	--	--	--	--	--	--	--
APR									
26...	500	560	280	130	84	17	130	3.4	6.5
MAY									
25...	660	700	260	110	79	15	140	3.8	6.7
JUN									
22...	600	1800	300	150	90	17	130	3.3	6.2
JUL									
27...	300	340	--	--	--	--	--	--	--
AUG									
27...	600	660	270	130	85	14	130	3.4	6.2
SEP									
21...	300	460	350	200	110	19	120	2.8	6.2

08377200 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	CAR- BONATE (CO <sub>3</sub> ) (MG/L)	DIS- SOLVED SULFATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)
OCT									
01-31	182	0	290	110	--	25	--	762	--
19...	160	0	230	77	1.0	18	624	602	.64
NOV									
01-30	166	0	350	190	--	23	--	967	--
17...	196	0	350	170	1.2	22	998	962	.49
DEC									
01-31	182	0	350	180	--	20	--	953	--
15...	--	--	--	--	--	--	--	--	.53
JAN									
26...	212	0	360	190	1.2	20	1040	1010	.59
FEB									
23...	196	0	340	180	1.3	20	982	962	.52
MAR									
23...	--	--	--	--	--	--	--	--	.90
APR									
26...	188	0	320	58	1.8	29	764	739	.87
MAY									
25...	180	0	320	53	1.8	28	756	732	.79
JUN									
22...	180	0	320	59	1.3	21	742	733	.77
JUL									
27...	--	--	--	--	--	--	--	--	.59
AUG									
23...	170	0	330	50	1.8	27	748	728	1.2
SEP									
21...	190	0	340	67	1.3	26	811	783	.81
DATE	TOTAL NITRITE (N) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUS- PENDE SEDIM- MENT (MG/L)	SUS- PENDE SEDIM- MENT CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT									
01-31	--	1.0	--	--	--	--	--	--	--
19...	.02	--	.05	13	1.2	2.1	3970	12400	100
NOV									
01-30	--	.67	--	--	--	--	--	--	--
17...	.00	--	.01	.37	.03	--	65	132	99
DEC									
01-31	--	.76	--	--	--	--	--	--	--
15...	.01	--	.00	.38	.13	--	54	132	93
JAN									
26...	.00	--	.01	.32	.02	--	56	97	93
FEB									
23...	.00	--	.01	.18	.02	1.6	31	44	99
MAR									
23...	.01	--	.04	.82	.30	--	504	1910	99
APR									
26...	.00	--	.01	.77	.23	--	408	1640	93
MAY									
25...	.01	--	.02	.53	.23	--	374	1230	96
JUN									
22...	.01	--	.06	.74	.38	7.6	998	1840	100
JUL									
27...	.01	--	.01	.99	.47	--	834	1890	100
AUG									
23...	.01	--	--	--	.84	27	1790	5610	98
SEP									
21...	.00	--	--	--	.40	7.0	580	940	100

## RIO GRANDE BASIN

469

08377200 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED BORON (B) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)
OCT										
01-31	--	--	--	--	--	240	--	--	--	--
19...	1045	16	6	--	200	--	0	0	50	0
NOV										
01-30	--	--	--	--	--	290	--	--	--	--
DEC										
01-31	--	--	--	--	--	250	--	--	--	--
FEB										
23...	1030	5	3	--	100	--	0	0	30	8
JUN										
22...	1030	12	7	--	200	--	10	2	20	0
AUG										
23...	1200	9	6	2200	200	--	10	1	60	0
DATE		TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)
OCT										
01-31	--	--	--	--	--	--	--	--	--	--
19...	20	0	44	2	62000	20	10	0	20	
NOV										
01-30	--	--	--	--	--	--	--	--	--	--
DEC										
01-31	--	--	--	--	--	--	--	--	--	--
FEB										
23...	0	0	0	0	450	0	0	0	30	
JUN										
22...	<50	0	20	6	12000	10	<100	0	320	
AUG										
23...	150	0	100	1	97000	20	200	0	3000	
DATE		DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
OCT										
01-31	--	--	--	--	--	--	--	--	--	--
19...	10	.1	.0	2	2	--	0	250	10	
NOV										
01-30	--	--	--	--	--	--	--	--	--	--
DEC										
01-31	--	--	--	--	--	--	--	--	--	--
FEB										
23...	10	.4	.0	1	0	--	0	10	10	
JUN										
22...	4	.0	.0	3	3	--	0	60	2	
AUG										
23...	0	.2	.0	8	4	10	0	450	0	

08377200 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)	TOTAL ENDRIN (UG/L)
NOV 17...	1115	ND	ND	ND	ND	ND	ND	ND	ND
JAN 26...	0840	ND	ND	ND	ND	ND	ND	ND	ND
APR 26...	1030	ND	ND	ND	ND	ND	ND	ND	ND
AUG 23...	1200	ND	ND	ND	ND	ND	ND	ND	ND

DATE	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METH- OXY- CHLOR (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)	TOTAL PARA- THION (UG/L)
NOV 17...	ND	ND	ND	ND	ND	ND	ND	ND	ND
JAN 26...	ND	ND	ND	ND	ND	ND	ND	ND	ND
APR 26...	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 23...	ND	ND	ND	ND	ND	ND	ND	ND	ND

DATE	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL ATRA- ZINE (UG/L)	SIMA- ZINE TOTAL COUL- SON COND. (UG/L)	SIMA- ZINE IN BOTTOM MATERI- AL (UG/ KG DRY SOLIDS)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 17...	ND	ND	ND	ND	ND	ND	ND	ND
JAN 26...	ND	ND	ND	ND	--	ND	ND	ND
APR 26...	ND	ND	ND	ND	--	ND	ND	ND
AUG 23...	ND	ND	ND	ND	--	ND	ND	ND

08377200 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 19,76 1045	NOV 17,76 1115	DEC 15,76 1040	JAN 26,77 1050	FEB 23,77 1030	
TOTAL CELLS/ML	210	1800	4400	3400	5300	
DIVERSITY: DIVISION	0.9	1.3	1.0	1.2	1.5	
..CLASS	0.9	1.3	1.0	1.2	1.5	
..ORDER	0.9	1.7	1.4	1.6	1.9	
...FAMILY	1.3	1.9	1.9	2.2	2.5	
....GENUS	1.3	1.9	2.5	2.9	2.5	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)						
..CHLOROPHYCEAE						
...CHLOROCOCCALES						
....CHARACIACEAE	--	-	--	-	--	-
....SCHROEDERIA	--	-	--	-	--	-
....MICRACTINIACEAE						
....GOLFENKINIA	--	-	65	1	--	-
....OOCYSTACEAE						
....ANKISTRODESMUS	--	-	130	3	790#	23
....DICTYOSPHAERIUM	--	-	--	-	310	9
....FRANCEIA	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	*	0	--	-
....OOCYSTIS	--	-	24	1	200	6
....TREUBARIA	--	-	--	-	*	0
....SCENEDESMACEAE						
....CRUCIGENIA	--	-	84	5	--	-
....SCENEDESMUS	75#	36	48	3	590#	17
....TETRASTRUM	--	-	--	-	160	5
..TETRASPORALES						
...COCCOMYXACEAE						
....FLAKATOTHRIX	--	-	--	-	--	-
..VOLVOCALES						
...CHLAMYDOMONADACEAE						
....CHLAMYDOMONAS	--	-	--	-	65	1
CHRYSPHYTA						
..BACILLARIOPHYCEAE						
...PENNALES						
....NAVICULACEAE						
....PENTOMONEIS	--	-	--	-	110	2
..CENTRALES						
...COSCINODISCACEAE						
....CYCLOTELLA	--	-	54	3	1800#	41
....MELOSIRA	--	-	--	-	880#	26
...PENNALES						
....ACHNANTHACEAE						
....ACHNANTHES	--	-	--	-	39	1
....COCCONEIS	--	-	--	-	--	-
....RHOICOSPHEINIA	--	-	--	-	--	-
....CYMBELLACEAE						
....CYMBELLA	--	-	--	-	*	0
...FRAGILARIACEAE						
....ASTERIONELLA	--	-	18	1	--	-
....FRAGILARIA	--	-	--	-	59	2
....SYNEDRA	--	-	--	-	*	0
...NAVICULACEAE						
....NAVICULA	19	9	36	2	*	0
....NEIDIUM	--	-	--	-	--	-
....PINNULARIA	--	-	--	-	*	0
...NITZSCHACEAE						
....DENTICULA	--	-	--	-	*	0
....NITZSCHIA	110#	55	380#	22	130	3
..CHRYSPHYCEAE						
...CHRYSPHOMONADALES						
....OCHROMONADACEAE						
....DINORRYON	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)						
..CYANOPHYCEAE						
...CHROCOCCOCCALES						
....CHROCOCCOCCACEAE						
....AGMENELLUM	--	-	--	-	--	-
....ANACYSTIS	--	-	60	3	200	6
...HORMOGONALES						
....OSCILLATORIACEAE	--	-	--	-	--	-
....OSCILLATORIA	--	-	1100#	59	--	-
EUGLENOPHYTA (EUGLENOIDS)						
..CRYPTOPHYCEAE						
...CRYPTOMONIDALES						
....CRYPTOMONODACEAE						
....CRYPTOMONAS	--	-	--	-	*	0
..EUGLENOPHYCEAE						
...EUGLENALES						
....EUGLENACEAE						
....EUGLENA	--	-	--	-	--	-
....TRACHELOMONAS	--	-	24	1	20	1

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%



08377200 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	MAY 25.77 1025	JUN 22.77 1030	JUL 27.77 1030	AUG 23.77 1200	SEP 21.77 1035	
TOTAL CELLS/ML	10000	380	4500	570	1200	
DIVERSITY: DIVISION	1.5	0.9	1.2	1.0	1.0	
..CLASS	1.5	0.9	1.2	1.0	1.0	
..ORDER	2.1	0.9	1.2	1.0	1.0	
...FAMILY	2.6	1.6	2.3	1.0	1.1	
....GENUS	0.0	1.6	2.3	1.0	1.3	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)						
..CHLOROPHYCEAE						
...CHLOROCOCCALES						
....CHARACIACEAE						
....SCHROEDERIA	--	-	--	-	--	-
....MICRACTINIACEAE						
....GOLFENKINIA	* 0	--	-	--	-	14 1
....OOCYSTACEAE						
....ANKISTRODESMUS	250 2	--	-	--	-	--
....DICTYOSPHAERIUM	660 6	--	-	--	-	57 5
....FRANCEIA	* 0	--	-	--	-	--
....KIRCHNERIELLA	--	-	--	-	--	-
....OOCYSTIS	500 5	130# 33	200 5	--	-	--
....TREPUBARIA	--	-	--	-	--	-
....SCENEDESMACEAE						
....CRUCIGENTIA	--	-	--	-	--	-
....SCENEDESMUS	2400# 23	130# 33	810# 18	--	-	--
....TETRASTRUM	--	-	--	-	--	-
....TETRASPORALES						
....COCCOMYXACEAE						
....FLAKATOTHRIX	170 2	--	-	--	-	--
....VOLVOCALES						
....CHLAMYDOMONADACEAE						
....CHLAMYDOMONAS	83 1	--	-	--	-	--
CHRYSOPHYTA						
..BACILLARIOPHYCEAE						
...PENNIALES						
....NAVICULACEAE						
....ENTOMONEIS	--	-	--	-	--	-
...CENTRALES						
....COSCINODISCACEAE						
....CYCLOTELLA	660 6	--	-	--	-	--
....MELOSIRA	* 0	--	-	--	-	--
...PENNIALES						
....ACHNANTHACEAE						
....ACHNANTHES	--	-	--	-	--	-
....COCCONEIS	--	-	410 9	--	-	--
....RHOTICOSPHEINIA	--	-	* 0	--	-	--
....CYMBELLACEAE						
....CYMBELLA	--	-	--	-	--	-
....FRAGILARIACEAE						
....ASTERIONELLA	--	-	--	-	--	-
....FRAGILARIA	--	-	--	-	--	-
....SYNEDRA	* 0	--	-	410 9	--	-
....NAVICULACEAE						
....NAVICULA	* 0	--	-	200 5	--	-
....NEIDIUM	--	-	--	-	290# 50	29 2
....PINNULARIA	--	-	--	-	--	-
....NITZSCHIA	--	-	--	-	--	-
....DENTICULA	--	-	--	-	* 0	100 8
....NITZSCHIA	750 7	130# 33	2000# 45	--	-	86 7
CHRYSOPHYCEAE						
..CHRYSOMONADALES						
....OCHROMONADACEAE						
....DINOBRYON	83 1	--	-	--	-	--
CYANOPHYTA (BLUE-GREEN ALGAE)						
..CYANOPHYCEAE						
...CHROCOCCOCCALES						
....CHROCOCCOCCAEAE						
....AGMENELLUM	3600# 35	--	-	--	-	--
....ANACYSTIS	--	-	--	-	--	-
..HORMOGONALES						
....OSCILLATORIA	950 9	--	-	--	-	--
....OSCILLATORIA	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENIDS)						
..CRYPTOPHYCEAE						
...CRYPTOMONIDAE						
....CRYPTOMONODACEAE						
....CRYPTOMONAS	--	-	--	-	--	-
..EUGLENOPHYCEAE						
...EUGLENALES						
....EUGLENACEAE						
....EUGLENA	--	-	410 9	--	-	--
....TRACHELOMONAS	--	-	--	-	290# 50	--

NOTE: # - DOMINANT ORGANISM: EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED: LESS THAN 1/2%

## 08377200 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA-MG) (MG/L)
OCT. 1976.....	37502	1190	770	77900	84	8520	320	32000	290
NOV. 1976.....	22745	1550	1000	61400	170	10100	350	21600	360
DEC. 1976.....	25628	1540	990	68700	160	11300	350	24200	350
JAN. 1977.....	21485	1590	1030	59800	180	10300	360	20700	370
FEB. 1977.....	16039	1530	990	43000	160	7030	350	15200	350
MAR. 1977.....	28879	1250	810	63200	99	7760	320	25200	300
APR. 1977.....	44480	1090	700	84400	68	8120	290	35100	270
MAY 1977.....	50000	1040	670	90300	61	8250	280	37200	260
JUNE 1977.....	29698	1120	720	58000	72	5810	300	24000	280
JULY 1977.....	33938	1020	660	60600	59	5370	270	24900	260
AUG. 1977.....	34038	1070	690	63700	66	6030	290	26300	270
SEPT 1977.....	24668	1070	690	46100	65	4340	290	19100	270
TOTAL .....	369100	**	**	777000	**	92900	**	305000	**
WTD.AVG. ....	1011.23	1210	780	**	93	**	310	**	290

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1210	1460	1660	1630	1530	1420	1090	1070	1090	991	1130	1060
2	1180	1470	1650	1590	1520	1400	1100	1080	1100	1000	1080	1110
3	1170	1400	1630	1610	1520	1380	1090	1090	1120	1010	1090	1100
4	1160	1430	1600	1630	1700	1370	1110	916	1140	934	1010	1120
5	1170	1460	1570	1650	1650	1360	1100	1050	1100	1010	1040	1100
6	1210	1440	1550	1620	1560	1350	1110	1060	1110	1090	987	1100
7	1180	1420	1540	1630	1510	1360	1100	1080	1080	987	1000	1100
8	1170	1470	1570	1620	1520	1320	1110	1080	1070	915	987	1060
9	1160	1490	1580	1610	1510	1360	1120	649	1010	743	933	1110
10	1150	1500	1610	1590	1530	1310	1110	1030	1100	866	1040	1040
11	1140	1510	1720	1600	1520	1300	1100	1090	1080	1070	1050	953
12	1120	1520	1950	1590	1530	1300	1100	946	1190	987	1070	732
13	1110	1530	1660	1580	1580	1310	1090	1090	1240	1000	1160	1020
14	1090	1540	1620	1590	1530	1320	1020	954	1280	1120	1250	1040
15	1050	1560	1630	1610	1550	1350	1090	1130	1210	1160	1270	911
16	1080	1550	1680	1630	1550	1320	1200	1160	1280	1170	1130	1150
17	1240	1560	1750	1620	1530	1470	1140	909	1210	1170	1170	882
18	1330	1550	1310	1620	1520	1830	953	848	1070	1130	1170	1170
19	1170	1570	1250	1610	1540	1480	1060	809	1170	1060	871	1140
20	793	1600	1240	1620	1550	1240	1070	1030	1190	1010	907	1070
21	1120	1620	1140	1590	1570	1170	1090	1110	1030	970	1130	1180
22	1250	1670	1060	1580	1540	1160	1080	1130	1070	962	1070	1200
23	1290	1700	1130	1570	1530	1140	1090	1120	1260	1000	1090	1110
24	1360	1690	1300	1580	1490	1130	1100	1130	1330	1000	1090	1150
25	1220	1670	1420	1570	1480	1130	1160	1130	987	1110	1060	1130
26	1260	1620	1580	1570	1460	1110	1100	1120	1170	1010	1110	1120
27	1340	1580	1610	1560	1430	1110	1090	1120	1100	1130	1140	1080
28	1400	1600	1630	1550	1440	1100	1090	1130	1080	1170	1120	1070
29	1180	1520	1640	1520	---	1100	1080	1120	951	1100	817	1080
30	1360	1640	1660	1510	---	1110	892	1130	1030	1070	1130	1050
31	1450	---	1640	1500	---	1100	---	1030	---	1140	1080	---
MEAN	1200	1540	1530	1590	1530	1290	1090	1040	1130	1040	1070	1070

## RIO GRANDE BASIN

08377200 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24.5	19.0	11.0	10.0	14.0	17.0	21.5	26.0	30.0	29.5	30.0	29.0
2	25.0	19.0	11.5	11.5	14.0	19.0	21.0	28.0	31.0	29.5	31.0	27.0
3	26.5	20.0	12.0	11.5	14.5	18.5	23.0	26.0	30.0	29.5	28.5	29.0
4	26.0	20.0	13.0	11.0	15.5	16.0	21.5	24.0	28.0	26.5	26.0	30.0
5	25.5	20.5	13.0	13.0	16.0	15.0	21.0	27.0	28.0	28.0	27.0	29.0
6	25.0	18.0	14.0	14.0	16.0	18.0	21.5	28.0	29.0	28.0	29.0	29.0
7	20.5	18.0	11.0	13.0	14.0	19.0	21.0	25.5	29.0	28.0	30.0	30.0
8	21.0	19.0	14.0	13.5	14.5	18.5	22.0	28.0	27.0	27.0	29.0	30.0
9	22.0	19.5	12.0	11.5	15.5	18.0	23.0	26.0	29.0	30.0	29.0	29.0
10	20.0	20.0	13.5	11.0	15.0	19.0	22.0	26.0	---	30.0	29.0	29.5
11	22.0	20.0	13.0	10.0	16.5	19.5	22.0	26.0	30.0	30.5	28.0	29.0
12	22.0	15.0	14.0	10.0	18.0	19.5	23.0	25.0	30.5	29.0	29.5	29.5
13	22.0	12.0	13.0	11.5	17.0	20.0	21.5	25.0	32.0	---	29.0	29.0
14	23.0	14.0	15.5	14.5	18.0	20.5	22.0	25.5	28.5	29.5	29.5	29.0
15	22.0	14.0	13.0	14.5	17.0	24.0	23.5	27.0	31.5	27.0	29.0	29.0
16	22.0	13.0	13.5	11.5	18.0	21.0	22.0	27.0	28.0	29.0	30.0	28.0
17	22.0	13.5	12.0	12.0	16.0	24.0	22.0	27.0	26.0	29.0	30.0	25.0
18	22.0	14.0	12.0	13.0	---	21.0	25.0	27.0	30.5	29.0	30.5	29.0
19	20.0	18.0	13.5	10.0	19.0	21.0	24.0	27.0	30.0	29.0	30.5	29.5
20	19.0	18.0	13.0	13.0	18.5	18.0	26.0	28.0	29.5	30.5	28.0	29.5
21	18.0	16.0	12.0	14.0	19.0	20.5	25.0	29.0	28.0	29.0	30.0	27.0
22	19.0	16.0	11.0	15.0	20.5	19.0	23.0	27.5	29.0	29.0	30.5	28.0
23	19.5	16.5	10.5	16.5	19.5	16.0	25.0	27.5	28.5	30.0	31.5	29.0
24	20.5	16.0	13.0	18.0	20.5	---	25.5	27.5	26.0	30.5	31.0	29.0
25	20.5	16.5	13.0	16.0	19.5	18.5	22.0	27.0	28.0	30.0	30.0	30.0
26	19.0	18.0	11.5	17.0	18.0	21.5	24.0	28.0	29.5	31.0	30.0	30.5
27	18.0	15.0	12.0	18.5	17.0	---	21.5	29.0	30.0	30.0	29.0	31.0
28	16.5	12.0	13.5	18.0	18.0	20.0	25.0	30.5	29.0	30.0	29.0	30.0
29	15.0	11.5	13.0	14.0	---	22.0	26.0	29.0	29.0	28.5	29.5	29.5
30	18.0	12.0	13.5	13.0	---	21.5	25.0	29.0	30.0	30.0	30.0	29.0
31	18.5	---	11.0	14.0	---	20.0	---	29.0	---	30.5	30.5	---
MEAN	21.0	16.5	12.5	13.5	17.0	19.5	23.0	27.0	29.0	29.0	29.5	29.0

## RIO GRANDE BASIN

475

## 08407500 PECOS RIVER AT RED BLUFF, NM

LOCATION.--Lat 32°04'30", Long 104°02'21", in SW 1/4 NE 1/4 sec. 1, T.26 S., R.28 E., Eddy County, Hydrologic Unit 13060011, on right bank at Red Bluff, 0.2 mi (0.3 km) downstream from Red Bluff Draw, 1.6 mi (2.6 km) northwest of the El Paso Natural Gas (Pecos River) compressor station, 5.2 mi (8.4 km) north of the New Mexico-Texas State line, 5.5 mi (8.8 km) upstream from Delaware River, and 411.2 mi (661.6 km) upstream from mouth. Water-quality sampling site 1.4 mi (2.3 km) downstream and 409.8 mi (659.4 km) upstream from mouth.

DRAINAGE AREA.--19,540 mi<sup>2</sup> (50,610 km<sup>2</sup>), approximately (contributing area).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1937 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,850.05 ft (868.695 m) above mean sea level.

REMARKS.--Water-discharge records fair. Flow regulated by storage in Lake Sumner, Lake McMillan, Lake Avalon, and by several small diversion dams that divert for power or irrigation. Diversions and ground-water withdrawals above station for irrigation of about 202,000 acres (820 km<sup>2</sup>), 1959 determination.

AVERAGE DISCHARGE.--40 years, 179 ft<sup>3</sup>/s (5.069 m<sup>3</sup>/s), 129,700 acre-ft/yr (160 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 111,000 ft<sup>3</sup>/s (3,140 m<sup>3</sup>/s) Aug. 23, 1966, gage height, 33.32 ft (10.156 m), from rating curve extended above 30,000 ft<sup>3</sup>/s (850 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; minimum, 0.19 ft<sup>3</sup>/s (0.005 m<sup>3</sup>/s) Aug. 1, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--The flood of Aug. 23, 1966, exceeded all floods at this location. Flood in October 1904 reached a stage of 28.0 ft (8.53 m), from information by Panhandle and Santa Fe Railway Co.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 287 ft<sup>3</sup>/s (8.13 m<sup>3</sup>/s) June 20, gage height, 4.62 ft (1.408 m); minimum, 1.10 ft<sup>3</sup>/s (0.031 m<sup>3</sup>/s) Sept. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	34	41	20	28	26	31	12	9.4	6.5	6.8	4.2
2	16	34	42	22	27	27	29	12	9.4	6.2	6.5	2.6
3	22	32	43	25	28	26	21	12	9.0	6.2	6.2	1.7
4	25	30	43	26	28	25	19	12	9.0	5.6	5.6	1.3
5	23	31	42	28	27	30	24	17	9.4	6.2	5.3	18
6	22	31	41	28	28	34	28	16	9.4	6.8	4.4	12
7	20	30	40	28	28	28	24	13	9.9	7.4	4.7	12
8	16	29	40	30	27	27	24	14	9.4	9.4	5.3	6.5
9	14	30	40	30	28	34	33	14	9.0	9.0	5.6	3.8
10	14	35	40	29	28	33	27	12	9.0	7.8	6.8	4.2
11	16	33	34	30	28	30	22	11	10	8.2	6.8	3.8
12	15	31	28	35	28	28	18	13	11	6.8	7.1	2.8
13	14	33	24	40	28	33	17	18	11	5.6	5.3	2.1
14	14	34	23	41	28	33	21	15	9.4	4.7	5.0	4.0
15	14	38	22	43	28	28	22	20	8.6	4.7	5.0	5.6
16	13	50	22	43	28	25	25	13	8.2	4.7	4.4	7.4
17	9.4	54	22	38	27	26	47	12	7.8	5.3	4.2	9.4
18	12	41	22	32	27	26	39	12	6.8	5.0	4.0	9.9
19	24	40	23	31	27	22	25	11	6.8	4.4	4.0	7.8
20	14	39	23	30	27	19	20	9.9	44	4.2	4.2	7.1
21	9.0	38	23	30	27	16	17	9.4	54	4.2	4.4	6.5
22	7.8	37	23	30	25	16	14	9.0	11	4.7	4.2	6.2
23	9.4	38	24	29	26	14	13	9.9	18	4.4	3.8	6.2
24	20	36	24	29	22	13	13	13	9.9	4.2	4.4	6.5
25	22	39	24	28	22	14	13	12	9.9	4.4	4.7	6.8
26	20	39	22	29	25	13	13	13	10	4.4	6.0	5.6
27	19	39	22	30	21	14	13	12	9.9	5.6	7.1	3.4
28	22	40	22	30	22	17	12	10	8.6	9.4	4.7	2.4
29	28	43	22	30	---	81	13	9.9	7.4	8.2	6.8	1.8
30	30	42	22	30	---	55	11	9.0	6.8	7.4	6.5	1.4
31	32	---	20	28	---	40	---	9.4	---	7.1	5.6	---
TOTAL	548.6	1100	903	952	743	853	648	385.5	362.0	188.7	165.4	173.0
MEAN	17.7	36.7	29.1	30.7	26.5	27.5	21.6	12.4	12.1	6.09	5.34	5.77
MAX	32	54	43	43	28	81	47	20	54	9.4	7.1	18
MIN	7.8	29	20	20	21	13	11	9.0	6.8	4.2	3.8	1.3
AC-FT	1090	2180	1790	1890	1470	1690	1290	765	718	374	328	343
CAL YR 1976	TOTAL	8968.3	MEAN 24.5	MAX 258	MIN 6.5	AC-FT 17790						
WTR YR 1977	TOTAL	7022.2	MEAN 19.2	MAX 81	MIN 1.3	AC-FT 13930						

08407500 PECOS RIVER AT RED BLUFF, NM--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1937 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1937 to current year.

WATER TEMPERATURES: October 1952 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 51,400 micromhos June 20, 1972; minimum daily, 268 micromhos Sept. 18, 1946.

WATER TEMPERATURES: Maximum daily, 36.0°C July 31, 1966, July 13, 1970; minimum daily, 1.0°C Jan. 10, 11, 1962, Jan. 13, 1963.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 45,000 micromhos Sept. 30; minimum daily, 11,100 micromhos Dec. 11, 12.

WATER TEMPERATURES: Maximum daily, 32.0°C June 25, 26; minimum daily, 4.0°C Dec. 4, Jan. 11.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	FECAL COLIFORM .7UM-MF (COL./100 ML)	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA, MG)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)
OCT 04...	1215	24	--	--	22.0	--	--	--	--	--	--	--
07...	1200	20	22000	7.9	18.0	15	9.8	67	--	2300	2200	480
NOV 01...	1115	34	--	--	17.5	--	--	--	--	--	--	--
11...	1100	33	14800	7.7	9.5	4	11.6	0	--	2700	2600	600
DEC 01...	1100	41	--	--	4.0	--	--	--	--	--	--	--
15...	1600	22	12000	7.9	8.0	4	12.4	0	--	2000	1900	460
16...	1515	22	--	--	7.5	--	--	--	--	--	--	--
JAN 19...	1420	32	14000	8.1	8.0	2	12.2	5	--	2400	2200	530
FEB 17...	1145	28	15000	8.2	12.5	4	12.9	0	--	2400	2200	530
MAR 23...	1430	14	20000	8.4	16.5	6	8.5	0	--	2500	2400	520
APR 28...	1500	13	19400	8.0	25.0	4500	13.8	4	58	2600	2500	560
MAY 19...	1400	11	39500	8.3	26.5	5	14.4	6	150	3000	2900	600
JUN 30...	0645	6.5	24000	7.6	26.0	2	3.3	800	370	2700	2500	550
JUL 28...	0900	7.4	36500	8.2	27.0	7	6.3	41	800	4000	3900	830
AUG 24...	0745	4.2	42000	8.1	27.5	3	6.1	0	3400	4400	4300	850

DATE	DISSOLVED MAGNESIUM (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SiO2) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)
OCT 04...	--	--	--	--	--	--	--	--	--	--	--
07...	270	4300	39	170	110	0	2000	6500	.7	12	14300
NOV 01...	--	--	--	--	--	--	--	--	--	--	--
11...	290	2600	22	99	148	0	2200	4300	.8	9.3	10600
DEC 01...	--	--	--	--	--	--	--	--	--	--	--
15...	210	2000	19	70	157	0	1800	3100	.8	6.1	8050
16...	--	--	--	--	--	--	--	--	--	--	--
JAN 19...	250	2300	21	82	154	0	2000	3800	.8	7.6	9320
FEB 17...	250	2600	23	97	158	0	1900	4300	.8	6.4	10300
MAR 23...	290	3700	32	110	140	0	1900	6200	.8	6.8	13200
APR 28...	300	3700	31	140	120	0	2400	5900	1.0	.8	13300
MAY 19...	360	5900	47	230	130	0	2700	9200	1.0	5.8	19900
JUN 30...	310	5000	42	180	130	0	2300	8000	.8	6.3	16400
JUL 28...	470	8100	56	300	110	0	3500	13000	.9	4.2	26400
AUG 24...	550	9600	63	360	100	0	3900	15000	1.4	2.9	30500

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	TOTAL FILT- RABLE RESIDUE (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUS- PENDE SEDIM- ENT (MG/L)	SUS- PENDE SEDIM- ENT OIS- CHARGE (T/DAY)	SUS- SED. SIEVE DIAM. % FINER THAN .062 MM
OCT 04...	--	--	--	--	--	--	--	--	--	--	--
07...	13800	--	--	.01	.00	.82	.05	--	23	1.2	95
NOV 01...	--	--	--	--	--	--	--	--	--	--	--
11...	10200	11000	8	.46	.36	.94	.09	--	27	2.4	87
DEC 01...	--	--	--	--	--	--	--	--	--	--	--
15...	7730	--	--	.68	.16	.70	.05	4.3	20	1.2	91
16...	--	--	--	--	--	--	--	--	--	--	--
JAN 19...	9050	--	--	1.1	.13	.13	.03	--	--	--	--
FEB 17...	9770	--	--	.65	.03	.62	.04	5.1	--	--	--
MAR 23...	12800	--	--	.03	.01	.83	.05	8.1	--	--	--
APR 28...	13100	--	--	.01	.11	.86	.02	--	--	--	--
MAY 19...	19100	--	--	.02	.12	1.6	.07	--	--	--	--
JUN 30...	16400	--	--	.02	.41	.17	.04	--	--	--	--
JUL 28...	26300	--	--	.05	.11	1.3	.05	--	--	--	--
AUG 24...	30300	--	--	.04	.05	1.2	.14	--	--	--	--

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	DIS- SOLVED BORON (B) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)
OCT 07...	1200	1	1	1300	60	0	20	10	200	0	20	1
NOV 11...	1100	--	--	860	--	--	--	--	--	--	--	--
DEC 15...	1600	1	0	650	10	0	0	0	100	0	20	2
JAN 19...	1420	--	--	770	--	--	--	--	--	--	--	--
FEB 17...	1145	--	--	860	--	--	--	--	--	--	--	--
MAR 23...	1430	1	1	1100	20	0	10	10	50	0	30	0
APR 28...	1500	--	--	1100	--	--	--	--	--	--	--	--
MAY 19...	1400	--	--	1600	--	--	--	--	--	--	--	--
JUN 30...	0645	3	3	1400	30	2	20	20	150	1	20	20
JUL 28...	0900	--	--	2300	--	--	--	--	--	--	--	--
AUG 24...	0745	--	--	2800	--	--	--	--	--	--	--	--

DATE	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
OCT 07...	740	30	100	5	70	30	.0	.0	2	1	40	40
NOV 11...	--	10	--	--	--	--	--	--	--	--	--	--
DEC 15...	110	0	100	1	40	40	.1	.1	2	1	90	90
JAN 19...	--	10	--	--	--	--	--	--	--	--	--	--
FEB 17...	--	20	--	--	--	--	--	--	--	--	--	--
MAR 23...	280	20	200	2	90	50	.0	.0	2	1	50	40
APR 28...	--	20	--	--	--	--	--	--	--	--	--	--
MAY 19...	--	40	--	--	--	--	--	--	--	--	--	--
JUN 30...	180	180	200	5	180	140	.0	.0	2	2	60	40
JUL 28...	--	30	--	--	--	--	--	--	--	--	--	--
AUG 24...	--	30	--	--	--	--	--	--	--	--	--	--



## RIO GRANDE BASIN

08407500 PECOS RIVER AT RED BLUFF, NM.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL CHLOR- DANE (UG/L)	CHLOR- DANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MA- TERIAL (UG/KG)	P.P.D. DDE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DDT (UG/L)	DDT IN BOTTOM MA- TERIAL (UG/KG)
DEC 27...	1600	ND	ND	ND	ND	ND	ND	ND	--	2.1	ND	ND
FEB 17...	1145	ND	--	ND	--	ND	--	ND	--	--	ND	--
MAY 19...	1400	ND	ND	ND	ND	ND	ND	ND	ND	--	ND	ND
AUG 04...	0745	ND	--	ND	--	ND	--	ND	--	--	ND	--

DATE	TOTAL DI- AZINON (UG/L)	DI- AZINON IN BOTTOM MA- TERIAL (UG/KG)	TOTAL DI- ELDRIN (UG/L)	DI- ELDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ETHION (UG/L)	ETHION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR (UG/L)	HEPTA- CHLOR IN BOTTOM MA- TERIAL (UG/KG)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	HEPTA- CHLOR EPOXIDE IN BOT- TOM MA- TERIAL (UG/KG)
DEC 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 17...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--
MAY 19...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 04...	ND	--	ND	--	ND	--	ND	--	ND	--	ND	--

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL MALA- THION (UG/L)	MALA- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL METH- OXY- CHLOR (UG/L)	METHOX- YCHLOR IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL METHYL PARA- THION (UG/L)	METHYL PARA- THION IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL METHYL TRI- THION (UG/L)	METHYL TRI- THION IN BOT- TOM MA- TERIAL (UG/KG)	TOTAL PARA- THION (UG/L)
DEC 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 17...	ND	--	ND	--	ND	--	ND	--	ND	--	ND
MAY 19...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 04...	ND	--	ND	--	ND	--	ND	--	ND	--	ND

DATE	PARA- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TOX- APHENE (UG/L)	TOX- APHENE IN BOTTOM MA- TERIAL (UG/KG)	TOTAL TRI- THION (UG/L)	TRI- THION IN BOTTOM MA- TERIAL (UG/KG)	TOTAL ATRA- ZINE (UG/L)	SIMA- ZINE TOTAL COUL- SON COND. (UG/L)	SIMA- ZINE IN BOTTOM MA- TERIAL (UG/ KG DRY SOLIDS)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
DEC 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 17...	--	ND	--	ND	--	ND	ND	--	ND	ND	ND
MAY 19...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 04...	--	ND	--	ND	--	ND	ND	--	ND	ND	ND

08407500 PECOS RIVER AT RED BLUFF, NM.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO AUGUST 1977

DATE TIME	OCT 7,76 1200	NOV 11,76 1100	DEC 15,76 1600	JAN 19,77 1420	FEB 17,77 1145					
TOTAL CELLS/ML	210000	260000	13000	3500	15000					
DIVERSITY: DIVISION	0.0	0.1	1.6	0.9	1.0					
..CLASS	0.0	0.1	1.6	0.9	1.0					
...ORDER	0.2	0.4	2.2	1.8	1.3					
...FAMILY	0.2	0.4	2.3	2.1	0.0					
...GENUS	0.7	0.7	2.6	2.3	0.0					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES	--	-	--	-	--	-	--	-	4600#	31
...CHARACIACEAE	--	-	--	-	--	-	22	1	--	-
...SCHROEDERIA	--	-	--	-	--	-	--	-	--	-
...COELASTRACEAE	--	-	--	-	--	-	--	-	--	-
...COELASTRUM	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE	--	-	--	-	--	-	--	-	--	-
...ANKISTRODESMUS	--	-	--	-	120	1	--	-	250	2
...DICTYOSPHAERIUM	--	-	* 0		--	-	--	-	--	-
...KIRCHNERIELLA	--	-	--	-	--	-	--	-	990	7
...OOCYSTIS	--	-	--	-	240	2	88	3	250	2
...TREUBARIA	--	-	--	-	--	-	22	1	--	-
...SCENEDESMACEAE	--	-	--	-	--	-	--	-	--	-
...SCENEDESMUS	--	-	* 0		1600	13	1500#	43	3300#	22
...OEDOGONIALES	--	-	--	-	--	-	--	-	--	-
...OEDOGONIACEAE	--	-	--	-	* 0		--	-	--	-
...OEDOGONIUM	--	-	--	-	--	-	--	-	--	-
...VOLVOCALES	--	-	--	-	* 0		--	-	--	-
...CHLAMYDOMONADACEAE	--	-	--	-	--	-	--	-	--	-
...CARTERIA	--	-	--	-	300	2	--	-	--	-
...CHLAMYDOMONAS	--	-	--	-	420	3	970#	28	--	-
...CHLOROGONIUM	--	-	--	-	360	3	22	1	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...CHAETOCERACEAE										
...CHAETOCEROS	--	-	--	-	--	-	--	-	--	-
...COSCINODISCACEAE										
...CYCLOTELLA	--	-	* 0		2400#	19	400	11	3500#	24
...MELOSIRA	--	-	--	-	420	3	180	5	--	-
...PENNIALES										
...CYMBELLACEAE										
...CYMBELLA	--	-	--	-	* 0		--	-	--	-
...FRAGILARIACEAE										
...SYNEDRA	--	-	--	-	--	-	--	-	--	-
...NAVICULACEAE										
...GYROSIGMA	--	-	--	-	--	-	--	-	* 0	
...NAVICULA	* 0		--	-	* 0		130	4	* 0	
...PLEUROSIGMA	* 0		--	-	--	-	--	-	--	-
...NITZSCHIA										
...NITZSCHIA	* 0		--	-	1200	9	44	1	1700	12
..CHRYSOPHYCEAE										
...CHRYSONOMADACEAE										
...MALLONADACEAE										
...MALLONAS	--	-	--	-	--	-	22	1	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCOCCALES										
...CHROCOCCACEAE										
...AGMENELLUM	3500	2	11000	4	--	-	--	-	* 0	
...ANACYSTIS	--	-	1400	1	5300#	42	--	-	120	1
...HORMOGONALES										
...NOSTOCACEAE										
...ANABAENOPSIS	--	-	* 0		--	-	--	-	--	-
...APHANIZOMENON	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE										
...LYNGBYA	28000	13	9400	4	--	-	--	-	--	-
...OSCILLATORIA	170000#	85	230000#	90	--	-	--	-	--	-
...SPIRULINA	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
...CRYPTOCHRYSIDACEAE										
...CHROOMONAS	--	-	--	-	--	-	66	2	--	-
...CRYPTOMONODACEAE	--	-	--	-	* 0		--	-	--	-
...CRYPTOMONAS										
..EUGLENOPHYCEAE										
...EUGLENALES										
...EUGLENACEAE	--	-	* 0		* 0		--	-	--	-
...EUGLENA	--	-	--	-	--	-	--	-	--	-
...TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...GYMNODINIALES										
...GYMNODINIACEAE										
...GYMNODINIUM	--	-	--	-	--	-	--	-	--	-
...PERIDINIALES										
...GLENODINIACEAE	--	-	--	-	--	-	--	-	--	-
...GLENODINIUM	--	-	--	-	--	-	--	-	--	-
...PERIDINIACEAE	--	-	--	-	--	-	--	-	--	-
...PERIDINIUM	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM; MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO AUGUST 1977

DATE TIME	MAY 19,77 1400	JUN 30,77 0645	JUL 28,77 0900	AUG 24,77 0745
TOTAL CELLS/ML	34000	930	2900	15000
DIVERSITY: DIVISION	0.8	2.1	1.4	1.0
..CLASS	0.8	2.1	1.4	1.0
...ORDER	0.9	2.6	1.8	1.0
...FAMILY	0.9	2.8	2.4	1.7
...GENUS	1.0	2.8	2.4	1.7

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)								
..CHLOROPHYCEAE								
...CHLOROCOCCALES	--	-	--	-	--	-	--	-
...CHARACIACEAE	--	-	--	-	--	-	--	-
...SCHROEDERIA	--	-	--	-	--	-	--	-
...COELASTRACEAE	--	-	--	-	--	-	--	-
...COELASTRUM	--	-	--	-	110	4	--	-
...OOCYSTACEAE	--	-	--	-	--	-	--	-
...ANKISTRODESMUS	--	-	--	-	--	-	--	-
...DICTYOSPHAERIUM	--	-	--	-	--	-	--	-
...KIRCHNERIELLA	1400	4	--	-	--	-	--	-
...OOCYSTIS	890	3	200#	22	--	-	--	-
...TREUBARIA	--	-	--	-	--	-	--	-
...SCENEDESMACEAE	--	-	--	-	--	-	--	-
...SCENEDESMUS	--	-	--	-	--	-	--	-
...OEDOGONIALES	--	-	--	-	--	-	--	-
...OEDOGONIAEAE	--	-	--	-	--	-	--	-
...OEDOGONIUM	--	-	--	-	--	-	--	-
...VOLVOCALES	--	-	--	-	--	-	--	-
...CHLAMYDOMONADACEAE	--	-	--	-	--	-	--	-
...CARTERIA	--	-	48	5	56	2	--	-
...CHLAMYDOMONAS	--	-	--	-	70	2	--	-
...CHLOROGONIUM	--	-	--	-	--	-	--	-
CHRYSTOPHYTA								
..BACILLARIOPHYCEAE								
..CENTRALES								
...CHAETOCERACEAE								
...CHAETOCEROS	--	-	48	5	1100#	39	4700#	32
...COSCINODISCEAE								
...CYCLOTELLA	29000#	84	14	1	28	1	4800#	33
...MELOSIRA	--	-	--	-	--	-	--	-
...PENNALES	--	-	--	-	--	-	--	-
...CYMBELLACEAE	--	-	--	-	--	-	--	-
...CYMBELLA	--	-	--	-	--	-	--	-
...FRAGILARIACEAE	--	-	--	-	--	-	--	-
...SYNEDRA	--	-	--	-	42	1	--	-
...NAVICULACEAE	--	-	--	-	7	1	--	-
...GYROSIGMA	--	-	7	1	28	1	--	-
...NAVICULA	* 0		280#	30	--	-	--	-
...PLEUROSIGMA	--	-	--	-	--	-	--	-
...NITZSCHIAEAE	--	-	--	-	--	-	--	-
...NITZSCHIA	* 0		14	1	110	4	--	-
..CHRYSTOPHYCEAE								
...CHRYSOMONADALES								
...MALLOMONADACEAE								
...MALLOMONAS	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)								
..CYANOPHYCEAE								
...CHROCCOCCALES								
...CHROCCOCCAEAE								
...AGMENELLUM	1300	4	--	-	--	-	--	-
...ANACYSTIS	--	-	--	-	--	-	--	-
...HORMOGONALES	--	-	--	-	--	-	--	-
...NOSTOCACEAE	--	-	--	-	--	-	--	-
...ANABAENOPSIS	--	-	--	-	--	-	--	-
...APHANIZOMENON	--	-	--	-	700#	24	5100#	35
...OSCILLATORIAEAE	--	-	--	-	--	-	--	-
...LYNGBYA	--	-	--	-	--	-	--	-
...OSCILLATORIA	1200	4	130	14	560#	20	--	-
...SPIRULINA	* 0		--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)								
..CRYPTOPHYCEAE								
...CRYPTOMONIDALES								
...CRYPTOCHRYSIDACEAE								
...CHROOMONAS	--	-	95	10	--	-	* 0	
...CRYPTOMONODACEAE	--	-	--	-	--	-	--	-
...CRYPTOMONAS	--	-	--	-	--	-	--	-
..EUGLENOPHYCEAE								
...EUGLENALES								
...EUGLENACEAE								
...EUGLENA	--	-	--	-	28	1	--	-
...TRACHELOMONAS	--	-	--	-	* 0		--	-
PYRRHOPHYTA (FIRE ALGAE)								
..DINOPHYCEAE								
...GYMNODINIALES								
...GYMNODINIAEAE								
...PERIDINIAEAE	--	-	20	2	--	-	--	-
...PERIDINIUM	--	-	--	-	--	-	--	-
...GLENODINIAEAE								
...GLENODINIUM	240	1	7	1	--	-	* 0	
...PERIDINIAEAE	--	-	--	-	--	-	--	-
...PERIDINIUM	--	-	68	7	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## 08407500 PECOS RIVER AT RED BLUFF, NM.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16000	20700	13400	16300	15000	21700	20000	18200	28300	20200	36800	43200
2	16300	21200	13400	17100	15100	24100	18100	19100	28700	21200	37900	43200
3	17000	17400	12400	17900	15400	24100	18600	20400	29200	21300	37700	43300
4	18000	17400	12400	17300	15300	22200	18900	21200	29400	22000	38000	43900
5	20000	16500	11500	17300	14800	21500	18700	22500	29400	21900	38600	44300
6	21400	15700	11500	17200	14700	23000	18900	24600	30100	23100	38900	43700
7	22300	14800	11400	17300	14700	17200	18100	25500	30100	24100	39300	35100
8	22600	15100	11400	17600	14600	16800	18400	25300	30500	24900	40700	34200
9	21400	15600	11400	17700	14400	17000	19500	24800	31300	27600	40900	37000
10	21400	15700	11400	18100	14700	14600	19400	24300	31900	29100	41500	39800
11	20900	15000	11100	17400	15200	14900	18800	24600	31500	31200	42000	39800
12	20900	15400	11100	17400	15000	14800	19600	24800	31300	32900	42200	40000
13	21300	15300	12100	16400	15000	14400	19900	25100	31400	33500	41900	40600
14	21300	14000	12300	16900	15000	14400	20000	25900	31400	34100	41700	40900
15	21800	13900	11600	16900	15700	14400	19900	25900	31100	32500	42200	40600
16	21800	14700	11400	14800	15000	17100	20200	26200	31400	33000	42000	40300
17	22500	13900	11500	14100	14600	16800	19600	25500	32100	33700	42400	41300
18	22700	13600	11900	13700	14700	16800	20700	26100	32500	34100	42400	42100
19	24600	13700	12300	13700	14900	15700	20700	26200	32900	34000	42700	42300
20	25400	12100	13600	13600	15000	15300	21300	26200	28500	33900	43100	42600
21	25800	11900	14200	13600	15000	15300	19900	27100	27500	33800	33200	43200
22	26000	11900	14300	13200	15000	16100	19000	27300	17700	34200	39600	43000
23	26000	12400	15100	13200	15000	17400	17600	27800	15100	34100	42000	43300
24	24600	12800	15800	13600	15100	18100	18000	28200	13200	34900	42400	44400
25	24600	12800	15700	13600	15700	18200	16200	29300	14300	34900	42600	44300
26	25500	13700	15600	13800	16300	19700	16400	30100	15800	35700	13600	44300
27	25200	13200	15800	13700	16600	19700	16900	29500	17500	35800	38700	44400
28	24800	13200	16100	14300	21700	19500	16800	29500	17500	36500	40700	44600
29	25600	12600	16000	14400	---	22500	17200	29300	18400	37400	41500	44800
30	23300	12600	16600	15000	---	23500	17800	29200	20100	34000	42200	45000
31	21900	---	16400	15000	---	22100	---	29300	---	35700	42100	---
MEAN	22400	14600	13200	15600	15300	18400	18800	25800	26300	30800	39700	42000

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22.0	14.5	4.0	5.0	7.0	10.5	18.0	25.5	27.5	29.0	31.0	28.0
2	22.0	15.0	5.0	5.0	7.0	11.0	18.5	25.5	28.5	29.5	29.5	28.0
3	23.5	15.0	5.0	5.5	8.0	11.0	17.0	23.5	28.5	28.0	29.5	28.0
4	22.0	15.0	5.5	5.0	8.5	11.0	16.5	24.5	26.0	28.0	29.5	29.0
5	22.0	15.0	7.0	5.0	9.0	8.0	16.5	25.0	29.5	28.5	27.5	29.0
6	22.0	15.5	7.0	5.5	9.0	10.0	18.0	25.0	29.0	29.5	28.5	29.0
7	18.0	14.0	7.0	5.5	9.0	10.5	19.0	26.5	26.0	30.0	28.5	29.5
8	17.0	13.0	7.0	6.0	10.0	11.5	19.5	27.0	27.0	27.0	30.0	30.0
9	17.0	13.5	7.5	5.0	10.0	12.0	19.5	25.5	28.0	27.0	30.5	27.0
10	17.5	13.5	7.0	4.5	9.5	13.5	19.5	25.0	28.0	30.5	29.0	27.0
11	18.5	13.5	6.5	4.0	11.0	14.0	20.0	24.5	29.0	31.0	29.5	26.0
12	18.5	8.0	6.0	4.5	11.0	14.0	21.5	23.5	28.5	29.0	29.5	27.0
13	18.5	7.0	5.5	5.0	11.0	14.0	20.5	24.0	28.5	29.0	29.0	28.0
14	18.5	6.5	5.5	5.0	10.0	14.5	20.0	24.5	28.5	30.0	29.0	26.5
15	18.5	7.0	7.0	5.5	11.0	14.5	21.5	24.5	30.0	30.0	29.0	25.0
16	18.5	7.0	7.0	5.0	11.5	13.5	21.0	25.5	31.0	30.0	30.0	25.5
17	17.0	6.5	7.0	5.0	12.5	14.0	22.0	25.0	31.0	30.0	30.0	27.0
18	18.0	7.5	7.0	5.5	13.5	14.0	22.0	25.0	30.0	30.0	30.0	26.0
19	17.0	7.5	7.5	6.0	13.5	15.0	22.0	25.0	30.0	30.0	30.0	26.0
20	15.0	11.0	7.5	6.0	13.5	15.5	23.0	25.5	28.5	30.0	30.0	27.0
21	15.0	11.5	6.5	6.5	13.5	16.0	22.5	25.0	26.5	30.0	29.0	27.0
22	15.0	11.0	6.0	7.5	13.0	15.0	22.5	27.0	28.5	26.0	30.5	26.0
23	17.0	11.0	5.5	7.5	12.5	15.0	22.5	24.0	28.5	27.5	31.0	27.0
24	16.0	11.5	6.0	8.0	13.0	16.0	23.0	23.0	31.5	29.5	31.0	27.0
25	16.0	11.5	5.5	8.0	14.0	15.5	23.5	23.0	32.0	30.0	29.0	27.0
26	18.0	12.0	5.0	10.0	12.0	15.5	24.0	24.0	32.0	30.0	25.0	27.0
27	12.0	9.5	6.0	10.5	11.0	15.5	24.5	25.5	31.5	28.0	28.0	27.0
28	11.0	6.5	6.5	10.0	11.0	15.0	24.5	26.0	31.5	29.0	28.0	25.5
29	11.0	5.0	6.5	7.5	---	15.0	24.5	26.5	30.5	29.5	30.0	27.0
30	12.5	5.5	7.0	7.5	---	16.0	25.5	27.5	30.5	31.0	27.5	26.0
31	13.0	---	6.0	7.0	---	17.0	---	28.0	---	30.0	27.5	---
MEAN	17.5	10.5	6.5	6.0	11.0	13.5	21.0	25.0	29.0	29.0	29.0	27.0

## 08408500 DELAWARE RIVER NEAR RED BLUFF, NM

LOCATION.--Lat 32°01'23", long 104°03'15", in NE¼SW¼SE¼ sec. 23, T.26 S., R.28 E., Eddy County, Hydrologic Unit 13070002, near center of channel on downstream side of pier of bridge on U.S. Highway 285, 2.1 mi (3.4 km) northwest of the New Mexico-Texas State line, 3.6 mi (5.8 km) southwest of Red Bluff, 3.7 mi (6.0 km) upstream from mouth, 14 mi (23 km) south of Malaga, and 405.6 mi (652.6 km) upstream from mouth.

DRAINAGE AREA.--689 mi<sup>2</sup> (1,785 km<sup>2</sup>).

PERIOD OF RECORD.--April 1912 to September 1913, May 1914 to June 1915, October 1937 to current year. Published as "near Malaga, N. Mex." 1912-13 and as "near Angeles, Tex." 1914-15.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 2,900.66 ft (884.121 m) above mean sea level. Prior to May 1914, at site 3.0 mi (4.8 km) upstream at different datum. May 1914 to June 1915 at site 2.5 mi (4.0 km) downstream at different datum.

REMARKS.--Records fair. One small upstream diversion. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--40 years (water years 1938-77), 13.1 ft<sup>3</sup>/s (0.371 m<sup>3</sup>/s), 9,490 acre-ft/yr (11.7 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 81,400 ft<sup>3</sup>/s (2,310 m<sup>3</sup>/s) Oct. 2, 1955, gage height, 27.0 ft (8.23 m), from floodmark, from rating curve extended above 1,500 ft<sup>3</sup>/s (42.5 m<sup>3</sup>/s) on basis of slope-area measurements at gage heights 8.65, 12.84, 18.00, and 27.0 ft (2.637, 3.914, 5.486, and 8.230 m); no flow for most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1911, that of Oct. 2, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 740 ft<sup>3</sup>/s (21.0 m<sup>3</sup>/s) June 23, gage height, 4.63 ft (1.411 m), no peak above base of 1,700 ft<sup>3</sup>/s (48.1 m<sup>3</sup>/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	2.3	2.9	3.0	2.9	2.8	2.5	1.9	.46	.20	.00	.00
2	1.8	2.3	2.9	3.1	3.0	2.9	2.4	1.7	.40	.09	.00	.00
3	1.9	2.3	3.0	3.2	3.2	2.9	2.3	1.6	.28	.02	.00	.00
4	1.7	2.3	3.0	3.2	3.0	2.9	2.2	1.5	.18	.00	.00	.00
5	1.4	2.3	3.0	3.2	3.0	2.9	2.4	1.5	.10	.00	.00	.00
6	1.4	2.3	2.9	3.1	3.0	3.0	2.5	1.3	.06	.00	.00	.00
7	1.3	2.2	2.9	3.0	2.9	3.0	2.5	1.3	.02	.00	.00	.00
8	1.3	2.2	2.9	3.4	3.0	3.2	2.4	1.2	.00	12	.00	.00
9	1.4	2.2	3.0	3.6	3.2	3.0	2.4	1.1	.00	15	.00	.00
10	1.5	2.3	3.0	3.5	3.2	2.8	2.3	3.3	.00	2.4	.00	.00
11	1.5	2.3	3.0	3.6	3.2	2.7	2.4	1.6	.00	.78	.00	.00
12	1.5	2.6	3.0	3.7	3.2	2.7	2.4	1.3	.00	.27	.00	17
13	1.5	3.1	3.0	3.6	3.2	2.6	2.4	18	.00	.05	.00	1.9
14	1.6	3.3	3.0	3.4	3.1	2.5	16	7.1	.00	.00	.00	.48
15	1.8	3.7	3.0	3.3	3.1	2.4	16	2.1	.00	.00	.00	.12
16	1.9	3.7	3.0	3.2	3.1	2.5	5.0	1.2	.00	.00	.00	.02
17	1.7	3.2	3.0	3.0	3.1	2.5	4.0	.95	.00	.00	.00	.21
18	1.7	3.0	3.0	3.0	3.1	2.5	3.3	.88	.00	.00	.00	.10
19	1.5	3.0	3.1	3.0	3.1	2.4	2.8	.74	.00	.00	.00	.01
20	1.5	2.9	3.0	3.0	3.1	2.5	2.6	.67	.00	.00	.00	.00
21	1.6	2.8	3.0	3.0	3.0	2.4	2.4	.60	.00	.00	.00	.00
22	1.8	2.7	2.9	3.0	2.9	2.4	2.3	.56	16	.00	.00	.00
23	1.9	2.7	2.9	3.1	2.9	2.5	2.3	.56	139	.00	20	.00
24	1.8	2.7	2.9	3.0	3.0	2.6	2.3	22	11	.00	7.1	.00
25	1.8	2.7	3.0	3.0	3.0	2.7	2.2	8.7	3.2	.00	2.8	.00
26	1.8	2.6	3.2	3.0	2.9	2.8	2.2	2.5	1.8	.00	2.1	.00
27	1.8	2.4	3.2	3.0	2.9	3.1	2.1	1.5	1.2	.00	.53	.00
28	2.9	2.4	3.1	2.9	2.9	2.9	2.0	1.2	.83	.00	.08	.00
29	4.1	2.5	3.1	2.8	---	2.8	2.1	.91	.50	.15	.02	.00
30	3.2	2.7	3.2	2.7	---	2.7	2.2	.68	.34	.48	.00	.00
31	2.5	---	3.0	2.8	---	2.6	---	.56	---	.04	.00	---
TOTAL	56.5	79.7	93.1	97.4	85.2	84.2	102.9	90.71	175.37	31.48	32.63	19.84
MEAN	1.82	2.66	3.00	3.14	3.04	2.72	3.43	2.93	5.85	1.02	1.05	.66
MAX	4.1	3.7	3.2	3.7	3.2	3.2	16	22	139	15	20	17
MIN	1.3	2.2	2.9	2.7	2.9	2.4	2.0	.56	.00	.00	.00	.00
AC-FT	112	158	185	193	169	167	204	180	348	62	65	39

CAL YR 1976 TOTAL 1705.57 MEAN 4.66 MAX 200 MIN .00 AC-FT 3380  
WTR YR 1977 TOTAL 949.03 MEAN 2.60 MAX 139 MIN .00 AC-FT 1880



## 08410000 RED BLUFF RESERVOIR NEAR ORLA, TX

LOCATION.--Lat 31°54'06", long 103°54'42", Reeves County, Hydrologic Unit 13070001, at right end of Red Bluff Dam on the Pecos River, 3 mi (5 km) upstream from Salt Creek, and 4.5 mi (7.2 km) north of Orla.

DRAINAGE AREA.--20,720 mi<sup>2</sup> (53,660 km<sup>2</sup>), approximately (contributing area).

PERIOD OF RECORD.--February 1937 to current year. Monthly contents only for some periods, published in WSP 1312.

GAGE.--Nonrecording gage. Datum of gage is 0.43 ft (0.131 m) below mean sea level.

REMARKS.--The reservoir is formed by a rock-faced earthfill dam 9,200 ft (2,800 m) long. The dam was completed and storage began in September 1936. The dam and reservoir are owned and operated by the Red Bluff Water Power Control District. The water is used for power development and for irrigation from Mentone to Grandfalls. The uncontrolled spillway is a cut through natural ground located to the right of right end of dam and is 790 ft (241 m) wide. The controlled spillway is equipped with 12 tainter gates that are 25 by 15 ft (8 by 5 m) high. Inflow is partly regulated by storage in Lake Summer, Lake McMillan, and Lake Avalon (total combined capacity, 154,400 acre-ft or 190 hm<sup>3</sup>), and by several small diversion dams that divert water for power or irrigation. The capacity curve is based on Geological Survey topographic map, survey of 1925. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam.....	2,856.0	-
Crest of spillway.....	2,845.0	340,000
Top of gates (top of conservation pool).....	2,842.0	310,000
Crest of spillway.....	2,827.0	166,500
Lowest gated outlet (invert).....	2,764.0	3,000

COOPERATION.--Gage-height records and capacity curve furnished by Red Bluff Water Power and Control District.

EXTREMES (at 0800) FOR PERIOD OF RECORD.--Maximum contents observed, 352,000 acre-ft (434 hm<sup>3</sup>) Sept. 27, 28, 1941, gage height, 2,846.2 ft (867.52 m), observed on nonrecording gage at service spillway (affected by variable drawdown due to flow through tainter gates); minimum observed, 11,080 acre-ft (13.7 hm<sup>3</sup>) May 13, 1948, gage height, 2,781.4 ft (847.77 m).

EXTREMES (at 0800) FOR CURRENT YEAR.--Maximum contents observed, 70,700 acre-ft (87.2 hm<sup>3</sup>) Feb. 12 to Mar. 1, gage height, 2,809.8 ft (856.43 m); minimum observed, 21,100 acre-ft (26.0 hm<sup>3</sup>) Sept. 27-30, gage height, 2,790.5 ft (850.54 m).

Capacity table (gage height, in feet, and total contents, in acre-feet)

2,790.0	20,400	2,803.0	47,000
2,796.0	30,300	2,810.0	71,500

CONTENTS, IN ACRE-FEET, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
INSTANTANEOUS OBSERVATIONS AT 0800

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66700	66300	67500	68700	70300	70700	62800	61750	51200	48200	38040	24330
2	66700	66300	67500	68700	70300	70300	62800	61750	50900	47900	37320	23570
3	66700	66700	67500	68700	70300	69500	62800	61750	50900	47300	36600	23000
4	66700	66700	67500	68700	70300	69100	62800	61400	50900	46700	35940	22640
5	66700	66700	67500	68700	70300	68300	62800	61400	50900	46400	35500	22640
6	66700	66700	67500	68700	70300	67900	62800	61050	50900	45800	34620	22760
7	66700	66700	67900	68700	70300	67500	62800	61050	50600	45200	34400	22640
8	66700	66300	67900	68700	70300	66700	62800	61050	50600	44600	33560	22520
9	66700	66300	67900	68700	70300	65900	62450	60700	50300	44300	33140	22520
10	66300	66300	67900	69100	70300	65100	62450	60700	50300	44300	33140	22400
11	66300	66300	67900	69100	70300	64300	62450	60000	50000	44300	33140	22400
12	66700	66300	67900	69100	70700	63900	62450	59650	50000	44300	33140	22280
13	66300	66300	68300	69100	70700	63500	62100	58950	50000	44300	33140	22280
14	66300	66300	68300	69100	70700	63150	62450	58250	49700	44300	33140	22160
15	66300	66300	68300	69500	70700	63150	62100	57550	49700	44300	32930	22040
16	66300	66300	68300	69500	70700	63150	62100	56850	49400	44000	32930	21920
17	66300	66300	68300	69500	70700	63150	62100	56150	49400	44000	32720	21920
18	66300	66300	68300	69500	70700	63150	61750	55100	49100	44000	32300	21800
19	66300	66700	68300	69500	70700	62800	61750	54750	49100	43750	31700	21800
20	66300	66700	68700	69500	70700	62800	61750	54050	48800	43750	31300	21660
21	66300	66700	68700	69500	70700	62800	61750	53350	48800	43500	30500	21660
22	66300	66700	68700	69900	70700	62800	61750	53000	48800	43500	30300	21520
23	66300	66700	68700	69900	70700	62800	61750	52100	48800	43500	29730	21520
24	66300	66700	68700	69900	70700	62800	61750	51500	49700	42750	29160	21380
25	66300	67100	68700	69900	70700	62800	61750	50900	49700	42250	28590	21240
26	66300	67100	68700	69900	70700	62800	61750	50900	49700	41750	28220	21240
27	66300	67100	68700	69900	70700	62800	61750	51200	49700	41000	27680	21100
28	66300	67100	68700	69900	70700	62800	61750	51200	49400	40250	27140	21100
29	66300	67100	68700	69900	---	62800	61750	51200	49100	39000	26600	21100
30	66300	67100	68700	69900	---	62800	61750	51200	48500	39000	26090	21100
31	66300	---	68700	70300	---	62800	---	51200	---	38520	25580	---
(+)	2808.7	2808.9	2809.3	2809.7	2809.8	2807.8	2807.5	2804.4	2803.5	2799.8	2793.4	2790.5
(-)	-400	+800	+1600	+1600	+400	-7900	-1050	-10550	-2700	-9980	-12940	-4480
MAX	66700	67100	68700	70300	70700	70700	62800	61750	51200	48200	38040	24330
MIN	66300	66300	67500	68700	70300	62800	61750	50900	48500	38520	25580	21100
CAL YR 1976	MAX	116200	MIN	59300	+	-46900						
WTR YR 1977	MAX	70700	MIN	21100	+	-45600						

+ Gage height, in feet, at end of month.

+ Change in contents, in acre-feet.



## RIO GRANDE BASIN

08412500 PECOS RIVER NEAR ORLA, TX

LOCATION.--Lat 31°52'21", long 103°49'52", Reeves County, Hydrologic Unit 13070001, on right bank at bridge on Farm Road 652, 5.5 mi (8.8 km) downstream from Salt Creek (Screw Bean Arroyo), 5.9 mi (9.5 km) northeast of Orla, and 8.5 mi (13.7 km) downstream from Red Bluff Reservoir.

DRAINAGE AREA.--21,210 mi<sup>2</sup> (54,930 km<sup>2</sup>), approximately (contributing area).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1937 to current year.

REVISED RECORDS.--WSP 928: 1937.

GAGE.--Water-stage recorder. Datum of gage is 2,730.86 ft (832.366 m) above mean sea level. Prior to Nov. 16, 1969, at site 6.9 mi (11.1 km) downstream at datum 12.81 ft (3.904 m) lower.

REMARKS.--Water-discharge records fair. Most of flow is release from storage in Red Bluff Reservoir (station 08410000). Occasional runoff from draws between dam and station. Many diversions above Red Bluff Reservoir for irrigation.

AVERAGE DISCHARGE.--40 years (water years 1938-77), 176 ft<sup>3</sup>/s (4.984 m<sup>3</sup>/s), 127,500 acre-ft/yr (157 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,700 ft<sup>3</sup>/s (671 m<sup>3</sup>/s) Sept. 29, 1941, gage height, 20.74 ft (6.322 m), site and datum then in use; no flow at times in 1946 and 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 611 ft<sup>3</sup>/s (17.3 m<sup>3</sup>/s) Apr. 14, gage height, 5.11 ft (1.558 m); minimum, 4.0 ft<sup>3</sup>/s (0.11 m<sup>3</sup>/s) July 15, 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	26	18	12	9.2	96	10	9.2	7.1	200	289	255
2	18	58	19	12	9.2	322	11	8.7	5.9	200	284	254
3	19	59	19	12	9.2	328	11	8.1	5.0	200	277	248
4	19	59	18	12	9.2	336	17	9.3	4.7	207	274	54
5	16	59	17	12	9.2	335	34	51	4.3	206	273	39
6	15	58	16	12	9.0	334	40	50	28	207	273	38
7	15	58	16	12	8.6	335	39	41	33	207	272	38
8	15	58	16	12	8.6	335	38	12	32	150	271	39
9	15	58	16	12	8.6	334	37	53	32	16	202	39
10	15	58	16	12	8.0	333	36	138	32	14	54	38
11	15	58	16	12	9.7	331	38	278	32	8.8	19	37
12	15	57	16	13	10	333	16	307	33	6.3	12	38
13	15	57	15	14	11	310	53	303	34	5.4	32	36
14	15	53	15	14	12	58	242	300	34	4.7	35	37
15	15	21	15	13	9.7	45	81	292	34	4.3	35	38
16	16	21	15	12	8.8	45	63	298	33	4.4	36	38
17	16	20	15	11	8.5	50	59	296	36	4.7	45	39
18	16	19	14	11	7.9	13	62	296	38	4.7	242	39
19	15	18	14	11	7.5	12	56	294	38	43	250	39
20	15	18	19	10	7.5	11	14	293	34	45	250	39
21	15	17	19	10	7.5	9.7	11	294	26	47	243	39
22	15	16	17	10	8.1	10	10	295	26	47	151	39
23	15	16	17	10	7.8	9.7	9.6	293	27	117	251	39
24	15	16	14	10	8.1	9.2	9.2	294	184	289	250	39
25	15	16	14	10	7.6	9.7	9.2	194	50	291	248	41
26	15	17	14	10	7.5	9.5	9.2	9.8	40	290	249	40
27	15	18	12	10	8.1	11	8.7	7.9	34	288	247	40
28	17	18	12	9.8	9.1	12	8.6	7.3	45	289	246	36
29	25	18	12	9.2	---	13	9.2	6.5	225	289	246	13
30	27	18	12	9.2	---	12	9.2	5.6	199	297	259	11
31	21	---	12	9.2	---	10	---	5.5	---	290	258	---
TOTAL	512	1063	480	348.4	245.2	4411.8	1050.9	4749.9	1386.0	4272.3	6073	1759
MEAN	16.5	35.4	15.5	11.2	8.76	142	35.0	153	46.2	138	196	58.6
MAX	27	59	19	14	12	336	242	307	225	297	289	255
MIN	15	16	12	9.2	7.5	9.2	8.6	5.5	4.3	4.3	12	11
AC-FT	1020	2110	952	691	486	8750	2080	9420	2750	8470	12050	3490
CAL YR 1976	TOTAL	34752.3	MEAN	95.0	MAX	2000	MIN	8.1	AC-FT	68930		
WTR YR 1977	TOTAL	26351.5	MEAN	72.2	MAX	336	MIN	4.3	AC-FT	52270		

## RIO GRANDE BASIN

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08412500 PECOS RIVER NEAR ORLA, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: July 1937 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1937 to current year.

WATER TEMPERATURES: March 1953 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 29,100 micromhos Sept. 2, 1969, July 22, 1972; minimum daily, 1,610 micromhos June 2, 1948.

WATER TEMPERATURES (1953-61, 1968-77): Maximum daily, 29.5°C Aug. 23, 1977; minimum daily, 0.5°C Jan. 6, 1971, Jan. 11, 1973.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 24,100 micromhos Oct. 30, Feb. 26, 27; minimum daily, 10,500 micromhos Apr. 15.

WATER TEMPERATURES: Maximum daily, 29.5°C Aug. 23; minimum daily, 1.5°C Jan. 10.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

		INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)
DATE	TIME								
OCT 07...	1115	14	21500	7.5	16.0	3600	3400	860	350
JAN 06...	1025	12	22800	7.8	3.0	3900	3700	920	380
FEB 16...	1215	9.3	23400	7.7	11.0	3900	3700	940	370
APR 16...	0830	70	11000	7.3	14.5	1900	1800	480	180
MAY 11...	1135	279	12400	7.3	20.0	1700	1600	500	120
JUN 29...	0915	266	13500	7.2	24.0	2100	1900	560	160
JUL 08...	0800	200	13200	7.3	24.5	2300	2200	560	230
AUG 10...	1220	113	14100	7.2	26.5	2600	2500	620	250
SEP 13...	1120	36	15500	7.2	23.0	3600	3500	990	270
		SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)
DATE		DIS- SOLVED SODIUM (NA) (MG/L)							
OCT 07...	4000	29	52	195	0	2900	6500	8.2	14800
JAN 06...	4000	28	48	169	0	2900	7000	7.2	15300
FEB 16...	4300	30	46	164	0	3000	7200	2.7	15900
APR 16...	1700	17	54	130	0	1700	2900	4.5	7080
MAY 11...	2100	22	64	150	0	1700	3200	5.3	7760
JUN 29...	2300	22	77	140	0	2600	3000	9.1	8780
JUL 08...	2200	20	76	130	0	2000	3600	8.3	8740
AUG 10...	2500	21	81	130	0	2100	4000	11	9630
SEP 13...	2600	19	84	140	0	3000	4400	12	11400

## RIO GRANDE BASIN

08412500 PECOS RIVER NEAR ORLA, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	512	21800	15000	20800	6570	9080	3000	4150	****
NOV. 1976.....	1063	16200	10900	31300	4590	13200	2350	6750	****
DEC. 1976.....	480	22000	15200	19700	6660	8620	3030	3930	****
JAN. 1977.....	348.4	22800	15700	14800	6940	6530	3120	2930	****
FEB. 1977.....	245.2	23300	16100	10700	7150	4730	3180	2110	****
MAR. 1977.....	4411.8	11900	7820	93100	3200	38100	1860	22100	****
APR. 1977.....	1050.9	15100	10200	28800	4220	12000	2230	6330	****
MAY 1977.....	4749.89	12600	8350	107000	3400	43700	1940	24900	****
JUNE 1977.....	1385	13500	9010	33700	3680	13800	2050	7670	****
JULY 1977.....	4272.3	13400	8950	103000	3650	42100	2040	23500	****
AUG. 1977.....	6073	14000	9340	153000	3810	62500	2100	34500	****
SEPT 1977.....	1759	15100	10200	48400	4160	19800	2230	10600	****
TOTAL .....	26351.47	**	**	664000	**	274000	**	149000	**
WTD.AVG. ....	72.2	14000	9300	**	3900	**	2100	**	*****

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20900	22700	21900	22800	22900	23400	21500	21600	19500	13300	13600	14500
2	20800	12600	22400	22800	23100	11200	21400	22100	19900	13200	13600	14500
3	20800	12200	22700	22600	23100	11200	21900	22200	20700	13200	13600	14900
4	21500	12900	22600	22500	23100	11200	22300	21900	20200	13200	13600	15100
5	22000	13500	22500	22200	23300	11300	14200	13900	20200	13200	13600	14500
6	21700	13900	22500	22700	23300	11300	14500	13500	20200	13100	13700	14900
7	21600	14600	22500	21900	23300	11300	13700	13500	13700	13100	13700	15000
8	21500	14500	22500	22800	23100	11300	13900	14100	13700	13100	13700	15100
9	21500	14400	22300	22700	23100	11300	13700	13300	13700	13600	13700	15100
10	21500	14400	22100	22200	23100	11400	14700	14300	13700	13600	14300	15300
11	21300	14400	22200	22700	23100	11300	15000	12300	13700	13700	11600	15400
12	21400	13300	22100	22900	23100	11300	15000	12800	13600	13800	12100	15500
13	21400	13800	22300	22900	23300	11300	14200	12700	13700	13800	13900	15500
14	21300	14700	22300	22800	23500	12200	18300	12600	13600	13900	14100	15600
15	21200	15600	22600	23100	23500	12600	10500	12500	13900	13900	14100	15700
16	21200	22600	22600	23100	23200	12600	11200	12300	13800	13900	15100	15600
17	21800	23400	22700	23900	23100	12300	11500	12200	13600	13900	13500	15200
18	22800	22900	22800	23600	23200	12900	12000	12200	13500	13900	14000	15500
19	22300	22800	22600	22900	23300	16700	12200	12200	13500	13400	13900	15900
20	22000	22800	22700	22700	23200	18400	12400	12200	13400	13400	14100	15800
21	22000	22500	19600	22700	23300	19100	15300	12300	13600	13400	14100	15800
22	21900	22000	19000	22800	23500	19100	17400	12300	13900	13400	14300	15800
23	21700	21700	19900	22700	23500	19400	19100	12300	13900	13500	14100	15900
24	22000	21700	20100	22800	23800	14900	20000	12300	11100	13500	14100	15800
25	22200	21500	21900	22800	23800	19800	19100	12500	13400	13600	14200	15900
26	22100	21900	22100	23100	24100	19800	18700	13000	13400	13600	14300	15800
27	22100	21600	22300	23100	24100	19800	19800	14900	13400	13500	14300	16100
28	21600	21900	22300	22900	23500	20200	20400	17900	14300	13600	14300	15900
29	20500	22000	22500	22900	---	21400	21000	18700	13400	13600	14300	16200
30	24100	22000	22500	22900	---	22700	21400	19200	13500	13700	14400	15700
31	23800	---	22300	21300	---	22000	---	19300	---	13600	14400	---
MEAN	21800	18400	22000	22800	23300	15300	16500	14800	14900	13500	13900	15500

## RIO GRANDE BASIN

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08412500 PECOS RIVER NEAR ORLA, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22.0	12.0	3.0	5.0	4.5	8.5	15.0	22.0	24.5	24.5	25.0	26.0
2	20.0	12.0	3.0	5.0	8.5	9.0	14.5	21.5	27.0	27.0	25.0	26.5
3	21.0	12.0	4.0	4.5	7.0	8.5	15.0	22.0	25.0	24.0	25.0	25.0
4	21.0	14.5	3.5	7.0	6.5	8.0	14.0	23.0	25.0	24.0	25.0	25.0
5	19.5	12.0	5.0	8.5	7.0	8.5	13.5	20.0	23.5	24.5	24.5	25.0
6	18.5	11.5	6.0	4.5	7.0	---	14.0	17.0	24.5	24.5	24.5	25.5
7	17.0	12.0	5.0	5.0	10.0	7.0	14.5	19.5	24.5	25.0	27.0	25.0
8	13.5	11.0	5.0	6.0	9.5	6.5	15.0	25.0	23.5	24.5	24.5	24.5
9	14.5	11.5	6.0	5.0	9.5	8.5	15.5	20.0	23.5	---	24.5	24.5
10	15.0	11.5	8.0	1.5	10.0	12.0	16.0	21.0	24.5	---	25.0	24.5
11	15.5	12.0	6.0	2.0	9.5	10.0	16.0	18.5	25.0	---	24.5	24.5
12	16.0	11.0	6.5	4.0	10.0	9.5	18.5	20.0	25.0	---	25.0	23.5
13	---	---	7.0	4.5	9.5	9.0	18.5	20.0	24.5	---	25.0	23.5
14	18.5	5.5	6.0	4.0	9.5	13.5	15.5	21.0	26.0	---	27.0	23.0
15	17.0	7.0	6.0	4.5	11.0	11.0	18.5	20.0	25.0	---	25.5	23.0
16	17.0	8.5	6.0	5.5	9.5	11.0	14.5	20.0	25.5	---	25.5	22.0
17	15.0	7.0	6.0	3.0	9.5	11.0	15.0	20.0	25.0	---	25.5	26.0
18	15.5	7.0	6.5	4.0	10.0	11.0	15.0	20.0	25.5	---	25.0	22.0
19	15.0	9.0	6.5	4.0	10.0	13.0	17.0	20.0	25.0	---	25.0	22.0
20	13.5	12.0	7.0	5.5	11.0	12.0	18.5	22.0	25.0	---	25.5	26.0
21	14.0	11.0	6.5	7.0	10.0	12.0	18.0	20.0	25.0	---	26.0	25.0
22	13.5	9.5	4.0	8.5	11.0	12.0	18.5	19.5	24.5	---	25.5	22.0
23	16.0	9.5	4.0	9.5	10.0	13.0	19.5	20.0	23.5	---	29.5	23.0
24	16.0	9.0	4.0	8.5	10.5	13.5	19.5	20.0	21.0	24.5	25.5	24.0
25	15.0	10.0	6.0	7.0	12.0	14.5	19.5	21.0	24.5	24.5	25.0	23.0
26	15.0	11.0	4.5	9.0	10.0	15.0	20.0	23.5	---	24.5	24.5	22.0
27	14.5	9.5	4.5	9.5	9.5	13.5	20.0	27.0	27.0	25.0	25.5	23.5
28	11.0	---	6.0	9.5	7.0	12.0	21.0	21.0	26.0	27.0	25.0	22.0
29	9.5	3.0	5.5	8.0	---	13.5	20.5	22.0	26.0	25.0	25.5	24.5
30	10.0	2.0	8.5	6.0	---	13.0	21.0	22.0	24.5	25.0	---	23.5
31	11.5	---	5.5	6.5	---	14.0	---	24.5	---	24.5	24.5	---
MEAN	15.5	10.0	5.5	6.0	9.5	11.0	17.0	21.0	25.0	25.0	25.5	24.0

## RIO GRANDE BASIN

08414000 PECOS RIVER NEAR MENTONE, TX  
(Reconnaissance partial-record station)

LOCATION.--Lat 31°40'07", long 103°37'34", Reeves-Loving County line, Hydrologic Unit 13070001, at bridge on State Highway 302 and 3.0 mi (4.8 km) southwest of Mentone.

DRAINAGE AREA.--21,650 mi<sup>2</sup> (56,070 km<sup>2</sup>), approximately (contributing area).

PERIOD OF RECORD.--Occasional discharge measurements: September to December 1968, October 1973 to current year. Operated as a daily discharge station February 1922 to July 1926, December 1968 to June 1973. Occasional water-quality data: September 1968 to September 1977 (discontinued).

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA, MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG/L)
OCT 07...	1305	16	19000	7.8	17.0	3400	3300	830	320
NOV 23...	1200	14	21300	8.0	9.0	3500	3400	790	360
JAN 06...	1135	10	22300	7.6	4.0	3700	3600	920	340
FEB 16...	1355	9.0	22800	7.6	13.0	3800	3700	910	370
MAR 30...	1410	13	18800	7.2	19.0	3100	3000	750	290
MAY 11...	1425	406	13900	7.4	23.0	2300	2200	590	210
JUN 29...	1025	36	14600	7.5	26.5	2400	2300	620	210
AUG 10...	1335	390	14000	7.2	28.0	2500	2400	590	260
DATE	DIS-SOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 07...	3500	26	44	153	0	2700	5800	4.7	13300
NOV 23...	4000	30	60	122	0	2900	6700	.9	14900
JAN 06...	4000	29	43	154	0	2800	6500	1.5	14700
FEB 16...	4400	31	47	125	0	3100	7500	.2	16400
MAR 30...	3400	27	57	130	0	2600	5400	.7	12600
MAY 11...	2400	22	68	180	0	2000	3800	5.6	9160
JUN 29...	2600	23	51	80	0	2100	4100	3.8	9720
AUG 10...	2300	20	85	130	0	2100	3800	9.4	9210

## RIO GRANDE BASIN

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08414500 REEVES COUNTY WATER IMPROVEMENT DISTRICT NO. 2 CANAL NEAR MENTONE, TX

LOCATION.--Lat 31°37'57", Long 103°34'30", Loving County, Hydrologic Unit 13070001, on right bank 173 ft (53 m) downstream from headgate of canal (at Pecos River), 5.3 mi (8.5 km) south of Mentone, and 15 mi (24 km) northwest of Pecos.

PERIOD OF RECORD.--February 1922 to July 1925, August 1939 to May 1941, March 1942 to September 1957, and March 1964 to current year. Records from August 1939 to October 1940, not equivalent because diversion was not included. Published as "Farmers Independent Canal near Porterville" 1922-25.

GAGE.--Water-stage recorder. Concrete weir since Mar. 1, 1964. Altitude of gage is 2,640 ft (805 m), from topographic map. Prior to July 22, 1925, at site 250 ft (76 m) downstream at different datum. Mar. 10, 1939, to Oct. 4, 1940, at site 2.5 mi (4.0 km) downstream at different datum. Oct. 5, 1940, to Feb. 19, 1943, at site 123 ft (37 m) upstream at datum 1.10 ft (0.335 m) higher. Feb. 20, 1943, to Mar. 1, 1954, at site 123 ft (37 m) upstream at present datum.

REMARKS.--Records good. Local runoff is deleted from daily discharge record. Water is diverted from right bank of Pecos River and is used for irrigation between Mentone and Pecos.

AVERAGE DISCHARGE.--31 years (water years 1923-24, 1940, 1943-57, 1966-77), 9.16 ft<sup>3</sup>/s (0.259 m<sup>3</sup>/s), 6,640 acre-ft/yr (8.19 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 160 ft<sup>3</sup>/s (4.53 m<sup>3</sup>/s) June 14, 1922; no flow at times each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	1.3	.14	.44	.00	.00	.25	.02	.02	.02	.07
2	.00	.00	1.2	.14	.44	.00	.00	.25	.02	.02	.02	.07
3	.00	.00	1.2	.14	.44	.00	.00	.13	.02	.02	.02	.07
4	.00	4.8	1.2	.14	.44	.02	.00	.04	.02	.02	.02	.07
5	.00	17	1.2	.14	.42	.07	.00	.00	.02	7.1	.02	.04
6	.00	16	1.2	.14	.42	.07	6.8	.29	.00	21	.02	.02
7	.00	16	1.2	.14	.44	.14	17	.49	.00	7.6	.02	.02
8	.00	16	1.0	.14	.34	.14	16	4.2	.02	.14	.02	.02
9	.00	15	.85	.14	.34	.14	14	8.8	.01	.08	.02	.03
10	.00	15	.85	.14	.34	.14	6.9	8.0	.00	.08	.02	.02
11	.00	15	.85	.14	.45	.24	.70	14	.00	.07	.02	.02
12	.00	15	.85	.14	.28	.14	.60	18	.00	.06	.01	.02
13	.00	14	.85	.14	.00	.00	.49	18	.00	.02	.01	.02
14	.00	14	.85	.14	.00	.00	.49	8.6	.00	.02	.02	.02
15	.00	13	.85	.15	.00	.00	.37	.09	.00	.02	.02	.02
16	.00	11	.70	.22	.00	.00	.34	.07	.00	.00	.02	.02
17	.00	6.8	.70	.24	.00	.00	.34	.03	.00	.00	.02	.02
18	.00	6.1	.70	.24	.00	.00	.34	.02	.00	.00	.02	.02
19	.00	5.0	.70	.23	.00	.00	.34	.02	9.9	.00	.02	.02
20	.00	4.5	.70	.24	.00	.00	.34	2.5	18	.00	6.6	.02
21	.00	4.0	.70	.24	.00	.00	.25	13	17	4.1	18	.02
22	.00	4.2	.56	.24	.00	.00	.24	4.5	16	13	18	.02
23	.00	4.5	.34	.24	.00	.00	.21	.05	13	15	16	.03
24	.00	4.2	.24	.29	.00	.00	.14	.02	14	18	16	.07
25	.00	4.1	.24	.22	.00	.00	.12	.02	7.5	29	16	.06
26	.00	5.1	.24	.24	.00	.00	.07	.02	.02	25	16	.02
27	.00	4.3	.24	.29	.00	.00	.07	.02	.02	23	15	.02
28	.00	2.4	.14	.34	.00	.00	.07	.02	.02	13	14	.02
29	.00	1.4	.14	.38	---	.00	.17	.02	.02	.06	5.4	.02
30	.00	1.4	.14	.44	---	.00	.24	.02	.02	.02	.07	.02
31	.00	---	.14	.44	---	.00	---	.02	---	.02	.07	---
TOTAL	.00	239.80	22.07	6.64	4.79	1.10	66.63	101.49	95.63	176.47	141.50	.93
MEAN	.000	7.99	.71	.21	.17	.035	2.22	3.27	3.19	5.69	4.56	.031
MAX	.00	17	1.3	.44	.45	.24	17	18	18	29	18	.07
MIN	.00	.00	.14	.14	.00	.00	.00	.00	.00	.00	.01	.02
AC-FT	.00	476	44	13	9.5	2.2	132	201	190	350	281	1.8
CAL YR 1976	TOTAL	1276.70	MEAN	3.49	MAX	26	MIN	.00	AC-FT	2530		
WYR YR 1977	TOTAL	857.05	MEAN	2.35	MAX	29	MIN	.00	AC-FT	1700		



## RIO GRANDE BASIN

## 08415000 WARD COUNTY WATER IMPROVEMENT DISTRICT NO. 3 CANAL NEAR BARSTOW, TX

LOCATION.--Lat 31°34'28", Long 103°30'04", Ward County, Hydrologic Unit 13070001, on left bank 96 ft (29 m) upstream from concrete culvert that crosses canal, 2 mi (3 km) downstream from headgate of canal, and 10.5 mi (16.9 km) northwest of Barstow.

PERIOD OF RECORD.--August 1939 to May 1941, August to September 1941, December 1941 to September 1957, and March 1964 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 2,600 ft (792 m), from topographic map. Prior to Dec. 14, 1940, at site 1.75 mi (2.82 km) upstream at datum 2.98 ft (0.908 m) higher. Dec. 14, 1940, to May 26, 1941, at site 1.4 mi (2.3 km) upstream at datum 1.72 ft (0.524 m) higher.

REMARKS.--Records fair. Local runoff is deleted from daily discharge record. Water is diverted from the left bank of Pecos River and is used for irrigation in the vicinity of Barstow. An observation of water temperature was made during the year.

AVERAGE DISCHARGE.--29 years (water years 1940, 1943-57, 1965-77), 9.06 ft<sup>3</sup>/s (0.257 m<sup>3</sup>/s), 6,560 acre-ft/yr (8.09 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 156 ft<sup>3</sup>/s (4.42 m<sup>3</sup>/s) Oct. 24, 1969; no flow at times each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	15	7.1	.00	.00	.00	.00	8.3	.00	.13	29	.09
2	5.0	10	5.6	.00	.00	.00	.00	6.6	.00	.13	28	.08
3	5.0	3.1	.10	.00	.00	.00	.00	5.7	.00	.13	28	.08
4	4.4	3.6	.00	.00	.00	.00	.00	5.2	.00	.16	28	.09
5	4.4	3.6	.00	.00	.00	.00	.00	5.3	.00	.20	28	.07
6	4.1	3.6	.00	.00	.00	.00	.00	5.4	.00	.16	28	.04
7	3.4	3.6	.00	.00	.00	.00	.00	6.6	.00	.16	28	.01
8	3.0	3.6	.00	.00	.00	.00	.00	.10	.00	.16	28	.00
9	2.7	3.7	.00	.00	.00	.00	.00	.03	.00	.16	28	.00
10	2.7	3.7	.00	.00	.00	.00	.00	.00	.00	.13	28	.00
11	3.1	3.6	.00	.00	.00	.00	.00	.00	.00	.10	21	.09
12	3.2	3.4	.00	.00	.00	.00	.00	.01	.00	.07	21	.08
13	3.3	3.4	.00	.00	.00	.00	.00	.04	.00	.04	20	.06
14	3.5	3.4	.00	.00	.00	.00	.00	.05	.00	.04	11	.05
15	3.4	3.4	.00	.00	.00	.00	.02	.01	.00	.02	11	.72
16	3.3	3.4	.00	.00	.00	.00	.02	.00	.00	.00	20	.60
17	3.3	8.3	.00	.00	.00	.00	.00	.00	.00	.00	18	.32
18	3.2	13	.00	.00	.00	.00	.00	.00	.00	.00	18	.13
19	3.1	12	.00	.00	.00	.00	.00	.00	.00	.00	28	.05
20	2.8	10	.00	.00	.00	.00	.00	.00	.00	.00	30	.01
21	2.1	9.5	.00	.00	.00	.00	.00	.00	.00	.00	20	.00
22	1.1	9.1	.00	.00	.00	.00	.00	.00	.00	.00	9.3	.00
23	.59	8.6	.00	.00	.00	.00	.00	.00	.18	.00	.16	.72
24	.12	8.1	.00	.00	.00	.00	.00	.00	.00	.00	.13	21
25	.06	8.4	.00	.00	.00	.00	.00	.00	.00	.00	.13	21
26	.04	7.7	.00	.00	.00	.00	.00	.00	9.7	.00	.13	21
27	.06	6.3	.00	.00	.00	.00	.00	.00	23	29	.13	20
28	.91	6.2	.00	.00	.00	.00	.00	.00	16	29	.10	20
29	9.3	6.2	.00	.00	---	.00	1.0	.00	13	29	.09	20
30	15	6.8	.00	.00	---	.00	8.5	.00	14	29	.08	19
31	16	---	.00	.00	---	.00	---	.00	---	29	.07	---
TOTAL	117.18	194.3	12.80	.00	.00	.00	9.54	43.34	75.88	146.79	509.32	145.29
MEAN	3.78	6.48	.41	.000	.000	.000	.32	1.40	2.53	4.74	16.4	4.84
MAX	16	15	7.1	.00	.00	.00	8.5	8.3	23	29	30	21
MIN	.04	3.1	.00	.00	.00	.00	.00	.00	.00	.00	.07	.00
AC-FT	232	385	25	.00	.00	.00	19	86	151	291	1010	288
CAL YR 1976	TOTAL	4438.03	MEAN	12.1	MAX	60	MIN	.00	AC-FT	8800		
WTR YR 1977	TOTAL	1254.44	MEAN	3.44	MAX	30	MIN	.00	AC-FT	2490		

## RIO GRANDE BASIN

491

## 08418000 WARD COUNTY IRRIGATION DISTRICT NO. 1 CANAL NEAR BARSTOW, TX

LOCATION.--Lat 31°32'26", long 103°29'42", Ward County, Hydrologic Unit 13070001, on left bank 0.6 mi (1.0 km) downstream from headgate of canal and 7.9 mi (12.7 km) northwest of Barstow.

PERIOD OF RECORD.--February 1922 to September 1925 (published as "Barstow Canal near Barstow"), August 1939 to May 1941, October 1941 to September 1957, and March 1964 to current year.

GAGE.--Water-stage recorder. Concrete weir since Nov. 20, 1968. Altitude of gage is 2,600 ft (792 m), from topographic map. Prior to Aug. 15, 1939, at site about 3,000 ft (914 m) upstream at different datum.

REMARKS.--Records good. Local runoff is deleted from daily discharge record. Water is diverted from left bank of Pecos River and is used for irrigation in the vicinity of Barstow. An observation of water temperature was made during the year.

AVERAGE DISCHARGE.--33 years (water years 1923-25, 1940, 1942-57, 1965-77), 30.3 ft<sup>3</sup>/s (0.858 m<sup>3</sup>/s), 21,950 acre-ft/yr (27.1 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 385 ft<sup>3</sup>/s (10.9 m<sup>3</sup>/s) Aug. 30, 1923; no flow at times each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	.20	.07	.00	.00	.00	.00	6.6	16	60	18	13
2	20	.30	.00	.00	.00	.00	.00	6.6	12	11	18	13
3	19	.30	.00	.00	.00	.00	.00	6.2	11	.24	18	12
4	16	15	.00	.00	.00	.00	.00	5.8	14	.36	17	9.8
5	14	28	.00	.00	.00	.00	.00	5.8	18	.25	17	8.5
6	15	27	.00	.00	.00	.00	.00	5.8	16	.24	18	13
7	21	27	.00	.00	.00	.00	.00	8.4	15	.20	17	18
8	21	27	.00	.00	.00	.00	.00	27	14	.16	6.7	18
9	20	27	.00	.00	.00	.00	.00	29	27	.11	.76	17
10	19	27	.00	.00	.00	.00	.00	21	30	.00	.50	15
11	18	27	.00	.00	.00	.00	.00	20	30	.00	.30	7.8
12	18	21	.00	.00	.00	.00	.00	31	30	.00	.17	.23
13	17	.20	.00	.00	.00	.00	.00	36	28	.00	7.9	.06
14	16	.20	.00	.00	.00	.00	.00	34	28	.00	10	.00
15	16	.10	.00	.00	.00	.00	32	24	27	.00	8.5	.00
16	16	.10	.00	.00	.00	.00	49	18	26	.00	8.6	.04
17	15	.10	.00	.00	.00	.00	42	18	26	.00	11	3.3
18	15	.10	.00	.00	.00	.00	41	22	26	.00	10	8.3
19	15	.10	.00	.00	.00	.00	40	24	26	.00	9.9	6.8
20	15	.10	.00	.00	.00	.00	35	24	26	.00	13	6.5
21	14	.10	.00	.00	.00	.00	29	24	25	.00	13	11
22	14	.10	.00	.00	.00	.00	23	23	23	.00	11	14
23	14	.10	.00	.00	.00	.00	18	9.4	2.2	8.9	9.4	14
24	14	.10	.00	.00	.00	.00	14	10	1.6	13	8.2	13
25	13	.10	.00	.00	.00	.00	12	15	1.6	14	18	11
26	13	.09	.00	.00	.00	.00	11	.20	62	38	32	10
27	5.4	.11	.00	.00	.00	.00	12	2.2	31	54	33	9.4
28	.54	.10	.00	.00	.00	.00	11	18	24	55	27	8.9
29	.10	.10	.00	.00	---	.00	9.8	23	19	56	17	7.2
30	.10	.10	.00	.00	---	.00	7.4	21	32	38	13	.15
31	.10	---	.00	.00	---	.00	---	19	---	21	13	---
TOTAL	435.24	228.80	.07	.00	.00	.00	386.20	538.00	667.4	370.46	404.93	268.98
MEAN	14.0	7.63	.002	.000	.000	.000	12.9	17.4	22.2	12.0	13.1	8.97
MAX	21	28	.07	.00	.00	.00	49	36	62	60	33	18
MIN	.10	.09	.00	.00	.00	.00	.00	.20	1.6	.00	.17	.00
AC-FT	863	454	.1	.00	.00	.00	766	1070	1320	735	803	534
CAL YR 1976	TOTAL	6008.73	MEAN	16.4	MAX	113	MIN	.00	AC-FT	11920		
WTR YR 1977	TOTAL	3300.08	MEAN	9.04	MAX	62	MIN	.00	AC-FT	6550		

## RIO GRANDE BASIN

08431700 LIMPIA CREEK ABOVE FORT DAVIS, TX  
(Hydrologic bench-mark station)

LOCATION.--Lat 30°36'55", long 104°00'10", Jeff Davis County, Hydrologic Unit 13070005, on left bank about 600 ft (180 m) upstream from bridge on State Highway 118, about 2,000 ft (610 m) upstream from Jones Creek, and 6.8 mi (10.9 km) west of Fort Davis.

DRAINAGE AREA.--52.4 mi<sup>2</sup> (135.7 km<sup>2</sup>).

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Altitude of gage is about 5,200 ft (1,580 m) above mean sea level.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--12 years, 2.56 ft<sup>3</sup>/s (0.0725 m<sup>3</sup>/s), 0.66 in/yr (17 mm/yr), 1,850 acre-ft/yr (2.28 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,650 ft<sup>3</sup>/s (75.0 m<sup>3</sup>/s) Sept. 21, 1974, gage height, 8.15 ft (2.484 m); no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1925, about 10 ft (3.0 m) in 1939, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4.9 ft<sup>3</sup>/s (0.14 m<sup>3</sup>/s) Oct. 1, gage height, 2.52 ft (0.768 m), no peak above base of 1,000 ft<sup>3</sup>/s (28.3 m<sup>3</sup>/s); no flow most of year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	1.3	.06	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	4.6	1.3	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	4.6	1.1	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	4.3	1.1	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	4.0	1.1	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	3.7	.98	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	3.4	.98	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	3.4	.98	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00
9	3.1	.83	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	2.8	.83	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	2.8	.83	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	2.8	.70	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	2.6	.60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	2.6	.60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	2.8	.60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	2.6	.60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	2.6	.60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	2.1	.60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	2.1	.60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	1.9	.60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	1.9	.51	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	1.9	.51	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	1.9	.51	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	1.9	.43	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	1.9	.43	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	1.7	.35	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	1.7	.35	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	1.7	.15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	1.7	.09	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
30	1.5	.07	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
31	1.5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
TOTAL	82.7	20.23	.16	.00	.00	.00	.00	.00	.00	.01	.00	.00
MEAN	2.67	.67	.005	.000	.000	.000	.000	.000	.000	.000	.000	.000
MAX	4.6	1.3	.06	.00	.00	.00	.00	.00	.00	.01	.00	.00
MIN	1.5	.07	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
CFSM	.05	.01	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
IN.	.06	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	164	40	.3	.00	.00	.00	.00	.00	.00	.02	.00	.00
(+)	.69	.32	.66	.28	.00	.20	1.02	1.10	1.20	3.89	1.28	.00
CAL YR 1976	TOTAL	1019.44	MEAN	2.79	MAX	104	MIN	.00	CFSM	.05	IN	.72
WTR YR 1977	TOTAL	103.10	MEAN	.28	MAX	4.6	MIN	.00	CFSM	.005	IN	.07
									AC-FT	2020	++	15.21
											++	10.64

++ Rainfall, in inches.

RIO GRANDE BASIN

493

08431700 LIMPIA CREEK ABOVE FORT DAVIS, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: May 1965 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)
OCT 06...	0945	3.6	208	8.0	15.0	66	1	21	3.4	7.8
NOV 18...	0825	.65	164	7.8	10.5	59	0	20	2.3	7.0
DATE	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	
OCT 06...	.4	2.9	80	0	11	4.4	.4	33	123	
NOV 18...	.4	2.5	76	0	11	4.2	.4	29	114	

## RIO GRANDE BASIN

08431800 LIMPIA CREEK BELOW FORT DAVIS, TX

LOCATION.--Lat 30°40'52", Long 103°47'30", Jeff Davis County, Hydrologic Unit 13070005, on downstream side of bridge on State Highway 17, 0.9 mi (1.4 km) upstream from Frazier Canyon, and 9.0 mi (14.5 km) northeast of Fort Davis.

DRAINAGE AREA.--227 mi<sup>2</sup> (588 km<sup>2</sup>).

PERIOD OF RECORD.--November 1961 to September 1977 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 4,459.22 ft (1,359.170 m) above mean sea level.

REMARKS.--Records good. No diversion above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--15 years (water years 1963-77), 5.42 ft<sup>3</sup>/s (0.153 m<sup>3</sup>/s), 0.32 in/yr (8 mm/yr), 3,930 acre-ft/yr (4.85 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,520 ft<sup>3</sup>/s (156 m<sup>3</sup>/s) Sept. 21, 1974, gage height, 7.70 ft (2.347 m); maximum gage height, 7.85 ft (2.393 m) June 10, 1964; no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stages since 1904 occurred in 1932 and 1946 (stages unknown), the 1932 flood was the greatest, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 246 ft<sup>3</sup>/s (6.97 m<sup>3</sup>/s) May 11, gage height, 3.83 ft (1.167 m), no peak above base of 1,300 ft<sup>3</sup>/s (36.8 m<sup>3</sup>/s); no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	3.5	3.2	2.9	2.6	2.0	1.4	.53	.10	.05	.12	.01
2	9.0	3.4	3.2	2.9	2.6	1.9	1.3	.53	.08	.04	.09	.01
3	8.0	3.3	3.3	2.9	2.5	1.9	1.2	.53	.07	.04	.07	.00
4	7.1	3.4	3.3	2.8	2.5	1.9	1.1	.48	.07	.04	.06	.00
5	6.5	3.4	3.4	2.9	2.5	1.8	1.1	.41	.06	.04	.05	.00
6	6.7	3.3	3.3	2.9	2.5	1.8	1.1	.36	.05	.03	.06	.00
7	5.8	3.1	3.2	2.9	2.5	1.7	1.0	.37	.05	.04	.05	.00
8	5.8	3.2	3.1	3.0	2.5	1.8	1.0	.37	.07	.05	.05	.00
9	5.8	3.4	3.2	3.1	2.5	1.8	.99	.36	.06	.05	.06	.00
10	5.6	3.3	3.2	2.9	2.5	1.8	.93	.38	.06	.04	.07	.00
11	5.4	3.2	3.2	2.9	2.6	1.7	.91	14	.05	.05	.08	.00
12	5.2	3.5	3.2	3.1	2.4	1.6	.87	28	.09	.04	.10	.00
13	5.0	3.7	3.9	3.1	2.4	1.6	.89	4.9	.08	.05	.10	.00
14	5.9	3.8	4.0	2.9	2.3	1.6	.80	1.7	.06	.05	.11	.00
15	5.6	3.9	3.6	2.7	2.3	1.5	.80	.59	.05	.04	.10	.00
16	4.2	3.7	3.2	2.7	2.3	1.5	1.1	.31	.04	.04	.08	.00
17	4.0	4.1	3.2	2.7	2.3	1.6	1.4	.14	.03	.03	.07	.00
18	4.0	4.0	3.2	2.6	2.3	1.5	1.1	.08	.03	.03	.06	.00
19	3.8	3.7	3.2	2.7	2.3	1.4	.86	.07	.02	.03	.05	.00
20	3.8	3.5	3.0	2.6	2.2	1.4	.82	.05	.02	.03	.04	.00
21	3.8	3.4	3.1	2.6	2.2	1.4	.74	.04	.04	.03	.05	.00
22	3.7	3.4	3.1	2.8	2.2	1.4	.74	.04	.09	.03	.05	.00
23	3.7	3.4	3.0	2.7	1.9	1.4	.67	.04	.14	.03	.06	.00
24	3.7	3.4	3.1	2.6	1.8	1.5	.66	.03	.10	.03	.06	.00
25	3.6	3.5	3.0	2.6	1.9	1.5	.59	.03	.08	.04	.06	.00
26	3.6	3.4	2.9	2.6	1.9	1.7	.56	.02	.08	.04	.05	.00
27	3.5	3.2	3.0	2.6	1.9	2.2	.53	.02	.07	.04	.04	.00
28	3.9	3.2	2.9	2.6	1.9	1.9	.55	.02	.06	.03	.04	.00
29	4.3	3.2	2.9	2.6	---	1.6	.54	.02	.11	.09	.03	.00
30	3.8	3.2	3.0	2.6	---	1.4	.57	.06	.07	.19	.02	.00
31	3.5	---	2.9	2.6	---	1.3	---	.10	---	.16	.02	---
TOTAL	157.3	103.7	99.0	86.1	64.3	51.1	26.82	54.58	1.98	1.52	1.95	.02
MEAN	5.07	3.46	3.19	2.78	2.30	1.65	.89	1.76	.066	.049	.063	.001
MAX	9.0	4.1	4.0	3.1	2.6	2.2	1.4	.28	.14	.19	.12	.01
MIN	3.5	3.1	2.9	2.6	1.8	1.3	.53	.02	.02	.03	.02	.00
CFSM	.02	.01	.01	.01	.01	.007	.004	.008	.000	.000	.000	.000
IN.	.03	.02	.02	.01	.01	.01	.00	.01	.00	.00	.00	.00
AC-FT	312	206	196	171	128	101	53	108	3.9	3.0	3.9	.04
CAL YR 1976	TOTAL	2669.85	MEAN	7.29	MAX	248	MIN	.00	CFSM	.03	IN	.44
WTR YR 1977	TOTAL	648.37	MEAN	1.78	MAX	28	MIN	.00	CFSM	.008	IN	.11
									AC-FT	5300		
									AC-FT	1290		

RIO GRANDE BASIN

495

08433000 BARRILLA DRAW NEAR SARAGOSA, TX

LOCATION.--Lat 30°57'28", long 103°27'33", Reeves County, Hydrologic Unit 13070005, on right bank at downstream side of bridge on U.S. Highway 290 (Interstate 10), 12.2 mi (19.6 km) east of Saragosa, 17.0 mi (27.4 km) east of Balmorhea, and 34.4 mi (55.3 km) west of Fort Stockton.

DRAINAGE AREA.--612 mi<sup>2</sup> (1,585 km<sup>2</sup>).

REVISED RECORDS.--WSP 1312: 1925.

PERIOD OF RECORD.--December 1924 to July 1926, June to September 1932 (published as "Barrilla Creek"), October 1975 to current year.

REMARKS.--Records excellent. Considerable diversion for irrigation by spreader dams above station.

GAGE.--Water-stage recorder. Datum of gage is 3,083.36 ft (939.808 m) above mean sea level. Prior to Oct. 1, 1975, water-stage recorder at site 600 ft (180 m) upstream at different datum.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,500 ft<sup>3</sup>/s (439 m<sup>3</sup>/s) Aug. 30, 1932, gage height, 10.45 ft (3.185 m), site and datum then in use; no flow most of time.

EXTREMES FOR CURRENT YEAR.--No flow during year.



## RIO GRANDE BASIN

08435700 SUNNY GLEN CANYON NEAR ALPINE, TX

LOCATION.--Lat 30°22'52", long 103°44'08", Brewster County, Hydrologic Unit 13070006, on right bank just upstream from private low-water crossing, about 200 ft (61 m) north of the end of Farm Road 1703, 4.7 mi (7.6 km) northwest of Alpine, and 9.2 mi (14.8 km) upstream from Paisano Creek.

DRAINAGE AREA.--29.7 mi<sup>2</sup> (76.9 km<sup>2</sup>).

PERIOD OF RECORD.--February 1968 to September 1977 (discontinued).

GAGE.--Water-stage recorder. Altitude of gage is about 4,660 ft (1,420 m).

REMARKS.--Records good. No known diversions or regulation above station.

AVERAGE DISCHARGE.--9 years, 0.290 ft<sup>3</sup>/s (0.0082 m<sup>3</sup>/s), 0.13 in/yr (3 mm/yr), 210 acre-ft/yr (259,000 m<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 576 ft<sup>3</sup>/s (16.3 m<sup>3</sup>/s) Sept. 21, 1974, gage height, 2.71 ft (0.826 m); no flow most of time each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.95	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.06	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	.00	.00	.00	.00	.00	.00	.00	.06	.00	.95	.00	.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.002	.000	.031	.000	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.06	.00	.95	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
CFSM	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000	.000
IN.	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.1	.00	1.9	.00	.00
CAL YR 1976	TOTAL	0.00	MEAN	.000	MAX	.00	MIN	.00	CFSM	.000	IN	.00
WTR YR 1977	TOTAL	1.01	MEAN	.003	MAX	.95	MIN	.00	CFSM	.000	IN	.00
									AC-FT	.00		
									AC-FT	2.0		

08435800 COYANOSA DRAW NEAR FORT STOCKTON, TX

LOCATION.--Lat 31°02'27", long 103°08'15", Pecos County, Hydrologic Unit 13070006, at downstream side of bridge on U.S. Highway 285 and 18.4 mi (29.6 km) northwest of Fort Stockton.

DRAINAGE AREA.--1,182 mi<sup>2</sup> (3,061 km<sup>2</sup>).

PERIOD OF RECORD.--February 1964 to September 1977 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 2,846.86 ft (867.72 m) above mean sea level (Texas Highway Department bridge plans). Jan. 22 to Sept. 30, 1969, nonrecording gage at same site and datum.

REMARKS.--Records poor. No known regulation or diversion.

AVERAGE DISCHARGE.--13 years (water years 1965-77), 3.74 ft<sup>3</sup>/s (0.106 m<sup>3</sup>/s), 0.04 in/yr (1 mm/yr), 2,710 acre-ft/yr (3.34 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,600 ft<sup>3</sup>/s (357 m<sup>3</sup>/s) June 15, 1967, gage height, 15.20 ft (4.633 m); no flow most of time each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage occurred in 1954, 19.6 ft (5.97 m). Discharge for flood of Sept. 4, 1925, 4,070 ft<sup>3</sup>/s (115 m<sup>3</sup>/s), by slope-area measurement, at site 8 mi (13 km) upstream on U.S. Highway 290.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft<sup>3</sup>/s (2.83 m<sup>3</sup>/s) and maximum (\*);

Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)	Date	Time	Discharge (ft <sup>3</sup> /s) (m <sup>3</sup> /s)	Gage height (ft) (m)				
May 11	0100	115	3.26	5.34	1.628	June 30	2200	159	4.50	5.56	1.695
June 21	1430	207	5.86	5.80	1.768	Aug. 20	1930	568	16.1	7.05	2.149
June 23	0200	*750	21.2	7.50	2.286	Aug. 24	0500	254	7.19	6.01	1.832

Minimum discharge, no flow most of year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
11	.00	.00	.00	.00	.00	.00	.00	5.3	.00	.00	.00	.00		
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	42	.00		
21	.00	.00	.00	.00	.00	.00	.00	.00	22	.00	.00	.00		
22	.00	.00	.00	.00	.00	.00	.00	.00	.27	.00	.00	.00		
23	.00	.00	.00	.00	.00	.00	.00	.00	81	.00	.00	.00		
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	119	.00		
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00		
30	.00	.00	.00	.00	---	.00	.00	.00	6.9	.00	.00	.00		
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---		
TOTAL	.00	.00	.00	.00	.00	.00	.00	5.30	110.17	.00	161.00	.00		
MEAN	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.17	3.67	.0000	5.19	.0000		
MAX	.00	.00	.00	.00	.00	.00	.00	5.3	81	.00	119	.00		
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
CFSM	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.003	.0000	.004	.0000		
IN.	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00		
AC-FT	.00	.00	.00	.00	.00	.00	.00	11	219	.00	319	.00		
CAL YR 1976	TOTAL	245.60	MEAN	.67	MAX	75	MIN	.00	CFSM	.001	IN	.01	AC-FT	487
WTR YR 1977	TOTAL	276.47	MEAN	.76	MAX	119	MIN	.00	CFSM	.001	IN	.01	AC-FT	548

## 08436500 PECOS COUNTY WATER IMPROVEMENT DISTRICT NO. 2 (UPPER DIVERSION) CANAL NEAR GRANDFALLS, TX

LOCATION.--Lat 31°18'43", long 102°55'10", Ward County, Hydrologic Unit 13070001, on left bank about 2.5 mi (4.0 km) upstream from bridge on State Highway 18, 4.6 mi (7.4 km) southwest of Grandfalls, and 12.5 mi (20.1 km) downstream from headgate of canal.

PERIOD OF RECORD.--March 1922 to July 1925 (published as "Imperial Highline Canal near Grandfalls"), August 1939 to September 1957, and March 1964 to current year.

GAGE.--Water-stage recorder. Concrete weir since Dec. 8, 1947. Altitude of gage is 2,455 ft (748 m), from topographic map. Prior to Aug. 21, 1939, water-stage recorder at site 8.5 mi (13.7 km) upstream at different datum. Aug. 21 to Oct. 3, 1939, and May 25 to Aug. 4, 1941, staff gage, and Oct. 4, 1939, to May 21, 1941, and Aug. 5, 1941, to Sept. 30, 1957, water-stage recorder at site 2.5 mi (4.0 km) downstream at different datum.

REMARKS.--Records good. Local runoff is deleted from daily discharge record. Water is diverted from right bank of Pecos River and is used for irrigation and to supply water for Imperial Reservoir. Water is released from Imperial Reservoir into Pecos County Water Improvement District No. 2 canal and into Pecos County Water Improvement District No. 3 canal for irrigation.

AVERAGE DISCHARGE.--32 years (water years 1924, 1940-57, 1965-77), 32.5 ft<sup>3</sup>/s (0.920 m<sup>3</sup>/s), 23,550 acre-ft/yr (29.0 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 368 ft<sup>3</sup>/s (10.4 m<sup>3</sup>/s) Sept. 18, 1923; no flow at times each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	1.2	.00	93	4.5
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	111	4.7
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	117	36
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	117	146
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	119	147
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.0	118	149
7	.00	.00	.00	.00	.00	41	.00	.00	.00	101	118	139
8	.00	.00	.00	.00	.00	148	.00	.00	.00	106	118	60
9	.00	.00	.00	.00	.00	152	.00	.00	.00	103	119	28
10	.00	.00	.00	.00	.00	157	.00	.00	.00	110	125	1.8
11	.00	.00	.00	.00	.00	189	.00	.00	.00	115	132	.01
12	.00	.00	.00	.00	.00	190	.00	.00	.00	83	135	.00
13	.00	.00	.00	.00	.00	191	.00	.00	.00	37	96	.00
14	.00	.00	.00	.00	.00	192	.00	.00	.00	6.4	42	.00
15	.00	.00	.00	.00	.00	193	.00	.00	.00	.03	23	.00
16	.00	.00	.00	.00	.00	194	.00	28	.00	.00	1.7	.00
17	.00	.00	.00	.00	.00	186	.00	92	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	129	.00	105	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	77	.00	108	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	8.3	.00	111	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.69	.00	110	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.17	.00	111	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	118	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	161	.00	.00	18	.00
25	.00	.00	.00	.00	.00	.00	.00	166	.00	.00	73	.00
26	.00	.00	.00	.00	.00	.00	.00	172	.00	.00	55	.00
27	.00	.00	.00	.00	.00	.00	.00	171	.00	.00	51	.00
28	.00	.00	.00	.00	.00	.00	.00	176	.00	.00	5.9	.00
29	.00	.00	.00	.00	.00	.00	.00	135	.00	7.8	4.6	.00
30	.00	.00	.00	.00	.00	.00	.00	49	.00	69	4.5	.00
31	.00	.00	.00	.00	.00	.00	.00	23	.00	78	4.5	.00
TOTAL	.00	.00	.00	.00	.00	2048.16	.00	1836.00	1.20	818.23	1801.20	716.01
MEAN	.000	.000	.000	.000	.000	66.1	.000	59.2	.040	26.4	58.1	23.9
MAX	.00	.00	.00	.00	.00	194	.00	176	1.2	115	135	149
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	4060	.00	3640	2.4	1620	3570	1420
CAL YR 1976	TOTAL	10840.94	MEAN	29.6	MAX	249	MIN	.00	AC-FT	21500		
WTR YR 1977	TOTAL	7220.80	MEAN	19.8	MAX	194	MIN	.00	AC-FT	14320		

RIO GRANDE BASIN

499

08437500 PECOS COUNTY WATER IMPROVEMENT DISTRICT NO. 2 CANAL NEAR IMPERIAL, TX

LOCATION.--Lat 31°16'38", long 102°43'54", Pecos County, Hydrologic Unit 13070001, on left bank about 2.4 mi (3.9 km) west of Imperial and about 7.5 mi (12.1 km) downstream from Imperial Reservoir.

PERIOD OF RECORD.--April 1940 to May 1941, March 1942 to September 1957, and March 1964 to current year.

GAGE.--Water-stage recorder. Wooden weir June 1, 1943, to Feb. 29, 1964, and concrete weir since Mar. 1, 1964. Altitude of gage is about 2,400 ft (732 m), from topographic map. Prior to July 11, 1940, at site 1.5 mi (2.4 km) upstream at different datum. July 12, 1940, to Mar. 23, 1942, at site 2.5 mi (4.0 km) upstream at datum 3.36 ft (1.024 m) higher. Mar. 24, 1942, to May 31, 1943, at site 0.5 mi (0.8 km) upstream at datum 0.70 ft (0.213 m) higher.

REMARKS.--Records good. Local runoff is deleted from daily discharge record. Water is diverted from Imperial Reservoir (on right bank of Pecos River) for irrigation in the vicinity of Imperial. The total flow at this station does not include 520 acre-ft (641,000 m³) that is diverted from canal 75 ft (23 m) upstream.

AVERAGE DISCHARGE.--28 years (water years 1943-57, 1965-77), 13.0 ft³/s (0.368 m³/s), 9,420 acre-ft/yr (11.6 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 144 ft³/s (4.08 m³/s) July 27, 28, 31, Aug. 1, 1945; no flow at times each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	33	4.5	20	28	24	.00	.00
2	.00	.00	.00	.00	.00	43	.00	.90	22	16	13	.00
3	.00	.00	.00	.00	.00	41	.00	1.6	12	.34	33	.00
4	47	.00	.00	.00	.00	40	.00	5.6	1.4	.00	23	.00
5	58	.00	.00	.00	.00	41	.00	1.9	.65	.00	4.1	.00
6	57	.00	.00	.00	.00	42	.00	1.0	.13	.00	.00	.00
7	57	.00	.00	.00	.00	32	.00	.05	.00	.00	.00	.00
8	58	.00	.00	.00	.00	25	.00	.00	.00	.00	.00	.00
9	57	.00	.00	.00	.00	26	.00	.00	.00	.00	.00	.00
10	41	.00	.00	.00	.00	26	.00	.00	.00	.00	.00	.00
11	25	.00	.00	.00	.00	24	.00	.00	.00	.00	.00	.00
12	24	.00	.00	.00	.00	21	.00	.00	.12	6.5	.00	.00
13	24	.00	.00	.00	.00	23	.00	15	.33	25	.00	.00
14	24	.00	.00	.00	.00	24	.00	18	.00	33	.00	13
15	24	.00	.00	.00	.00	28	.00	17	.00	54	23	23
16	23	.00	.00	.00	.00	33	.00	17	.00	54	28	23
17	23	.00	.00	.00	.00	34	.00	15	.00	53	24	31
18	16	.00	.00	.00	.00	32	.00	1.2	16	44	24	41
19	.13	.00	.00	.00	.00	38	.00	.00	33	26	26	41
20	.00	.00	.00	.00	.00	31	.00	.00	20	21	22	41
21	.00	.00	.00	.00	37	34	.00	.00	28	26	22	40
22	.00	.00	.00	.00	37	34	.00	.00	35	36	21	39
23	.00	.00	.00	.00	.93	25	.00	.00	34	35	38	39
24	.00	.00	.00	.00	.00	20	.00	.00	34	32	39	38
25	.00	.00	.00	.00	.00	18	56	.00	35	32	41	38
26	.00	.00	.00	.00	.00	32	62	1.6	37	32	49	36
27	.00	.00	.00	.00	.00	38	49	34	36	18	40	32
28	.00	.00	.00	.00	.00	37	47	34	34	1.1	19	20
29	.00	.00	.00	.00	---	33	34	24	25	8.6	2.7	13
30	.00	.00	.00	.00	---	32	32	23	24	1.3	.00	.00
31	.00	---	.00	.00	---	31	---	28	---	.23	.00	---
TOTAL	558.13	.00	.00	.00	74.93	971	284.50	258.85	455.63	579.07	491.80	508.00
MEAN	18.0	.000	.000	.000	2.68	31.3	9.48	8.35	15.2	18.7	15.9	16.9
MAX	58	.00	.00	.00	37	43	62	34	37	54	49	41
MIN	.00	.00	.00	.00	.00	18	.00	.00	.00	.00	.00	.00
AC-FT	1110	.00	.00	.00	149	1930	564	513	904	1150	975	1010
CAL YR 1976	TOTAL	4868.42	MEAN 13.3	MAX 69	MIN .00	AC-FT 9660						
WTR YR 1977	TOTAL	4181.91	MEAN 11.5	MAX 62	MIN .00	AC-FT 8290						

## RIO GRANDE BASIN

## 08437600 PECOS COUNTY WATER IMPROVEMENT DISTRICT NO. 3 CANAL NEAR IMPERIAL, TX

LOCATION.--Lat 31°16'51", long 102°44'26", Pecos County, Hydrologic Unit 13070001, on left bank about 220 ft (67 m) upstream from crossing of Farm Road 11, 0.3 mi (0.5 km) downstream from headgate (Pecos No. 2 canal), and 2.9 mi (4.7 km) west of Imperial.

PERIOD OF RECORD.--March 1940 to September 1941, March 1942 to September 1957, and March 1964 to current year.

GAGE.--Water-stage recorder. Concrete weir since Mar. 7, 1944. Altitude of gage is 2,390 ft (728 m), from topographic map. Prior to Jan. 10, 1941, at site 350 ft (107 m) downstream at datum 6.79 ft (2.070 m) lower. Jan. 10, 1941, to Mar. 29, 1942, at site 200 ft (61 m) downstream at datum 3.65 ft (1.113 m) lower.

REMARKS.--Records good. Local runoff is deleted from daily discharge record. Water is diverted from Imperial Reservoir (on right bank of Pecos River) for irrigation in the vicinity of Imperial.

AVERAGE DISCHARGE.--29 years (water years 1941, 1943-57, 1965-77), 10.2 ft<sup>3</sup>/s (0.289 m<sup>3</sup>/s), 7,390 acre-ft/yr (9.11 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 175 ft<sup>3</sup>/s (4.96 m<sup>3</sup>/s) Aug. 11, 1940; no flow at times each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	24	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	23	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00
4	.00	.00	.00	.00	.00	3.4	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	21	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	18	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.29	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.12	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	39	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	47	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	18	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	1.8	.00	.00	5.3	.00	3.7	.00
19	.00	.00	.00	.00	.00	18	.00	.00	21	.00	20	.00
20	.00	.00	.00	.00	.00	18	.00	.00	19	.00	30	.00
21	.00	.00	.00	.00	26	18	.00	.00	19	1.2	42	.00
22	.58	.00	.00	.00	27	19	.00	.00	19	20	19	.00
23	.00	.00	.00	.00	6.7	32	.00	.00	19	21	.01	.00
24	.00	.00	.00	.00	.08	29	.00	.00	19	21	.00	.00
25	.00	.00	.00	.00	.00	20	.00	.00	22	.46	.00	.00
26	.00	.00	.00	.00	.00	21	1.2	.00	26	.00	.00	.00
27	.00	.00	.00	.00	.00	21	16	.00	26	.00	.00	4.7
28	.49	.00	.00	.00	.00	12	18	.00	20	2.1	.00	21
29	.71	.00	.00	.00	---	.00	.03	.00	.00	21	.00	19
30	.32	.00	.00	.00	---	.00	.00	.00	.00	22	.00	.81
31	.02	---	.00	.00	---	.00	---	.00	---	24	.00	---
TOTAL	2.12	.00	.00	.00	59.78	252.61	35.23	.00	215.30	236.76	161.72	45.51
MEAN	.068	.000	.000	.000	2.14	8.15	1.17	.000	7.18	7.64	5.22	1.52
MAX	.71	.00	.00	.00	27	32	18	.00	26	47	42	21
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	4.2	.00	.00	.00	119	501	70	.00	427	470	321	90
CAL YR 1976	TOTAL	1017.64	MEAN 2.78	MAX 44	MIN .00	AC-FT 2020						
WTR YR 1977	TOTAL	1009.03	MEAN 2.76	MAX 47	MIN .00	AC-FT 2000						

## RIO GRANDE BASIN

501

## 08437700 WARD COUNTY WATER IMPROVEMENT DISTRICT NO. 2 CANAL NEAR GRANDFALLS, TX

LOCATION.--Lat 31°22'13", long 103°00'24", Ward County, Hydrologic Unit 13070001, on left bank 1,550 ft (477 m) upstream from Farm Road 1776, 2.3 mi (3.7 km) downstream from headgate, and 9.5 mi (15.3 km) west of Grandfalls.

PERIOD OF RECORD.--August 1939 to September 1941, November 1941 to September 1957, and March 1964 to current year.

GAGE.--Water-stage recorder. Concrete weir since Feb. 17, 1947. Altitude of gage is 2,460 ft (750 m), from topographic map. Prior to Jan. 10, 1941, at site 1.75 mi (2.82 km) downstream at different datum. Jan. 11, 1941, to Feb. 16, 1947, at site 50 ft (15 m) downstream at present datum.

REMARKS.--Records good. Local runoff is deleted from the discharge record. Water is diverted from the left bank of the Pecos River for irrigation in the vicinity of Grandfalls. Several observations of water temperature were obtained during the year.

AVERAGE DISCHARGE.--29 years (water years 1940, 1943-57, 1965-77), 20.6 ft<sup>3</sup>/s (0.583 m<sup>3</sup>/s), 14,920 acre-ft/yr (18.4 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 198 ft<sup>3</sup>/s (5.61 m<sup>3</sup>/s) Apr. 9, 10, 1947; no flow at times each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	.00	.00	.00	.00	.00	.00	.00	24	1.8	1.9	106
2	20	.00	.00	.00	.00	.00	.00	.00	20	3.0	1.9	107
3	18	.00	.00	.00	.00	.00	.00	.00	17	16	2.1	103
4	14	.00	.00	.00	.00	.00	.00	.00	14	63	2.1	21
5	15	.00	.00	.00	.00	.00	.00	.00	12	71	1.9	4.0
6	14	.00	.00	.00	.00	.00	.00	.00	9.7	71	1.9	3.7
7	13	.00	.00	.00	.00	.00	.00	.00	8.7	25	1.9	3.5
8	13	.00	.00	.00	.00	.00	.00	3.7	8.4	4.2	1.9	2.9
9	13	.00	.00	.00	.00	.00	.00	8.4	7.3	2.5	1.9	3.1
10	14	.00	.00	.00	.00	.00	.00	3.0	6.3	.16	1.9	29
11	12	.00	.00	.00	.00	.00	.00	3.4	5.5	.00	1.9	24
12	12	.00	.00	.00	.00	.00	.00	3.8	5.1	.00	1.9	22
13	12	.00	.00	.00	.00	.00	.00	4.0	4.6	.00	1.9	15
14	12	.00	.00	.00	.00	.00	.00	27	4.2	.93	1.8	3.1
15	12	.00	.00	.00	.00	.00	.00	78	3.8	2.0	1.5	4.0
16	12	.00	.00	.00	.00	.00	.00	77	3.3	1.9	15	4.0
17	8.5	.00	.00	.00	.00	.00	.00	51	3.2	1.7	15	3.2
18	.03	.00	.00	.00	.00	.00	.00	49	3.0	1.6	11	3.3
19	.00	.00	.00	.00	.00	.00	.00	55	2.4	1.5	9.2	3.6
20	.00	.00	.00	.00	.00	.00	.00	57	2.3	1.4	7.7	3.2
21	.00	.00	.00	.00	.00	.00	.00	57	2.7	1.2	6.8	3.7
22	.00	.00	.00	.00	.00	.00	.00	58	53	1.1	23	3.2
23	.00	.00	.00	.00	.00	.00	.00	56	46	.98	46	3.1
24	.00	.00	.00	.00	.00	.00	.00	14	1.1	.88	72	2.5
25	.00	.00	.00	.00	.00	.00	.00	2.9	.82	.76	68	2.1
26	.00	.00	.00	.00	.00	.00	.00	7.7	.72	.65	60	2.0
27	.00	.00	.00	.00	.00	.00	.00	6.4	.92	.61	63	1.9
28	.00	.00	.00	.00	.00	.00	.00	7.7	2.9	21	94	1.7
29	.00	.00	.00	.00	---	.00	.00	5.2	1.7	37	101	1.5
30	.00	.00	.00	.00	---	.00	.00	1.3	1.4	16	103	1.3
31	.00	---	.00	.00	---	.00	---	3.3	---	2.7	103	---
TOTAL	235.53	.00	.00	.00	.00	.00	.00	639.80	276.06	351.57	826.1	491.6
MEAN	7.60	.000	.000	.000	.000	.000	.000	20.6	9.20	11.3	26.6	16.4
MAX	21	.00	.00	.00	.00	.00	.00	78	53	71	103	107
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.72	.00	1.5	1.3
AC-FT	467	.00	.00	.00	.00	.00	.00	1270	548	697	1640	975
CAL YR 1976	TOTAL	3662.29	MEAN	10.0	MAX	128	MIN	.00	AC-FT	7260		
WTR YR 1977	TOTAL	2820.66	MEAN	7.73	MAX	107	MIN	.00	AC-FT	5590		



## RIO GRANDE BASIN

08446500 PECOS RIVER NEAR GIRVIN, TX

LOCATION.--Lat 31°06'47", long 102°25'02", Pecos County, Hydrologic Unit 13070008, on right bank 2.1 mi (3.4 km) upstream from Comanche Creek, 3.8 mi (6.1 km) northwest of Girvin, and 7.2 mi (11.6 km) upstream from bridge on U.S. Highway 67.

DRAINAGE AREA.--29,560 mi<sup>2</sup> (76,560 km<sup>2</sup>), approximately for contributing area of supplementary gage 7.2 mi (11.6 km) downstream.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1939 to current year.

GAGE.--Water-stage recorder and combination concrete control and measuring flume. Supplementary water-stage recorder, used as regular gage prior to July 17, 1951, and now used only for flows with peaks exceeding about 400 ft<sup>3</sup>/s (11.3 m<sup>3</sup>/s), 7.2 mi (11.6 km) downstream at datum 2,269.65 ft (691.789 m) above mean sea level.

REMARKS.--Water-discharge records good. Flow is largely regulated by Red Bluff Reservoir (station 08410000) and reservoirs above Carlsbad, N. Mex. Numerous diversions above station for irrigation.

AVERAGE DISCHARGE.--38 years, 92.5 ft<sup>3</sup>/s (2.620 m<sup>3</sup>/s), 67,020 acre-ft/yr (82.6 hm<sup>3</sup>/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft<sup>3</sup>/s (566 m<sup>3</sup>/s) Oct. 5, 1941, gage height, 20.49 ft (6.245 m), at supplementary gage; minimum daily, 2.2 ft<sup>3</sup>/s (0.062 m<sup>3</sup>/s) July 18, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1932, that of Oct. 5, 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 95 ft<sup>3</sup>/s (2.69 m<sup>3</sup>/s) Mar. 11, gage height, 1.79 ft (0.546 m); maximum gage height, 1.87 ft (0.570 m) June 28; minimum daily discharge, 7.1 ft<sup>3</sup>/s (0.20 m<sup>3</sup>/s) Aug. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	27	33	38	34	29	42	18	12	11	9.8	12
2	27	27	32	37	34	29	40	16	11	10	9.2	9.4
3	26	27	32	37	34	29	38	16	11	9.8	20	8.3
4	26	27	33	37	34	29	37	15	10	9.0	23	13
5	24	27	33	37	34	27	36	15	10	17	18	24
6	21	29	33	36	33	28	33	15	10	16	16	26
7	20	30	33	36	33	28	31	13	10	14	12	34
8	19	30	33	36	33	28	26	13	11	12	10	33
9	18	30	34	36	33	27	21	14	9.7	11	9.9	27
10	19	30	34	36	33	49	21	14	9.7	11	9.7	19
11	18	34	34	36	35	90	22	15	9.9	9.9	9.4	16
12	17	39	36	37	35	64	23	17	10	13	9.6	15
13	16	39	36	37	34	46	23	15	10	22	9.2	13
14	16	36	37	37	33	44	41	14	17	16	9.7	12
15	19	35	37	37	33	42	43	14	14	13	9.7	11
16	25	34	37	36	33	35	27	13	12	11	9.0	10
17	17	34	37	36	33	30	27	13	11	11	9.1	9.9
18	16	34	36	35	33	28	27	13	10	10	9.5	19
19	15	35	36	34	32	26	27	13	10	9.9	9.7	26
20	16	40	36	35	31	24	31	13	10	9.5	8.6	14
21	16	50	36	36	31	24	48	13	9.7	10	8.6	10
22	16	52	34	36	32	23	79	10	11	9.3	8.9	9.4
23	15	52	32	36	32	23	59	10	10	13	8.9	9.5
24	16	48	37	36	31	24	39	9.5	9.1	14	8.7	13
25	16	43	36	35	31	55	30	9.6	9.5	13	8.6	13
26	16	39	34	35	30	64	26	9.7	10	11	7.1	23
27	18	37	35	35	30	59	22	18	9.7	11	7.3	35
28	27	35	35	35	29	53	21	40	44	11	7.9	21
29	30	33	31	34	---	49	20	14	22	11	32	18
30	30	33	34	33	---	46	19	13	16	10	21	16
31	28	---	43	33	---	43	---	13	---	10	14	---
TOTAL	632	1066	1079	1110	913	1195	979	448.8	369.3	369.4	364.1	519.5
MEAN	20.4	35.5	34.8	35.8	32.6	38.5	32.6	14.5	12.3	11.9	11.7	17.3
MAX	30	52	43	38	35	90	79	40	44	22	32	35
MIN	15	27	31	33	29	23	19	9.5	9.1	9.0	7.1	8.3
AC-FT	1250	2110	2140	2200	1810	2370	1940	890	733	733	722	1030
CAL YR 1976	TOTAL	10297.0	MEAN 28.1	MAX 158	MIN 11	AC-FT 20420						
WTR YR 1977	TOTAL	9045.1	MEAN 24.8	MAX 90	MIN 7.1	AC-FT 17940						

08446500 PECOS RIVER NEAR GIRVIN, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1939 to June 1941, October 1946 to September 1947, October 1953 to current year.  
Pesticide analyses: October 1968 to September 1974.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1939 to June 1941, October 1946 to September 1947, October 1953 to current year.  
WATER TEMPERATURES: October 1953 to January 1959, March 1964 to current year.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 38,900 micromhos Aug. 6, 1965; minimum daily, 790 micromhos Apr. 26, 1957.  
WATER TEMPERATURES (1953-59, 1964-68, 1970-77): Maximum daily, 34.0°C on several days during summer months; minimum daily, 3.0°C Feb. 3, 4, 1956.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 28,800 micromhos Aug. 4; minimum daily, 12,500 micromhos Apr. 16.  
WATER TEMPERATURES: Maximum daily, 34.0°C on several days during summer months; minimum daily, 5.0°C Dec. 3, Jan. 10, 19.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)
OCT 08...	1245	18	16500	7.6	13.5	3200	3100	620	390	2700
DEC 31...	1310	40	20300	7.9	10.0	4100	4000	820	510	3800
FEB 17...	1200	33	21600	7.5	13.0	4400	4200	870	540	3700
MAR 31...	0900	40	17700	7.6	16.0	1900	1800	260	310	2900
APR 30...	1730	19	22200	7.1	28.0	3900	3800	810	450	4900
JUN 30...	1040	18	24900	7.1	26.0	5000	5000	930	660	4500
JUL 31...	1635	12	26600	7.0	33.0	5500	5500	1100	680	3400
AUG 11...	1210	11	22000	6.9	28.0	4500	4500	950	520	4100
SEP 30...	1145	16	19500	7.1	27.0	3800	3800	770	460	3500

DATE	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED SILICA (SI02) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)
OCT 08...	21	56	66	0	2700	4600	.0	11100	--
DEC 31...	26	54	218	0	3200	6100	8.9	14600	--
FEB 17...	24	60	210	0	3300	6400	7.2	15000	--
MAR 31...	29	57	150	0	2600	3800	2.0	10000	.02
APR 30...	34	47	88	0	3700	7500	2.4	17500	.30
JUN 30...	28	67	56	0	4300	7400	6.7	17900	.15
JUL 31...	20	95	45	0	4700	5400	3.1	15400	.08
AUG 11...	27	81	64	0	4000	6800	6.6	16500	.20
SEP 30...	25	70	68	0	3400	5800	4.4	14000	.12

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	632	16800	11400	19500	4690	8000	2900	4950	****
NOV. 1976.....	1066	19300	13600	39200	5530	15900	3340	9610	****
DEC. 1976.....	1079	19400	13700	39800	5560	16200	3350	9770	****
JAN. 1977.....	1110	21200	15100	45300	6130	18400	3650	11000	****
FEB. 1977.....	913	21600	15500	38100	6270	15500	3730	9190	****
MAR. 1977.....	1195	21700	15500	50000	6300	20300	3740	12100	****
APR. 1977.....	979	18500	12900	34100	5250	13900	3190	8430	****
MAY 1977.....	448.8	19500	13800	16700	5590	6780	3370	4090	****
JUNE 1977.....	369.3	20400	14500	14500	5890	5870	3530	3520	****
JULY 1977.....	369.4	25700	18700	18700	7590	7570	4420	4410	****
AUG. 1977.....	364.1	23600	17100	16800	6930	6810	4070	4000	****
SEPT 1977.....	519.5	22000	15700	22100	6390	8960	3790	5310	****
TOTAL .....	9045.09	**	**	355000	**	144000	**	86400	**
WTD.AVG. ....	24.78	20500	15000	**	5900	**	3500	**	*****

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17100	18300	19300	20700	21500	22300	17800	22700	19800	23700	28500	25000
2	16800	18200	19600	20800	21400	22500	18000	22100	19500	23600	28700	25500
3	16600	19400	19900	21000	21600	22600	16600	21000	19900	24100	28600	26000
4	16500	19200	19000	20600	21500	22400	16900	20900	20000	24800	28800	25700
5	16700	19000	18800	21200	21300	22400	17200	20600	19900	25500	25300	26200
6	16900	19100	18600	21500	21200	22300	17500	20500	20500	26000	24700	24700
7	16700	19100	18700	21200	21300	22200	17800	20400	20600	26100	23600	22900
8	16700	18700	18600	21100	21100	22300	18200	20600	20800	25900	23500	21400
9	16500	19400	18600	21000	21000	22200	18500	20800	20900	25400	22900	21300
10	16000	19300	18700	21000	21100	23800	19200	20700	21300	25200	22000	21300
11	15800	19400	18800	21100	20700	23100	19600	20800	19900	25100	22200	23500
12	15700	19600	19000	21100	21100	23400	19900	20400	19800	25400	21700	23100
13	15500	19300	19100	20900	21200	23100	20200	20000	19800	25900	21900	22800
14	14800	19900	19200	20800	21100	23400	19700	19500	19200	25600	22300	22500
15	14500	20000	19300	21000	21400	23100	17800	18900	19700	25300	21000	22200
16	15100	20100	19200	21000	21600	22600	12500	18200	18300	25100	19700	22500
17	16200	19900	19200	21100	21500	23000	15900	17600	17300	24800	19900	22500
18	16500	19300	19600	21300	21600	23700	19200	18400	17400	25100	20100	22200
19	17000	19900	19800	21200	21800	24000	19600	18300	17200	24700	20800	22400
20	16900	19700	19700	21300	21900	24100	19500	18200	17300	24400	21000	21600
21	17200	19500	19800	21600	22000	23800	19600	18600	18000	24500	20900	21300
22	17300	19400	19900	21300	21900	23000	17300	17800	18500	24800	21000	21000
23	17200	19300	20100	21400	22100	22600	18000	18600	19700	24600	21100	20800
24	17400	18800	19900	21400	22700	22400	19200	18400	19900	25800	21300	20600
25	17500	18300	20000	21300	22500	22000	19600	18200	20300	27400	21800	20300
26	17000	19900	19900	21300	22700	19800	20200	18300	20700	28000	21500	19800
27	16700	19800	19700	21400	22500	19400	20800	18400	20900	28100	21600	18700
28	18100	19800	20100	21300	22500	18900	21500	17900	22900	27600	22500	18400
29	17200	19500	19900	21400	---	17400	21600	18900	25200	27500	24200	19200
30	18400	18600	19800	21500	---	16400	22400	19200	24200	27000	24100	19600
31	18600	---	20100	21600	---	15900	---	19400	---	26800	25000	---
MEAN	16700	19300	19400	21200	21600	21900	18700	19500	20000	25600	23000	22200

## RIO GRANDE BASIN

505

08446500 PECOS RIVER NEAR GIRVIN, TX.--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25.0	15.0	8.0	8.0	11.0	17.0	21.0	29.0	31.0	33.0	30.0	31.0
2	25.0	18.0	9.0	7.0	11.0	20.0	16.0	30.0	34.0	32.0	29.0	30.0
3	27.0	19.0	5.0	12.0	12.0	14.0	20.0	30.0	28.0	31.0	34.0	30.0
4	27.0	13.0	12.0	12.0	11.0	11.0	17.0	29.0	---	30.0	29.0	31.0
5	24.0	19.0	13.0	9.0	13.0	12.0	19.0	27.0	30.0	33.0	30.0	27.0
6	22.0	22.0	9.0	9.0	15.0	14.0	21.0	27.0	30.0	32.0	30.0	26.0
7	15.0	18.0	10.0	8.0	12.0	19.0	20.0	30.0	31.0	33.0	31.0	30.0
8	18.0	18.0	11.0	10.0	12.0	17.0	21.0	29.0	27.0	32.0	30.0	31.0
9	15.0	19.0	11.0	6.0	12.0	18.0	18.0	29.0	27.0	33.0	30.0	30.0
10	20.0	19.0	11.0	5.0	12.0	23.0	21.0	23.0	29.0	33.0	29.0	31.0
11	22.0	17.0	9.0	6.0	14.0	17.0	21.0	29.0	24.0	30.0	29.0	30.0
12	22.0	11.0	8.0	8.0	14.0	17.0	17.0	25.0	30.0	31.0	29.0	29.0
13	22.0	8.0	9.0	10.0	14.0	19.0	24.0	26.0	34.0	31.0	28.0	27.0
14	23.0	7.0	13.0	10.0	12.0	21.0	22.0	27.0	25.0	25.0	29.0	30.0
15	23.0	10.0	13.0	11.0	14.0	19.0	23.0	29.0	34.0	33.0	32.0	29.0
16	19.0	8.0	12.0	7.0	13.0	18.0	20.0	27.0	34.0	32.0	33.0	27.0
17	19.0	10.0	14.0	9.0	14.0	19.0	22.0	27.0	29.0	32.0	33.0	28.0
18	20.0	15.0	13.0	9.0	17.0	19.0	25.0	27.0	34.0	32.0	33.0	31.0
19	17.0	12.0	14.0	5.0	14.0	20.0	24.0	27.0	32.0	30.0	33.0	30.0
20	19.0	15.0	11.0	10.0	17.0	20.0	24.0	27.0	25.0	33.0	33.0	29.0
21	17.0	12.0	8.0	12.0	16.0	17.0	21.0	29.0	29.0	32.0	34.0	29.0
22	17.0	14.0	12.0	12.0	18.0	18.0	24.0	29.0	25.0	31.0	34.0	30.0
23	19.0	15.0	9.0	12.0	18.0	14.0	19.0	28.0	29.0	32.0	33.0	27.0
24	20.0	10.0	11.0	11.0	10.0	12.0	25.0	28.0	25.0	33.0	27.0	32.0
25	19.0	18.0	10.0	12.0	19.0	17.0	25.0	28.0	26.0	33.0	26.0	30.0
26	20.0	17.0	10.0	14.0	17.0	18.0	25.0	28.0	33.0	33.0	32.0	31.0
27	16.0	10.0	10.0	13.0	17.0	16.0	25.0	31.0	---	30.0	30.0	29.0
28	13.0	7.0	12.0	13.0	16.0	18.0	25.0	25.0	31.0	31.0	32.0	27.0
29	13.0	8.0	13.0	10.0	---	20.0	27.0	31.0	31.0	26.0	28.0	26.0
30	15.0	8.0	10.0	---	---	15.0	28.0	33.0	31.0	29.0	28.0	27.0
31	18.0	---	10.0	10.0	---	16.0	---	28.0	---	33.0	32.0	---
MEAN	19.5	13.5	10.5	9.5	14.0	17.5	22.0	28.0	29.5	31.5	30.5	29.0

## RIO GRANDE BASIN

08447000 PECOS RIVER NEAR SHEFFIELD, TX  
(Reconnaissance partial-record station)

LOCATION.--Lat 30°39'34", Long 101°46'11", Pecos-Crockett County line, Hydrologic Unit 13070008, at U.S. Highway 290, 3.8 mi (6.1 km) southeast of Sheffield, and 4 mi (6 km) upstream from Live Oak Creek.

DRAINAGE AREA.--31,600 mi<sup>2</sup> (81,800 km<sup>2</sup>), approximately (contributing area).

PERIOD OF RECORD.--Occasional discharge measurements: October 1921 to April 1925, October 1968 to current year. Operated as a daily discharge station October 1939 to September 1949. Occasional water-quality data: November 1939 to June 1941, October 1946 to September 1947, October 1968 to September 1977 (discontinued).

## DISCHARGE AND WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)
OCT 04...	1135	61	9950	7.7	22.0	1900	1700	390	220
NOV 16...	1155	54	12000	7.6	11.0	2400	2300	490	290
JAN 03...	1135	56	14500	7.8	8.0	2900	2700	630	330
FEB 14...	1130	54	15700	7.7	13.0	3300	3100	680	390
MAR 28...	1040	59	17100	7.4	15.0	2900	2800	630	330
MAY 09...	1210	30	9950	7.7	24.0	1800	1600	360	220
JUN 27...	1110	17	6110	--	26.0	--	--	--	--
AUG 08...	1130	13	5960	7.8	25.5	1200	970	230	140

DATE	DIS-SOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
OCT 04...	1700	17	26	184	0	1500	2700	8.0	6630
NOV 16...	2000	18	34	174	0	2000	3300	6.1	8210
JAN 03...	2600	21	40	228	0	2300	4200	6.1	10200
FEB 14...	2900	22	39	218	0	2500	4600	4.9	11200
MAR 28...	3000	24	19	200	0	2400	4800	4.9	11300
MAY 09...	1600	16	20	200	0	1600	2500	9.8	6410
JUN 27...	--	--	--	230	0	790	1500	--	--
AUG 08...	920	12	14	220	0	800	1600	17	3830

## RIO GRANDE BASIN

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08447020 INDEPENDENCE CREEK NEAR SHEFFIELD, TX

LOCATION.--Lat 30°27'07", long 101°43'58", Terrell County, Hydrologic Unit 13070010, on left bank 0.5 mi (0.8 km) downstream from Joe Chandler Ranch Headquarters, 1.0 mi (1.6 km) upstream from mouth, 6 mi (10 km) downstream from bridge on Farm Road 1217, and 17 mi (27 km) southeast of Sheffield.

DRAINAGE AREA.--763 mi<sup>2</sup> (1,976 km<sup>2</sup>).

PERIOD OF RECORD.--January 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,883 ft (574 m) above mean sea level, by topographic division plane table survey.

REMARKS.--Records good. The Chandler Estate and the Roden Ranch have permits to divert 243 acre-ft (300,000 m<sup>3</sup>) and 530 acre-ft (653,000 m<sup>3</sup>) annually, respectively. National Weather Service rain gage and gage-height Satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 78,100 ft<sup>3</sup>/s (2,210 m<sup>3</sup>/s) Sept. 20, 1974, gage height, 16.74 ft (5.102 m), from rating curve extended above 130 ft<sup>3</sup>/s (3.68 m<sup>3</sup>/s) on basis of slope-area measurement of peak flow; minimum, 13 ft<sup>3</sup>/s (0.37 m<sup>3</sup>/s) July 26, 1974.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1900, about 22 ft (6.7 m) June 28, 1954, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,200 ft<sup>3</sup>/s (317 m<sup>3</sup>/s) Apr. 15, gage height, 8.70 ft (2.652 m), from floodmark; no other peak above base of 700 ft<sup>3</sup>/s (19.8 m<sup>3</sup>/s); minimum, 18 ft<sup>3</sup>/s (0.51 m<sup>3</sup>/s) Jan. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	46	33	31	28	21	23	50	30	25	25	23
2	25	46	33	31	28	21	23	48	29	25	26	22
3	25	43	33	32	27	21	23	45	28	25	26	21
4	55	41	34	29	24	21	23	43	28	24	24	20
5	41	41	34	28	24	21	23	45	28	24	23	22
6	37	40	34	29	24	22	22	48	28	25	23	23
7	36	40	34	29	25	23	22	43	28	24	23	23
8	36	40	33	29	25	23	22	43	29	25	23	25
9	36	39	32	29	25	23	22	44	28	27	23	25
10	36	39	31	29	25	24	22	43	27	26	21	24
11	35	38	33	29	25	24	23	43	27	25	22	24
12	35	36	33	30	25	24	22	39	28	24	22	27
13	35	35	34	30	25	24	22	39	29	24	22	24
14	35	35	34	29	25	23	74	39	28	24	23	23
15	35	35	32	26	24	23	926	39	27	24	24	23
16	35	35	33	25	24	22	76	39	27	25	22	22
17	34	35	33	25	24	24	68	39	26	25	22	22
18	34	35	33	26	24	24	65	37	25	25	23	23
19	34	35	33	28	24	24	64	37	24	26	23	23
20	33	34	33	30	24	24	63	37	25	25	23	23
21	33	34	33	30	24	24	58	37	36	25	22	22
22	33	35	33	31	24	22	55	35	30	25	21	21
23	33	35	33	31	22	22	53	35	26	24	21	19
24	33	35	33	30	21	22	53	35	26	24	21	19
25	33	35	32	30	21	23	51	35	26	25	22	20
26	33	35	31	30	21	25	50	34	26	25	22	20
27	36	34	31	29	21	25	50	34	26	25	22	21
28	45	34	31	28	21	24	49	33	26	25	23	23
29	76	33	31	27	---	24	55	33	25	28	22	24
30	49	33	31	27	---	24	50	32	25	27	21	23
31	46	---	31	28	---	24	---	31	---	25	22	---
TOTAL	1147	1111	1012	895	674	715	2152	1214	821	775	702	674
MEAN	37.0	37.0	32.6	28.9	24.1	23.1	71.7	39.2	27.4	25.0	22.6	22.5
MAX	76	46	34	32	28	25	926	50	36	28	26	27
MIN	25	33	31	25	21	21	22	31	24	24	21	19
AC-FT	2280	2200	2010	1780	1340	1420	4270	2410	1630	1540	1390	1340
CAL YR 1976	TOTAL	11634	MEAN	31.8	MAX	448	MIN	20	AC-FT	23080		
WTR YR 1977	TOTAL	11892	MEAN	32.6	MAX	926	MIN	19	AC-FT	23590		



## RIO GRANDE BASIN

08447410 PECOS RIVER NEAR LANGTRY, TX  
(National stream-quality accounting network)

LOCATION.--Lat 29°48'10", long 101°26'45", Val Verde County, Hydrologic Unit 13040212, at gaging station 7.4 mi (12.1 km) east of Langtry, 15.0 mi (24.1 km) upstream from confluence with the Rio Grande, and 638.2 mi (1,026.9 km) downstream from the American Dam at El Paso.

DRAINAGE AREA.--35,179 mi<sup>2</sup> (91,114 km<sup>2</sup>).

PERIOD OF RECORD.--Chemical analyses: October 1954 to current year. Chemical and biochemical analyses: October 1974 to current year.

REMARKS.--Records of specific conductance and discharge for water year 1977 are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	RIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)
OCT										
01-31	--	385	2310	8.1	--	--	--	--	--	--
19...	0845	298	2320	7.6	16.0	4	9.2	97	.1	180
NOV										
01-30	--	443	2210	8.0	--	--	--	--	--	--
17...	0900	451	2250	8.0	11.5	2	10.3	98	.4	92
DEC										
01-31	--	327	3050	8.1	--	--	--	--	--	--
15...	0845	345	2940	7.9	10.5	2	10.3	96	3.0	12
JAN										
26...	0840	275	3470	7.9	12.0	1	10.0	97	.6	22
FEB										
23...	0830	265	3600	8.1	15.0	2	9.1	94	.4	200
MAR										
23...	0835	243	3770	8.0	14.5	3	9.3	95	.5	120
APR										
26...	0830	348	3060	7.9	21.5	25	7.9	93	.9	190
MAY										
25...	0830	246	2880	8.2	23.5	25	8.2	99	.4	56
JUN										
22...	0830	220	2430	8.2	24.5	15	7.4	91	.6	360
JUL										
27...	0820	186	2160	8.2	29.0	15	7.4	97	.2	47
AUG										
23...	0830	175	2020	8.3	29.0	10	7.3	96	.8	160
SEP										
21...	0830	176	1990	8.1	27.0	15	7.5	96	.2	36

08447410 PECOS RIVER NEAR LANGTRY, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	FECAL COLI- FORM (COL./ 100 ML)	FECAL STREP- TOCOC KF AGAR (COL. PER 100 ML)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PD- TAS- SIUM (K) (MG/L)
OCT									
01-31	--	--	480	320	110	49	300	6.0	--
19...	12	240	490	330	110	51	290	5.7	6.0
NOV									
01-30	--	--	460	290	110	45	280	5.7	--
17...	12	160	470	300	110	48	280	5.6	5.8
DEC									
01-31	--	--	620	450	140	65	420	7.4	--
15...	6	18	--	--	--	--	--	--	--
JAN									
26...	11	48	700	540	160	73	460	7.6	8.0
FEB									
23...	9	45	740	580	170	76	520	8.3	8.1
MAR									
23...	4	32	--	--	--	--	--	--	--
APR									
26...	40	98	630	470	150	61	420	7.3	8.4
MAY									
25...	18	140	540	400	120	59	380	7.1	7.5
JUN									
22...	40	300	480	350	110	49	330	6.6	6.4
JUL									
27...	8	200	--	--	--	--	--	--	--
AUG									
23...	10	190	400	280	91	43	260	5.6	5.7
SEP									
21...	10	140	400	280	90	43	250	5.4	5.3

DATE	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)
OCT									
01-31	192	0	280	480	--	17	--	1340	--
19...	192	0	280	490	.7	16	1440	1340	1.9
NOV									
01-30	204	0	260	470	--	16	--	1290	--
17...	208	0	260	450	.7	16	--	1270	2.2
DEC									
01-31	198	0	380	660	--	15	--	1790	--
15...	--	--	--	--	--	--	--	--	2.0
JAN									
26...	200	0	440	800	.7	13	2150	2050	1.1
FEB									
23...	192	0	460	840	.7	14	2300	2180	1.9
MAR									
23...	--	--	--	--	--	--	--	--	1.8
APR									
26...	188	0	370	680	.6	16	1940	1800	1.8
MAY									
25...	170	0	350	610	.8	17	1770	1630	1.6
JUN									
22...	150	0	280	570	.9	17	1500	1440	.60
JUL									
27...	--	--	--	--	--	--	--	--	1.1
AUG									
23...	150	0	230	430	.8	20	1230	1150	1.2
SEP									
21...	150	0	210	420	.8	19	1200	1110	.58

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TOTAL NITRITE (N) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUS- PEN- DED SEDI- MENT (MG/L)	SUS- PEN- DED SEDI- MENT CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT									
01-31	--	1.8	--	--	--	--	--	--	--
19...	.01	--	.02	.29	.01	10	18	14	75
NOV									
01-30	--	1.9	--	--	--	--	--	--	--
17...	.00	--	.02	.25	.00	--	4	4.9	94
DEC									
01-31	--	1.9	--	--	--	--	--	--	--
15...	.00	--	.01	.27	.01	--	12	11	72
JAN									
26...	.00	--	.01	.27	.00	--	3	2.2	1
FEB									
23...	.01	--	.03	.21	.00	3.4	8	5.7	81
MAR									
23...	.01	--	.04	.17	.01	--	70	46	64
APR									
26...	.01	--	.03	.77	.03	--	40	38	99
MAY									
25...	.02	--	.03	.48	.02	--	38	25	98
JUN									
22...	.01	--	.06	.44	.02	2.6	20	12	88
JUL									
27...	.01	--	.02	.51	.02	--	18	9.0	99
AUG									
23...	.02	--	--	--	.01	.9	18	8.5	95
SEP									
21...	.00	--	--	--	.03	2.8	18	8.6	98

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	DIS- SOLVED BORON (B) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)
OCT										
01-31	--	--	--	--	--	190	--	--	--	--
19...	0845	1	1	--	300	--	0	0	<10	0
NOV										
01-30	--	--	--	--	--	180	--	--	--	--
DEC										
01-31	--	--	--	--	--	200	--	--	--	--
FEB										
23...	0830	0	0	--	200	--	0	0	30	5
JUN										
22...	0830	1	1	--	200	--	<10	1	10	0
AUG										
23...	0830	1	1	400	400	--	<10	1	20	0

DATE	TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)
OCT									
01-31	--	--	--	--	--	--	--	--	--
19...	2	0	0	0	150	10	3	0	20
NOV									
01-30	--	--	--	--	--	--	--	--	--
DEC									
01-31	--	--	--	--	--	--	--	--	--
FEB									
23...	0	0	3	0	50	0	3	0	10
JUN									
22...	<50	0	<10	0	110	10	<100	0	10
AUG									
23...	<50	0	<10	0	120	10	<100	0	10

DATE	DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
OCT									
01-31	--	--	--	--	--	--	--	--	--
19...	10	.1	.0	1	1	--	0	30	10
NOV									
01-30	--	--	--	--	--	--	--	--	--
DEC									
01-31	--	--	--	--	--	--	--	--	--
FEB									
23...	10	.0	.0	0	0	--	0	10	0
JUN									
22...	8	.0	.0	2	2	--	0	2	4
AUG									
23...	0	.0	.0	2	0	<10	0	10	10

RIO GRANDE BASIN

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08447410 PECOS RIVER NEAR LANGTRY, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL ALDRIN (UG/L)	TOTAL CHLOR- DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI- AZINON (UG/L)	TOTAL DI- ELDRIN (UG/L)
NOV 17...	0900	ND	ND	ND	ND	ND	ND	ND
JAN 26...	0840	ND	ND	ND	ND	ND	ND	ND
APR 26...	0830	ND	ND	ND	ND	ND	ND	ND
AUG 23...	0830	ND	ND	ND	ND	ND	ND	ND

DATE	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTA- CHLOR (UG/L)	TOTAL HEPTA- CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA- THION (UG/L)	TOTAL METH- OXY- CHLOR (UG/L)	TOTAL METHYL PARA- THION (UG/L)	TOTAL METHYL TRI- THION (UG/L)
NOV 17...	ND	ND	ND	ND	ND	ND	ND	ND	ND
JAN 26...	ND	ND	ND	ND	ND	ND	ND	ND	ND
APR 26...	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 23...	ND	ND	ND	ND	ND	ND	ND	ND	ND

DATE	TOTAL PARA- THION (UG/L)	TOTAL TOX- APHENE (UG/L)	TOTAL TRI- THION (UG/L)	TOTAL ATRA- ZINE (UG/L)	SIMA- ZINE TOTAL COUL- SON COND. (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
NOV 17...	ND	ND	ND	ND	ND	ND	ND	ND
JAN 26...	ND	ND	ND	--	--	--	--	--
APR 26...	ND	ND	ND	ND	ND	ND	ND	ND
AUG 23...	ND	ND	ND	--	--	ND	ND	ND

08447410 PECOS RIVER NEAR LANGTRY, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 19,76 0845	NOV 17,76 0900	DEC 15,76 0845	JAN 26,77 0840	FEB 23,77 0830					
TOTAL CFLLS/ML	61000	370	93	620	2800					
DIVERSITY: DIVISION	0.5	0.8	0.8	1.3	0.7					
..CLASS	0.5	0.8	0.8	1.3	0.7					
...ORDER	0.7	1.0	1.0	1.3	1.0					
...FAMILY	0.8	3.0	2.4	2.1	1.3					
....GENUS	0.8	3.4	2.8	2.1	1.4					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....OOCYSTACEAE	--	-	--	-	--	-	--	-	--	-
...HYDRODICTYACEAE										
....PEDIASTRUM	--	-	--	-	--	-	25	4	--	-
....OOCYSTACEAE										
....ANKISTRODESMUS	--	-	9	2	--	-	4	1	--	-
....CHODATELLA	--	-	--	-	--	-	--	-	--	-
....DICTYOSPHAERIUM	--	-	--	-	--	-	--	-	--	-
....NEPHROCYTIUM	--	-	--	-	--	-	--	-	--	-
....OOCYSTIS	--	-	--	-	19#	20	--	-	--	-
...SCENEDESMACEAE										
....SCENEDESMUS	--	-	63#	17	--	-	25	4	--	-
...VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	--	-	9	2	--	-	*	0	*	0
...ZYGNEATALES										
....DESMIDIACEAE										
....CLOSTERIUM	--	-	--	-	--	-	--	-	--	-
....COSMARIUM	--	-	--	-	5	5	--	-	*	0
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCAEAE										
....CYCLOTELLA	870	1	3	1	--	-	4	1	--	-
....MELOSIRA	2300	4	--	-	--	-	--	-	--	-
...PENNALES										
....ACHNANTHACEAE										
....ACHNANTHES	--	-	34	9	7	7	28	5	92	3
....COCCONEIS	--	-	--	-	--	-	--	-	--	-
...CYMBELLACEAE										
....AMPHORA	--	-	11	3	5	5	4	1	*	0
....CYMBELLA	--	-	26	7	21#	22	78	13	180	6
...DIATOMACEAE										
....DIATOMA	580	1	6	2	--	-	--	-	--	-
...EUNOTIACEAE										
....EUNOTIA	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE										
....FRAGILARIA	--	-	51	14	16#	17	--	-	--	-
....SYNEDRA	--	-	14	4	--	-	39	6	--	-
...GOMPHONEMATAEAE										
....GOMPHONEMA	--	-	3	1	--	-	--	-	*	0
...NAVICULACEAE										
....CALONEIS	--	-	--	-	--	-	--	-	*	0
....DIPLONEIS	--	-	--	-	--	-	--	-	--	-
....GYROSIGMA	--	-	--	-	--	-	4	1	--	-
...MASTOGLIOIA										
....NAVICULA	2000	3	3	1	--	-	--	-	--	-
....NEIDIUM	--	-	74#	20	--	-	4	1	35	1
...PINNULARIA	--	-	--	-	--	-	--	-	--	-
....NITZSCHIAEAE	580	1	--	-	--	-	--	-	--	-
....DENTICULA	--	-	29	8	9	10	4	1	58	2
....NITZSCHIA	1200	2	34	9	12	13	32	5	63	2
...SURIPELLACEAE										
....SURIPELLA	--	-	3	1	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## RIO GRANDE BASIN

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08447410 PECOS RIVER NEAR LANGTRY, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 19,76 0845		NOV 17,76 0900		DEC 15,76 0845		JAN 26,77 0840		FEB 23,77 0830	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
..CHROCOCCALES										
..CHROCOCCACEAE										
....AGMENELLUM	--	-	--	-	--	-	370# 60		2200# 77	
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES										
..NOSTOCACEAE										
....ANABAENA	--	-	--	-	--	-	--	-	--	-
..OSCILLATORIA										
....LYNGBYA	--	-	--	-	--	-	--	-	--	-
..OSCILLATORIA	53000#	88	--	-	--	-	--	-	170	6
..HORMOGONALES	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
..CRYPTOMONIDALES										
..CRYPTOMONODACEAE										
..CRYPTOMONAS	--	-	--	-	--	-	--	-	*	0
..EUGLENOPHYCEAE										
..EUGLENALES										
..EUGLENACEAE										
....EUGLENA	--	-	--	-	--	-	*	0	--	-
....TRACHELOMONAS	--	-	3	1	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
..PERIDINIALES										
..GLENODINIACEAE										
..GLENODINIUM	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%



08447410 PECOS RIVER NEAR LANGTRY, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	MAY 25,77 0830	JUN 22,77 0830	JUL 27,77 0820	AUG 23,77 0830	SEP 21,77 0830
TOTAL CELLS/ML	710	480	340	3900	190
DIVERSITY: DIVISION	1.4	1.6	1.3	1.0	0.3
..CLASS	1.4	1.6	1.3	1.0	0.3
..ORDER	1.6	1.9	2.0	2.0	0.3
...FAMILY	2.4	3.2	0.0	2.2	2.7
....GENUS	0.0	3.5	0.0	2.3	3.0

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....OOCYSTACEAE	91	13	--	-	--	-	--	-	--	-
...HYDRODICTYACEAE										
....PEDIASTRUM	52	7	57	12	--	-	--	-	--	-
....OOCYSTACEAE										
...ANKISTRODESMUS	13	2	--	-	6	2	--	-	--	-
....CHODATELLA	--	-	--	-	--	-	29	1	--	-
...DICTYOSPHAERIUM	72	10	--	-	--	-	--	-	--	-
...NEPHROCYTIUM	13	2	--	-	--	-	--	-	--	-
....OOCYSTIS	16	2	--	-	6	2	--	-	--	-
...SCENEDESMACEAE										
....SCENEDESMUS	94	13	49	10	44	13	--	-	11	6
...VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	7	1	--	-	--	-	38	1	--	-
...ZYGNEMATALES										
...DESMIDIACEAE										
...CLOSTERIUM	--	-	--	-	--	-	58	1	--	-
...COSMARIIUM	*	0	28	6	6	2	--	-	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCAEAE										
...CYCLOTELLA	39	6	7	1	--	-	120	3	--	-
....MELOSIRA	--	-	--	-	--	-	330	8	--	-
...PENNALIS										
...ACHNANTHACEAE										
....ACHNANTHES	*	0	--	-	--	-	--	-	5	3
....COCCONEIS	--	-	14	3	--	-	38	1	16	8
...CYMBELLACEAE										
....AMPHORA	--	-	42	9	*	0	58	1	32#	17
....CYMBELLA	--	-	42	9	*	0	--	-	16	8
...DIATOMACEAE										
....DIATOMA	--	-	42	9	--	-	86	2	32#	17
...FUNOTIACEAE										
....FUNOTIA	7	1	--	-	--	-	--	-	--	-
...FRAGILARIACEAE										
....FRAGILARIA	*	0	--	-	17	5	58	1	--	-
...SYNEDRA	--	-	--	-	--	-	*	0	5	3
...GOMPHONEMACEAE										
....GOMPHONEMA	--	-	78#	16	--	-	*	0	21	11
...NAVICULACEAE										
....CALONEIS	--	-	--	-	--	-	--	-	--	-
....DIPLONEIS	--	-	--	-	*	0	--	-	--	-
....GYROSIGMA	--	-	--	-	--	-	--	-	--	-
...MASTOGLOIA										
....NAVICULA	*	0	14	3	11	3	67	2	42#	22
...NEIDIUM	--	-	--	-	--	-	*	0	--	-
...PINNULARIA	--	-	--	-	--	-	--	-	--	-
...NITZSCHACEAE										
....DENTICULA	--	-	--	-	*	0	--	-	--	-
....NITZSCHIA	20	3	7	1	22	7	--	-	11	6
...SURIRELLACEAE										
....SURIRELLA	10	1	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM: EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM. MAY NOT HAVE BEEN COUNTED: LESS THAN 1/2%

08447410 PECOS RIVER NEAR LANGTRY, TX.--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	MAY 25,77 0830		JUN 22,77 0830		JUL 27,77 0820		AUG 23,77 0830		SEP 21,77 0830	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
..CHROCOCCALES										
..CHROCOCCACEAE										
....AGMENELLUM	260#	37	57	12	77#	23	--	-	--	-
....ANACYSTIS	--	-	21	4	--	-	1200#	32	--	-
..HORMOGONALES										
..NOSTOCACEAE										
....ANARAENA	--	-	--	-	33	10	--	-	--	-
..OSCILLATORIA										
....LYNGBYA	--	-	--	-	--	-	1700#	44	--	-
....OSCILLATORIA	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES	--	-	--	-	110#	33	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
..CRYPTOMONIDALES										
..CRYPTOMONODACEAE										
....CRYPTOMONAS	--	-	--	-	--	-	--	-	--	-
..EUGLENOPHYCEAE										
..EUGLENALES										
..EUGLENA	--	-	--	-	--	-	--	-	--	-
..EUGLENA	--	-	--	-	--	-	--	-	--	-
....TRACHELOMONAS	--	-	21	4	--	-	3#	1	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
..PERIDINIALES										
..GLENODINIACEAE										
..GLENODINIUM	--	-	--	-	6	2	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## RIO GRANDE BASIN

08450900 RIO GRANDE BELOW AMISTAD DAM NEAR DEL RIO, TX

LOCATION.--Lat 29°25'30", long 101°27'00", Val Verde County, Hydrologic Unit 13080001, 2.2 mi (3.5 km) downstream from Amistad Dam and 10 mi (16 km) northwest of Del Rio.

DRAINAGE AREA.--123,143 mi<sup>2</sup> (318,940 km<sup>2</sup>).

PERIOD OF RECORD.--Chemical analyses: July 1968 to current year.

REMARKS.--The flow is controlled largely by releases from Amistad Reservoir. Records of daily mean discharge for water year 1977 are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)
OCT										
01-31	--	1250	1020	7.9	--	240	120	68	18	110
NOV										
01-30	--	365	1020	7.7	--	260	140	76	18	110
DEC										
01-31	--	501	1020	8.0	--	260	130	75	18	110
JAN										
01-31	--	178	999	8.1	--	260	130	76	18	110
FEB										
01-28	--	1530	1010	8.0	--	260	130	74	18	110
MAR										
01-31	--	1000	1020	7.7	--	260	130	75	18	110
APR										
01-30	--	2280	1060	8.0	--	270	130	75	19	130
MAY										
01-31	--	8240	1070	8.0	26.0	270	140	80	17	110
JUN										
22...	0720	933	1080	7.6	26.0	280	150	81	19	120
JUL										
20...	0720	1040	1070	7.9	26.0	260	140	71	19	120
AUG										
17...	0715	1210	1110	7.6	--	270	140	77	19	110
SEP										
21...	0720	5300	1090	7.5	18.0	290	160	82	20	120

DATE	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)
OCT										
01-31	3.1	--	148	0	190	120	16	--	596	.20
NOV										
01-30	2.9	--	156	0	190	130	17	--	618	.01
DEC										
01-31	3.0	--	156	0	190	130	16	--	617	.23
JAN										
01-31	2.9	--	160	0	180	120	15	--	598	.09
FEB										
01-28	3.0	--	160	0	180	120	15	--	597	.14
MAR										
01-31	3.0	--	160	0	200	120	16	--	618	.09
APR										
01-30	3.5	--	160	0	200	130	16	--	649	.36
MAY										
01-31	2.9	--	160	0	210	130	14	--	641	.26
JUN										
22...	3.1	--	160	0	220	130	16	654	665	.30
JUL										
20...	3.3	--	140	0	210	130	14	648	634	.17
AUG										
17...	2.9	--	160	0	190	130	17	666	622	.30
SEP										
21...	3.1	5.1	160	0	230	130	17	--	683	--

RIO GRANDE BASIN

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08459000 RIO GRANDE AT LAREDO, TX  
(National stream-quality accounting network)

LOCATION.--Lat 27°29'45", long 99°29'30", Webb County, Hydrologic Unit 13080002, at gaging station 1.1 mi (1.8 km) downstream from the highway bridge between Laredo and Nuevo Laredo, Tamaulipas, Mex., and 891.0 mi (1,433.6 km) downstream from the American Dam at El Paso.

DRAINAGE AREA (revised).--132,578 mi<sup>2</sup> (343,377 km<sup>2</sup>), United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

PERIOD OF RECORD.--Chemical analyses: July 1955 to current year. Chemical, biochemical, and sediment analyses: January 1973 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1974 to current year.

WATER TEMPERATURES: October 1974 to current year.

REMARKS.--Records of discharge for water year 1977 are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,690 micromhos June 1, 1963; minimum daily, 214 micromhos Sept. 26, 1964.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,120 micromhos Apr. 19; minimum daily, 585 micromhos Oct. 30.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	RIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. /100 ML)	FECAL STEP- TOCOCCI KF AGAR (COL. PER 100 ML)
OCT												
01-31	--	3910	778	8.0	--	--	--	--	--	--	--	--
18...	1255	3160	814	8.0	21.5	25	8.4	98	1.0	800	260	120
NOV												
01-30	--	2690	760	8.0	--	--	--	--	--	--	--	--
15...	1330	2640	712	8.0	15.0	5	9.7	99	.7	100	4	130
DEC												
01-31	--	2240	810	8.2	--	--	--	--	--	--	--	--
13...	1245	2500	707	8.0	11.4	15	10.2	96	.4	2700	420	1500
JAN												
10...	1220	3300	865	8.3	9.5	10	10.1	91	.6	180	22	59
FEB												
14...	1230	3530	924	7.9	18.0	20	9.7	105	1.3	360	44	30
MAR												
14...	1225	1980	930	8.1	20.5	30	9.4	107	2.6	84	12	370
APR												
11...	1300	1670	969	8.1	22.0	30	8.2	96	2.4	10000	2600	1600
MAY												
09...	1155	10300	1040	8.1	25.0	60	8.1	100	1.4	20000	820	500
JUN												
06...	1315	3500	1000	7.8	30.0	45	7.7	103	.6	8200	2200	3200
JUL												
11...	1155	2420	936	7.7	28.5	20	7.6	99	1.1	440	150	84
AUG												
15...	1300	802	993	7.7	30.5	25	7.6	101	5.1	74000	4400	23000
SEP												
12...	1400	5400	1034	7.8	28.0	50	7.7	99	.7	2800	210	300

## RIO GRANDE BASIN

08459000 RIO GRANDE AT LAREDO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)
OCT												
01-31	220	92	65	14	70	2.1	--	156	0	--	79	--
18...	240	100	70	16	78	2.2	3.3	172	0	140	85	.3
NOV												
01-30	240	110	71	15	62	1.7	--	156	0	--	80	--
15...	250	96	76	14	59	1.6	2.4	185	0	120	64	.4
DEC												
01-31	310	180	97	17	70	1.7	--	164	0	--	83	--
13...	--	--	--	--	--	--	--	--	--	--	--	--
JAN												
10...	270	120	82	16	76	2.0	3.3	180	0	160	92	.4
FEB												
14...	280	130	85	17	85	2.2	3.5	184	0	170	100	.5
MAR												
14...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
11...	290	150	82	20	100	2.6	3.9	169	0	190	110	.5
MAY												
09...	280	150	82	19	110	2.8	4.4	166	0	200	140	.8
JUN												
06...	270	140	75	19	110	2.9	4.4	150	0	190	120	.8
JUL												
11...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
15...	290	170	84	20	90	2.3	4.5	150	0	200	120	.8
SEP												
12...	270	130	78	19	100	2.6	4.4	170	0	200	110	.8

	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUS- PENDE SEDIM- ENT CHARGE (T/DAY)	SUS- PENDE SEDIM- ENT DIS- CHARGE (T/DAY)	SUS- SED. SIEVE DIAM. % FINER THAN .062 MM
OCT												
01-31	--	--	--	--	--	--	--	--	--	--	--	--
18...	14	463	491	.48	.00	.00	.33	.02	--	55	469	96
NOV												
01-30	--	--	--	--	--	--	--	--	--	--	--	--
15...	13	451	440	.89	.01	.22	1.2	.01	--	13	93	89
DEC												
01-31	--	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	.87	.01	.01	.20	.02	--	61	412	91
JAN												
10...	13	542	531	.67	.00	.03	.26	.01	--	43	383	91
FEB												
14...	14	603	566	.93	.00	.02	.31	.03	3.0	70	667	91
MAR												
14...	--	--	--	.62	.00	.02	.39	.03	--	105	561	95
APR												
11...	15	627	605	.37	.01	.01	.41	.05	6.1	95	428	97
MAY												
09...	15	669	653	.74	.01	.01	.56	.11	--	249	6930	77
JUN												
06...	15	636	608	.31	.00	.01	.49	.05	3.4	69	652	87
JUL												
11...	--	--	--	.43	.00	.02	.15	.03	--	64	418	95
AUG												
15...	20	636	613	.32	.01	.02	.89	.12	--	45	97	93
SEP												
12...	17	648	613	.79	.03	.01	.31	.05	--	142	2070	92

## RIO GRANDE BASIN

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08459000 RIO GRANDE AT LAREDO, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	DIS- SOLVED ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	DIS- SOLVED BARIUM (BA) (UG/L)	TOTAL CAD- MIUM (CD) (UG/L)	DIS- SOLVED CAD- MIUM (CD) (UG/L)	TOTAL CHRO- MIUM (CR) (UG/L)	DIS- SOLVED CHRO- MIUM (CR) (UG/L)
FER 14...	1230	2	2	--	300	0	0	10	1
APR 11...	1300	4	4	--	200	0	0	<10	0
JUN 06...	1315	4	0	--	100	<10	0	0	0
AUG 15...	1300	2	1	200	200	<10	0	10	0

DATE	TOTAL COBALT (CO) (UG/L)	DIS- SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	DIS- SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	DIS- SOLVED LEAD (PB) (UG/L)	TOTAL MAN- GANESE (MN) (UG/L)
FER 14...	0	0	5	2	710	10	260	4	30
APR 11...	0	0	2	2	1000	10	31	0	40
JUN 06...	<50	0	<10	1	1600	20	<100	1	40
AUG 15...	<50	0	20	1	880	10	<100	0	30

DATE	DIS- SOLVED MAN- GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	DIS- SOLVED MERCURY (HG) (UG/L)	TOTAL SELE- NIUM (SE) (UG/L)	DIS- SOLVED SELE- NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	DIS- SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	DIS- SOLVED ZINC (ZN) (UG/L)
FER 14...	0	.1	.1	0	0	--	0	30	0
APR 11...	0	.3	.2	0	0	--	0	10	0
JUN 06...	0	.1	.0	1	0	--	0	10	0
AUG 15...	0	.1	.3	1	0	<10	0	20	4



08459000 RIO GRANDE AT LAREDO, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 18,76 1255	NOV 15,76 1330	DEC 13,76 1245	JAN 10,77 1220	FEB 14,77 1230
TOTAL CELLS/ML	330	190	290	430	1200
DIVERSITY: DIVISION	1.3	0.9	0.2	1.4	1.5
..CLASS	1.3	0.9	0.2	1.5	1.5
...ORDER	1.5	0.9	0.3	1.5	1.8
....FAMILY	2.3	1.2	2.2	2.2	0.0
.....GENUS	2.4	1.2	2.3	2.3	0.0

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....COELASTRACEAE										
.....COELASTRUM	--	-	--	-	--	-	--	-	--	-
....MICRACTINIACEAE										
.....GOLFINKINIA	--	-	--	-	--	-	--	-	*	0
...OOCYSTACEAE										
....ANKISTRODESMUS	--	-	--	-	3	1	--	-	*	0
....CHODATELLA	--	-	--	-	--	-	--	-	--	-
....DICTYOSPHAERIUM	--	-	--	-	--	-	--	-	14	1
....KIRCHNERIELLA	--	-	--	-	--	-	--	-	--	-
....OOCYSTIS	--	-	--	-	--	-	*	0	--	-
....TETRAEDRON	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE										
....ACTINASTRUM	--	-	--	-	--	-	--	-	*	0
....CRUCIGENIA	--	-	--	-	--	-	--	-	--	-
....SCENEDESMUS	--	-	--	-	6	2	13	3	31	3
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CARTERIA	--	-	--	-	--	-	--	-	--	-
....CHLAMYDOMONAS	13	4	--	-	--	-	10	2	10	1
....CHLOROGONIUM	--	-	--	-	--	-	--	-	*	0
...POLYRLEPHARIDACEAE										
....SPERMATOOZOPSIS	--	-	--	-	--	-	--	-	--	-
..ZYGNEMATALES										
...DESMIDIACEAE										
....COSMARIUM	--	-	--	-	3	1	--	-	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...PENNALES										
....NAVICULACEAE										
.....ENTOMONEIS	13	4	--	-	--	-	--	-	--	-
...CENTRALES										
....COSCINODISCACEAE										
.....CYCLOTILLA	13	4	--	-	--	-	--	-	7	1
.....MELOSIRA	--	-	--	-	--	-	--	-	7	1
...PENNALES										
....ACHNANTHACEAE										
.....ACHNANTHES	--	-	--	-	6	2	--	-	28	2
....COCCONEIS	--	-	--	-	*	0	3	1	10	1
...CYMBELLACEAE										
....CYMBELLA	--	-	--	-	*	0	--	-	*	0
....EPITHEMIA	--	-	--	-	3	1	--	-	--	-
...DIATOMACEAE										
....DIATOMA	--	-	--	-	24	8	50	12	--	-
...FRAGILARIACEAE										
....ASTERIONELLA	--	-	--	-	--	-	--	-	7	1
....FRAGILARIA	--	-	--	-	9	3	3	1	--	-
....SYNEDRA	38	12	--	-	6	2	3	1	7	1
...GOMPHONEMATACEAE										
....GOMPHONEMA	--	-	--	-	*	0	--	-	--	-
...NAVICULACEAE										
....GYROSIGMA	--	-	--	-	*	0	--	-	--	-
....NAVICULA	13	4	44#	23	100#	35	10	2	17	1
...NITZSCHACEAE										
....CYLINDROTHECA	--	-	--	-	--	-	--	-	*	0
....NITZSCHIA	160#	50	17	9	120#	40	74#	17	160	13
...SURIPELLACEAE										
....CYMATOPELURA	--	-	--	-	--	-	--	-	7	1
....SURIPELLA	--	-	--	-	12	4	13	3	*	0
..CHRYSOPHYCEAE										
...CHRYSONOMADALES										
....OCHROMONADACEAE										
.....OCHROMONAS	--	-	--	-	--	-	3	1	--	-

NOTE: # - DOMINANT ORGANISM: EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED: LESS THAN 1/2%

## RIO GRANDE BASIN

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08459000 RIO GRANDE AT LAREDO, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 18,76 1255		NOV 15,76 1330		DEC 13,76 1245		JAN 10,77 1220		FEB 14,77 1230	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCCOCCALES										
...CHROCCOCCAEAE										
....AGMENELLUM	--	-	--	-	* 0		--	-	24	2
....ANACYSTIS	50#	15	--	-	--	-	--	-	--	-
..HORMOGONALES										
...NOSTOCACEAE										
....ANABAENA	--	-	--	-	--	-	--	-	--	-
....ANABAENOPSIS	--	-	--	-	--	-	--	-	--	-
....APHANIZOMENON	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIAEAE										
....LYNGBYA	--	-	130#	68	--	-	--	-	--	-
....OSCILLATORIA	--	-	--	-	--	-	230#	54	140	12
....PHORMIDIUM	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES	--	-	--	-	--	-	--	-	580#	49
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
...CRYPTOCHRYSIDACEAE										
....CHROOMONAS	--	-	--	-	--	-	7	2	79	7
...CRYPTOMONODACEAE	--	-	--	-	--	-	3	1	--	-
....CRYPTOMONAS										
..EUGLENOPHYCEAE										
...EUGLENALES										
...EUGLENACEAE										
....EUGLENA	13	4	--	-	--	-	3	1	--	-
....TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...PERIDINIALES										
...GLENODINIACEAE										
....GLENODINIUM	13	4	--	-	--	-	--	-	--	-
RHODOPHYTA (RED ALGAE)										
..RHODOPHYCEAE										
...RHEMALIONALES										
...CHANTRANSICACEAE										
....AUDOUINELLA	--	-	--	-	--	-	--	-	35	3

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## RIO GRANDE BASIN

08459000 RIO GRANDE AT LAREDO, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	MAY 9,77 1155	JUN 6,77 1315	JUL 11,77 1155	AUG 15,77 1300	SEP 12,77 1400
TOTAL CELLS/ML	9700	3100	1500	3400	14000
DIVERSITY: DIVISION	0.8	1.3	0.7	0.1	1.1
..CLASS	0.8	1.4	0.7	0.1	1.1
..ORDER	0.8	1.7	1.3	1.0	1.1
...FAMILY	2.1	2.0	1.7	1.2	1.4
....GENUS	2.6	2.2	1.9	1.3	1.4

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....COELASTRACEAE										
....COELASTRUM	1600#	17	88	3	--	-	--	-	--	-
....MICRACITINIAEAE										
....GOLLENKINIA	--	-	20	1	*	0	--	-	--	-
....OOCYSTACEAE										
....ANKISTRODESUS	100	1	49	2	--	-	--	-	3100#	21
....CHODATELLA	--	-	29	1	--	-	--	-	--	-
....DICTYOSPHAERIUM	1200	13	--	-	--	-	--	-	--	-
....KIRCHNERIELLA	170	2	--	-	--	-	--	-	--	-
....OOCYSTIS	270	3	39	1	--	-	--	-	--	-
....TETRAEDRON	*	0	--	-	--	-	--	-	--	-
....SCENEDESMACEAE										
....ACTINASTRUM	--	-	--	-	--	-	--	-	--	-
....CRUCIGENIA	540	6	78	3	--	-	--	-	--	-
....SCENEDESMUS	4300#	45	300	10	120	8	30	1	--	-
..VOLVOCALES										
....CHLAMYDOMONADACEAE										
....CARTERIA	--	-	110	4	--	-	--	-	--	-
....CHLAMYDOMONAS	--	-	39	1	*	0	--	-	--	-
....CHLOROGONIUM	--	-	--	-	--	-	--	-	--	-
....POLYBLEPHARIDACEAE										
....SPERMATOOZOPSIS	--	-	*	0	--	-	--	-	--	-
..ZYGNEMATALES										
....DESMIDIACEAE										
....COSMARIUM	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...PENNALLES										
....NAVICULACEAE										
....FNTOMONEIS	--	-	--	-	--	-	--	-	--	-
..CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	270	3	20	1	--	-	--	-	--	-
....MELOSIRA	--	-	--	-	--	-	--	-	--	-
...PENNALLES										
....ACHNANTHACEAE										
....ACHNANTHES	--	-	--	-	--	-	--	-	--	-
....COCCONEIS	--	-	--	-	*	0	--	-	--	-
..CYMBELLACEAE										
....CYMBELLA	*	0	--	-	--	-	--	-	--	-
....EPITHEMIA	--	-	--	-	--	-	--	-	--	-
..DIATOMACEAE										
....DIATOMA	*	0	--	-	--	-	--	-	--	-
....FRAGILARIACEAE										
....ASTERIONELLA	--	-	--	-	--	-	--	-	--	-
....FRAGILARIA	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	*	0	--	-	--	-	--	-	1000	7
....GOMPHONEMACEAE										
....GOMPHONEMA	--	-	--	-	--	-	--	-	--	-
....NAVICULACEAE										
....GYROSIGMA	--	-	--	-	--	-	--	-	--	-
....NAVICULA	200	2	20	1	37	2	*	0	--	-
....NITZSCHACEAE										
....CYLINDROTHECA	--	-	--	-	--	-	--	-	--	-
....NITZSCHIA	370	4	260	9	15	1	--	-	9300#	64
....SURIPELLACEAE										
....CYMATOPLEURA	--	-	--	-	--	-	--	-	--	-
....SURIPELLA	--	-	--	-	--	-	--	-	--	-
..CHRYSOPHYCEAE										
...CHRYSOMONADALES										
....OCHROMONADACEAE										
....OCHROMONAS	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM: EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## 523

08459000 RIO GRANDE AT LAREDO, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	MAY 9,77 1155		JUN 6,77 1315		JUL 11,77 1155		AUG 15,77 1300		SEP 12,77 1400	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCCOCCALES										
...CHROCCOCCAEAE										
....AGMENELLUM	540	6	--	-	90	6	900#	26	--	-
....ANACYSTIS	--	-	49	2	190	12	90	3	--	-
..HORMOGONALES										
...NOSTOCACEAE										
....ANABAENA	--	-	--	-	100	7	--	-	--	-
....ANABAENOPSIS	*	0	--	-	--	-	--	-	--	-
....APHANIZOMENON	--	-	--	-	--	-	150	4	--	-
...OSCILLATORIAEAE										
....LYNGBYA	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	--	-	1900#	62	--	-	2200#	65	--	-
....PHORMIDIUM	--	-	--	-	930#	62	--	-	--	-
..HORMOGONALES	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
...CRYPTOCHRYSIDACEAE										
....CHROOMONAS	--	-	--	-	--	-	--	-	--	-
....CRYPTOMONODACEAE										
....CRYPTOMONAS	*	0	39	1	--	-	--	-	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
....EUGLENACEAE										
....EUGLENA	--	-	*	0	--	-	--	-	--	-
....TRACHELOMONAS	--	-	--	-	--	-	--	-	1000	7
PYRRHOPHYTA (FIRE ALGAE)										
..DINOPHYCEAE										
...PERIDINIALES										
...GLENODINIACEAE										
....GLENODINIUM	--	-	--	-	--	-	--	-	--	-
RHODOPHYTA (RED ALGAE)										
..RHODOPHYCEAE										
...RHMALIONALES										
...CHANTRANSICACEAE										
....AUDOUINELLA	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%  
\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## RIO GRANDE BASIN

08459000 RIO GRANDE AT LAREDO, TX.--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	121320	765	460	152000	76	24800	130	43500	240
NOV. 1976.....	80650	756	460	100000	74	16100	130	28400	240
DEC. 1976.....	69460	810	490	92700	83	15600	140	26900	250
JAN. 1977.....	106740	845	520	149000	89	25700	150	44000	260
FEB. 1977.....	87850	860	530	125000	92	21800	160	37000	260
MAR. 1977.....	60800	911	560	91400	100	16400	170	28000	270
APR. 1977.....	81740	963	590	130000	110	24300	180	40500	280
MAY 1977.....	334040	995	610	550000	110	104000	190	174000	290
JUNE 1977.....	96650	1010	620	161000	120	30400	200	50900	290
JULY 1977.....	62070	958	590	98100	110	18300	180	30400	280
AUG. 1977.....	47724	978	600	77200	110	14400	190	24100	280
SEPT 1977.....	139140	1040	640	241000	120	46400	210	77200	300
TOTAL .....	1288184	**	**	1970000	**	358000	**	605000	**
WTD.AVG. ....	3529.27	924	570	**	100	**	170	**	270

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	884	785	749	712	853	886	983	982	1020	951	946	1050
2	839	803	777	659	861	901	950	1050	1030	871	1000	1060
3	773	738	716	850	859	980	944	1030	1030	838	956	1060
4	818	769	744	775	883	876	1000	1000	1040	969	953	1030
5	804	797	720	886	843	911	1000	996	1030	916	965	1040
6	682	707	747	882	890	822	988	1030	1040	940	962	1060
7	749	716	669	779	850	811	932	1020	1020	970	971	1010
8	719	725	768	804	865	866	1010	1020	963	951	971	1000
9	700	748	730	822	796	827	940	1030	955	970	980	1030
10	811	666	732	800	798	895	984	1030	982	968	965	1010
11	823	693	689	875	792	852	984	1010	981	972	958	988
12	826	682	721	879	795	920	992	1050	988	936	983	1010
13	823	724	690	797	829	923	970	1000	940	963	1010	1040
14	817	717	853	818	841	945	987	1010	968	952	1020	1070
15	823	707	862	818	896	871	995	1030	976	967	1020	1060
16	830	687	854	907	912	956	988	1020	1060	971	1030	1050
17	827	703	914	844	859	888	1080	999	967	970	1030	1020
18	826	762	917	801	849	957	1040	962	985	986	1030	1050
19	844	789	1020	904	867	934	1120	976	961	1000	1040	1030
20	782	760	952	908	918	897	1040	1020	991	1010	1040	1060
21	715	805	939	847	847	907	978	1030	1010	1010	1010	1070
22	707	856	913	834	882	917	891	990	999	1040	984	1030
23	689	872	888	852	845	932	871	819	1010	1040	962	1050
24	720	795	863	874	852	932	946	990	1050	1000	980	1060
25	699	890	804	866	924	934	862	982	1040	962	951	1060
26	769	795	796	859	848	926	908	1020	1050	951	966	1050
27	718	783	729	883	913	989	941	1010	1050	942	973	1070
28	697	741	782	904	940	983	927	1030	1090	928	981	1040
29	679	725	754	904	---	933	937	1060	1080	999	979	1070
30	585	749	830	909	---	981	948	1030	1010	954	964	1050
31	741	---	849	878	---	938	---	1000	---	952	958	---
MEAN	765	756	806	843	861	913	971	1010	1010	963	985	1040

RIO GRANDE BASIN

525

08459200 RIO GRANDE AT PIPELINE CROSSING BELOW LAREDO, TX

LOCATION.--Lat 27°24'09", Long 99°29'18", Webb County, Hydrologic Unit 13080002, 8.7 mi (14.0 km) downstream from Texas-Mexican Railway Bridge near Laredo, and at mile 352.69 (567.48 km).

PERIOD OF RECORD.--Chemical analyses: November 1976 to September 1977.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	IMME- DIATE COLI- FORM (COL. PER 100 ML)	FECAL COLI- FORM (COL. /100 ML)	FECAL STREP- TOCOCCI KF AGAR (COL. PER 100 ML)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)
APR 11...	1445	1000	8.1	22.5	7.7	91	3.3	150000	15000	4400	67
MAY 09...	1325	1040	7.8	25.0	7.8	96	1.2	190000	42000	14000	165
JUN 06...	1520	1020	7.7	29.5	7.5	99	2.4	640000	310000	48000	44
JUL 11...	1355	945	7.8	29.0	7.2	95	2.0	20000	8000	6000	64
AUG 15...	1445	1020	8.3	33.5	11.5	160	3.2	92000	7300	4200	22
SEP 12...	1530	1070	7.8	28.5	7.7	100	2.0	69000	4800	9400	186



## RIO GRANDE BASIN

08461200 INTERNATIONAL FALCON RESERVOIR NEAR FALCON HEIGHTS, TX

LOCATION.--Lat 26°33'25", long 99°10'05", Starr County, Hydrologic Unit 13080003, on upstream side of Falcon Dam in International Falcon Reservoir, about 1 mi (2 km) west of Falcon Heights, 75 mi (121 km) downstream from Laredo, and at mile 274.81 (442.17 km)

PERIOD OF RECORD.--Chemical analyses: October 1976 to September 1977.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	PERCENT SATURATION	HARDNESS (CA+MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)
FEB 08...	0935	840	8.4	12.0	9.4	90	230	110
MAY 03...	1227	867	7.9	24.5	7.3	89	250	130

DATE	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)	SODIUM ADSORPTION RATIO	DIS-SOLVED PHOSPHATE (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)
FEB 08...	65	16	78	2.2	4.0	139	0	160	90
MAY 03...	70	18	86	2.4	3.9	145	0	200	94

DATE	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED SILICA (SiO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MANGANESE (MN) (UG/L)
FEB 08...	.4	12	494	.04	.02	.01	10	20
MAY 03...	.6	9.9	554	.17	.00	.00	0	0

RIO GRANDE BASIN

527

08461300 RIO GRANDE BELOW FALCON DAM, TX

LOCATION.--Lat 26°33'25", long 99°10'05", Starr County, Hydrologic Unit 13090001, U.S. Tailrace at Falcon Dam.

DRAINAGE AREA.--159,270 mi<sup>2</sup> (412,509 km<sup>2</sup>), revised, United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

PERIOD OF RECOD.--Chemical analyses: July 1955 to current year.

REMARKS.--Records of specific conductance and discharge for water year 1977 are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)
OCT										
01-31	--	3770	848	7.9	--	230	110	63	17	85
NOV										
01-30	--	1460	852	7.9	--	240	130	67	17	80
DEC										
01-31	--	3910	845	8.0	--	230	120	65	16	80
JAN										
01-31	--	3710	843	8.1	--	240	120	70	15	83
FEB										
01-28	--	3630	841	7.6	--	230	110	65	16	80
MAR										
01-31	--	2310	850	7.8	--	240	130	70	17	84
APR										
01-30	--	6590	866	8.1	--	250	130	70	18	86
MAY										
01-31	--	9180	911	7.8	--	260	140	76	18	90
JUN										
20...	1130	3050	939	8.1	26.0	260	150	76	18	90
JUL										
21...	0930	2020	963	7.8	26.5	240	130	68	18	95
AUG										
15...	0810	3950	982	7.4	28.0	250	140	69	19	96
SEP										
19...	1000	510	1000	7.4	28.5	250	150	68	20	98

DATE	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)
OCT										
01-31	2.5	4.2	140	0	160	91	13	--	502	.02
NOV										
01-30	2.3	--	136	0	160	93	13	--	498	.11
DEC										
01-31	2.3	--	138	0	160	90	13	--	493	.11
JAN										
01-31	2.3	--	140	0	180	88	11	--	516	.03
FEB										
01-28	2.3	--	140	0	160	91	11	--	492	.01
MAR										
01-31	2.3	--	140	0	180	88	12	--	520	.02
APR										
01-30	2.4	--	150	0	170	92	11	--	521	.09
MAY										
01-31	2.4	--	150	0	190	93	9.5	--	551	.12
JUN										
20...	2.4	--	140	0	190	100	11	568	576	4.9
JUL										
21...	2.6	--	140	0	200	100	12	582	563	.08
AUG										
15...	2.6	--	130	0	180	110	12	594	550	.56
SEP										
19...	2.7	4.7	120	0	210	110	12	--	582	--

## RIO GRANDE BASIN

08464700 RIO GRANDE AT FORT RINGGOLD, RIO GRANDE CITY, TX

LOCATION.--Lat 26°22'05", long 98°48'20", Starr County, Hydrologic Unit 13090001, at gaging station about 1 mi (2 km) downstream from Rio Grande City, 3.9 mi (6.3 km) downstream from mouth of Rio San Juan, and 1,014.3 mi (1,632.0 km) downstream from the American Dam at El Paso.

DRAINAGE AREA.--174,362 mi<sup>2</sup> (451,598 km<sup>2</sup>), revised, United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

PERIOD OF RECORD.--Chemical analyses: January 1959 to current year.

REMARKS.--Records of specific conductance and discharge for water year 1977 are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-CHARGE (CFS)	SPE-CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	
OCT 01-31	--	7180	863	8.0	--	220	110	62	17	85	
NOV 01-30	--	3270	953	7.9	--	270	140	75	19	90	
DEC 01-31	--	5950	869	7.9	--	240	130	68	17	80	
JAN 01-31	--	5140	883	7.8	--	250	130	75	16	90	
FEB 01-28	--	5250	877	8.0	--	240	120	68	17	85	
MAR 01-31	--	2680	906	8.0	--	260	130	73	18	91	
APR 01-30	--	6500	884	7.9	--	250	130	70	18	88	
MAY 01-31	--	9480	931	7.6	--	260	140	76	18	92	
JUN 20...	1210	3530	992	7.7	26.0	260	140	74	19	98	
JUL 18...	1230	3140	996	7.9	26.0	260	160	76	18	100	
AUG 15...	1145	4410	990	7.6	30.5	240	140	65	19	98	
SEP 19...	1230	1570	1070	7.2	29.5	280	180	73	24	100	
DATE		SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)
OCT 01-31	2.5	--	136	0	170	94	12	--	508	.12	
NOV 01-30	2.4	--	148	0	180	110	11	--	560	.31	
DEC 01-31	2.2	--	140	0	170	92	12	--	509	.21	
JAN 01-31	2.5	--	150	0	170	96	11	--	533	.11	
FEB 01-28	2.4	--	150	0	170	98	10	--	523	.13	
MAR 01-31	2.5	--	150	0	180	100	11	--	547	.12	
APR 01-30	2.4	--	150	0	180	95	11	--	536	.11	
MAY 01-31	2.5	--	150	0	190	96	9.8	--	556	.01	
JUN 20...	2.6	--	150	0	200	110	11	602	586	.23	
JUL 18...	2.7	--	130	0	210	110	10	596	588	.00	
AUG 15...	2.8	--	120	0	190	120	12	598	563	.02	
SEP 19...	2.6	4.1	120	0	230	130	9.6	--	630	--	

RIO GRANDE BASIN

529

08466300 RIO GRANDE NEAR LOS EBANOS, TX

LOCATION.--Lat 26°14'15", Long 98°33'49", Hidalgo County, Hydrologic Unit 13090001, on Farm Road 886 at U.S. Border Port of Entry near Los Ebanos and at mile 204.37 (328.83 km).

PERIOD OF RECORD.--Chemical analyses: June to September 1977.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DIS- CHARGE (CFS)	SPF- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA,MG) (MG/L)	NON- CAP- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)
JUN 22...	0800	--	1060	7.8	27.0	280	160	80	19	120
JUL 18...	1330	3140	1060	7.8	26.0	270	150	73	20	110
AUG 15...	1300	--	1030	7.7	29.5	260	150	69	21	100
SEP 19...	1330	--	1210	7.2	29.5	310	210	82	26	120

DATE	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SILICA (SI02) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)
JUN 22...	3.1	--	150	0	--	130	--	652	--
JUL 18...	2.9	--	140	0	--	130	14	642	--
AUG 15...	2.7	--	130	0	--	120	--	627	--
SEP 19...	3.0	4.6	130	0	250	160	11	--	718

## 08469200 RIO GRANDE AT ANZALDUAS DAM, TX

LOCATION.--Lat 26°08'00", long 98°20'05", Hidalgo County, Hydrologic Unit 13090002, at gaging station 0.5 mi (0.8 km) downstream from Anzalduas Dam, 12.2 mi (19.6 km) from Hidalgo, and 1,077.1 mi (1,733.1 km) downstream from the American Dam at El Paso.

DRAINAGE AREA.--176,112 mi<sup>2</sup> (456,130 km<sup>2</sup>), revised, United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

PERIOD OF RECORD.--Chemical analyses: March 1959 to current year. Pesticide analyses: October 1968 to September 1971.

REMARKS.--Records of specific conductance and discharge for water year 1977 are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	DIS-CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	
OCT											
01-31	--	6280	956	8.0	--	250	140	70	19	100	
NOV											
01-30	--	3200	1130	7.8	--	290	170	81	22	120	
DEC											
01-31	--	6920	936	8.0	--	260	140	72	19	90	
JAN											
01-31	--	5290	970	8.1	--	260	150	73	19	97	
FEB											
01-28	--	4980	971	8.0	--	270	140	75	19	98	
MAR											
01-31	--	1750	1100	8.2	--	290	160	83	21	120	
APR											
01-30	--	5370	1040	8.0	--	280	160	79	21	110	
MAY											
01-31	--	6810	1070	8.0	--	270	150	76	19	110	
JUN											
18...	--	1420	1190	8.0	26.0	290	170	80	21	140	
JUL											
17...	--	1700	1220	7.8	26.0	310	180	88	23	130	
AUG											
15...	--	1200	1070	7.8	28.0	260	160	71	21	110	
SEP											
19...	1000	1500	987	7.4	--	250	150	73	17	110	
DATE		SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)
OCT											
01-31	2.7	--	144	0	180	120	12	--	573	.14	
NOV											
01-30	3.1	--	156	0	210	150	12	--	675	.57	
DEC											
01-31	2.4	--	148	0	180	110	12	--	557	.29	
JAN											
01-31	2.6	--	140	0	180	120	11	--	572	.59	
FEB											
01-28	2.6	--	150	0	180	120	10	--	578	.53	
MAR											
01-31	3.0	--	160	0	210	140	11	--	664	.47	
APR											
01-30	2.8	--	150	0	200	130	11	--	625	.25	
MAY											
01-31	2.9	--	150	0	210	130	11	--	631	.28	
JUN											
18...	3.6	--	140	0	240	170	10	728	730	.38	
JUL											
17...	3.2	--	160	0	250	150	39	750	759	.01	
AUG											
15...	2.9	--	130	0	220	130	13	642	629	.56	
SEP											
19...	3.0	4.3	120	0	190	140	10	--	603	--	

RIO GRANDE BASIN

531

08470200 NORTH FLOODWAY NEAR SEBASTIAN, TX

LOCATION.--Lat 26°18'51", long 97°46'36", Cameron County, Hydrologic Unit 12110208, at International Boundary and Water Commission gaging station on U.S. Highway 77 and approximately 2 mi (3 km) south of Sebastian.

PERIOD OF RECORD.--Sediment records: February 1966 to current year.

REMARKS.--Records of discharge are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	TEMPER- ATURE (DEG C)	SUS- PENDE SEDI- MENT (MG/L)	SUS- PENDE SEDI- MENT DIS- CHARGE (T/DAY)	SUS. SED. FALL DIAM. % FINER THAN .002 MM	SUS. SED. FALL DIAM. % FINER THAN .004 MM	SUS. SED. FALL DIAM. % FINER THAN .008 MM
AUG 31...	0800	188	27.0	467	237	59	74	83
		SUS. SED. FALL DIAM. % FINER THAN .016 MM	SUS. SED. FALL DIAM. % FINER THAN .031 MM	SUS. SED. FALL DIAM. % FINER THAN .062 MM	SUS. SED. FALL DIAM. % FINER THAN .125 MM	SUS. SED. FALL DIAM. % FINER THAN .250 MM	SUS. SED. FALL DIAM. % FINER THAN .500 MM	SUS. SED. FALL DIAM. % FINER THAN 1.00 MM
AUG 31...		89	92	93	96	97	99	100

MONTHLY AND ANNUAL SUMMARY OF WATER AND SUSPENDED-SEDIMENT DISCHARGE

WATER YEAR, OCTOBER 1976 TO SEPTEMBER 1977

DATE	DISCHARGE (CFS-DAYS)	MEAN WEIGHTED SUSPENDED SEDIMENT CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS)
OCT. 1976...	11082.2	364	10900
NOV. 1976...	13250.0	269	9620
DEC. 1976...	10517.0	124	3510
JAN. 1977...	6560.0	46	819
FEB. 1977...	6095.0	80	1320
MAR. 1977...	5769.0	111	1730
APR. 1977...	6429.0	113	1960
MAY 1977...	4845.0	109	1420
JUNE 1977...	7264.0	184	3610
JULY 1977...	4150.0	132	1480
AUG. 1977...	3645.1	126	1240
SEP. 1977...	3965.0	187	2000
TOTAL.....	83571.3	175	39600



## RIO GRANDE BASIN

08470300 ARROYO COLORADO FLOODWAY AT EL FUSTES SIPHON, SOUTH OF MERCEDES, TX

LOCATION.--Lat 26°07'45", Long 97°54'45", Hidalgo County, Hydrologic Unit 12110208, at International Boundary and Water Commission gaging station, 50 ft (15 m) upstream from Mercedes Canal and Fuste Siphon on Arroyo Colorado, approximately, 1.4 mi (2.3 km) downstream from Arroyo Colorado heading on the main floodway and 1.5 mi (2.4 km) south of Mercedes.

PERIOD OF RECORD.--Chemical analyses: November 1967 to February 1968. Pesticide analyses: May 1968 to September 1973, October 1975 to current year. Sediment records: February 1966 to current year.

REMARKS.--Records of discharge are given in International Boundary and Water Commission Water Bulletins Nos. 46 and 47.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TEMPERATURE (DEG C)	TOTAL PCB (UG/L)	PCB IN BOTTOM MATERIAL (UG/KG)	POLY-CHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL CHLORDANE (UG/L)	CHLORDANE IN BOTTOM MATERIAL (UG/KG)
FEB 15...	0900	160	17.5	.0	0	.00	.00	.0	.0	0
APR 12...	0905	107	23.0	.0	--	.00	.00	--	.0	--
JUN 07...	0915	221	28.0	.0	--	.00	.00	--	.0	--
AUG 16...	0920	73	29.0	.0	2	.00	.00	.0	.0	2

DATE	TOTAL DDD (UG/L)	DDD IN BOTTOM MATERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDT (UG/L)	DDT IN BOTTOM MATERIAL (UG/KG)	TOTAL DIAZINON (UG/L)	TOTAL DIFLORIN (UG/L)	DI-ELDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ENDRIN (UG/L)
FEB 15...	.00	5.8	.00	.2	.00	.9	.01	.00	.2	.00
APR 12...	.00	--	.03	--	.00	--	.01	.01	--	.01
JUN 07...	.00	--	.00	--	.00	--	.06	.01	--	.00
AUG 16...	.00	.8	.04	4.8	.02	.0	.00	.00	.1	.00

DATE	ENDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	HEPTACHLOR IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	HEPTACHLOR EPOXIDE IN BOTTOM MATERIAL (UG/KG)	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL MALATHION (UG/L)
FEB 15...	.2	.00	.00	.0	.00	.0	.00	.0	.00
APR 12...	--	.00	.01	--	.00	--	.00	--	.00
JUN 07...	--	.00	.00	--	.00	--	.00	--	.00
AUG 16...	.0	.00	.00	.0	.00	.0	.00	.0	.00

DATE	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRIETHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOXAPHENE IN BOTTOM MATERIAL (UG/KG)	TOTAL TRIETHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
FEB 15...	.00	.00	.00	0	0	.00	.00	.00	.00
APR 12...	.01	.00	.04	0	--	.00	.00	.00	.00
JUN 07...	.99	.00	.02	0	--	.00	.00	.00	.00
AUG 16...	.00	.00	.00	0	0	.00	.00	.00	.00

08470300 ARROYO COLORADO FLOODWAY AT EL FUSTE SIPHON, SOUTH OF MERCEDES, TX.--Continued

## MONTHLY AND ANNUAL SUMMARY OF WATER AND SUSPENDED-SEDIMENT DISCHARGE

WATER YEAR, OCTOBER 1976 TO SEPTEMBER 1977

DATE	DISCHARGE (CFS-DAYS)	MEAN WEIGHTED SUSPENDED SEDIMENT CONCENTRATION (MG/L)	SUSPENDED SEDIMENT DISCHARGE (TONS)
OCT. 1976...	10042	176	4780
NOV. 1976...	8855	118	2810
DEC. 1976...	5087	82	1120
JAN. 1977...	4796	86	1120
FEB. 1977...	4736	92	1180
MAR. 1977...	4990	148	2000
APR. 1977...	4694.5	95	1200
MAY 1977...	4519	95	1160
JUNE 1977...	5070	86	1180
JULY 1977...	4491	125	1520
AUG. 1977...	3762	122	1240
SEP. 1977...	8537	142	3280
TOTAL.....	69579.5	120	22600

## RIO GRANDE BASIN

08474550 RIO GRANDE AT U.S. HIGHWAY 77 AT BROWNSVILLE, TX

LOCATION.--Lat 25°53'54", long 97°29'51", Cameron County, Hydrologic Unit 12110208, on upstream side of bridge on U.S. Highway 77 in Brownsville and at mile 55.67 (89.57 km).

PERIOD OF RECORD.--Chemical analyses: October 1976 to September 1977.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH  (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	DIS- SOLVED OXYGEN (MG/L)	PER- CENT SATUR- ATION
MAY 10...	1005	6600	1020	7.6	25.0	0	85	7.9	98
JUN 07...	1055	2050	1070	7.8	27.5	0	55	7.7	99
JUL 12...	1005	320	1720	7.4	29.0	10	20	7.6	100
AUG 16...	1055	180	1260	7.3	30.0	10	15	7.7	103
SEP 13...	1015	620	1240	7.9	29.5	20	15	7.1	93
DATE	BIO- CHEM- ICAL OXYGEN DEMAND 5 DAY (MG/L)	FECAL COLI- FORM .7UM-MF (COL./ 100 ML)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	TOTAL NON- FILT- RABLE RESIDUE (MG/L)	VOL. NON- FILT- RABLE RESIDUE (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
MAY 10...	1.7	180	200	120	640	342	36	.16	8.2
JUN 07...	1.0	120	210	130	661	135	24	.12	5.1
JUL 12...	2.9	190	300	260	1090	38	11	.01	6.1
AUG 16...	1.6	300	280	160	800	29	6	.05	3.4
SEP 13...	2.7	230	240	190	779	32	11	.04	4.4

RIO GRANDE BASIN

535

08475000 RIO GRANDE AT BROWNSVILLE, TX  
(National stream-quality accounting network)

LOCATION.--Lat 25°52'35", long 97°27'15", Cameron County, Hydrologic Unit 13090002, at International Boundary and Water Commission gaging station, 1,000 ft (300 m) downstream from El Jardin pumping plant, 6.8 mi (10.9 km) below International Bridge between Brownsville and Matamoros, Tamps., Mex., and 48.8 mi (78.5 km) above the Gulf of Mexico.

DRAINAGE AREA.--176,333 mi<sup>2</sup> (456,702 km<sup>2</sup>).

PERIOD OF RECORD.--Chemical analyses: October 1967 to January 1968, October 1974 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1967 to current year.

WATER TEMPERATURES: October 1966 to current year.

SUSPENDED-SEDIMENT DISCHARGE: February 1966 to current year.

REMARKS.--Records of discharge furnished by International Boundary and Water Commission.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,130 micromhos May 29, 1972; minimum daily, 337 micromhos Sept. 3, 1967.

WATER TEMPERATURES (1966-69, 1970-75): Maximum daily, 33.0°C on many days during summer months; minimum daily, 8.0°C Jan. 10, 1967.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,560 mg/L Sept. 16, 1971; minimum daily mean, 4 mg/L Apr. 26, 1970, Aug. 16, 18, 24, 27, 1977.

SEDIMENT LOADS: Maximum daily, 83,500 tons Sept. 16, 1971; minimum daily, 0.55 tons May 24, 1975.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,880 micromhos July 18; minimum daily, 856 micromhos Apr. 14.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,370 mg/L May 18; minimum daily mean, 4 mg/L Aug. 16, 18, 24, 27.

SEDIMENT LOADS: Maximum daily, 25,600 tons May 2; minimum daily, 0.57 tons Aug. 26.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	PERCENT SATURATION	BIOCHEMICAL OXYGEN DEMAND 5 DAY (MG/L)	IMMEDIATE COLIFORM (COL. PER 100 ML)	FECAL COLIFORM (COL. PER 100 ML)	FECAL STREPTOCOCCI (COL. PER 100 ML)
OCT												
05...	1830	11200	--	--	30.0	--	--	--	--	--	--	--
19...	1110	2750	946	7.4	23.5	0	7.4	89	2.1	1300	180	92
29...	1830	2160	--	--	28.0	--	--	--	--	--	--	--
NOV												
16...	1400	1490	1870	7.9	15.5	50	9.1	94	2.7	180000	28000	36000
29...	1700	7910	--	--	25.0	--	--	--	--	--	--	--
DEC												
04...	1715	7820	--	--	25.5	--	--	--	--	--	--	--
14...	1145	6830	895	8.0	13.0	70	9.5	93	.8	2200	240	280
JAN												
11...	1140	6550	931	8.0	12.5	55	9.7	94	1.1	3200	180	1200
FEB												
15...	1130	4830	1080	7.9	15.0	35	9.6	98	1.2	1100	80	60
MAR												
15...	1145	1060	1180	8.2	22.0	15	9.6	113	3.1	5500	120	600
APR												
12...	1105	550	1200	7.9	23.5	15	8.0	96	4.2	19000	1200	260
17...	1715	4710	--	--	26.0	--	--	--	--	--	--	--
MAY												
10...	1210	6760	1020	7.6	26.0	90	7.8	98	1.4	100000	14000	4900
18...	1720	6190	--	--	26.0	--	--	--	--	--	--	--
JUN												
07...	1215	2060	1100	7.8	28.5	50	7.8	101	1.7	62000	28000	4800
JUL												
12...	1135	407	1720	7.4	30.0	8	6.2	83	5.1	960000	320000	14000
AUG												
16...	1215	505	1390	7.2	30.5	10	3.7	49	4.8	1100000	800000	24000
SEP												
13...	1145	586	1230	7.9	30.0	15	8.0	107	3.2	4600	630	860

08475000 RIO GRANDE AT BROWNSVILLE, TX---Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	HARD- NESS (CA+MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	SODIUM AD- SORP- TION RATIO	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO3) (MG/L)	CAR- BONATE (CO3) (MG/L)	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)
OCT 05...	--	--	--	--	--	--	--	--	--	--	--	--
19...	270	140	74	20	90	2.4	4.4	154	0	190	110	.3
29...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 16...	500	280	140	36	220	4.3	6.0	263	0	310	300	.2
29...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 04...	--	--	--	--	--	--	--	--	--	--	--	--
14...	250	160	71	18	90	2.5	3.8	108	0	180	100	.4
JAN 11...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 15...	300	170	84	22	110	2.8	4.3	162	0	210	140	.4
MAR 15...	350	200	97	26	120	2.8	4.8	188	0	230	160	.4
APR 12...	390	190	110	27	120	2.7	5.0	241	0	230	160	.4
17...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 10...	--	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 07...	280	160	78	21	120	3.1	4.3	150	0	210	140	.6
JUL 12...	450	230	120	36	200	4.1	5.9	260	0	300	250	.5
AUG 16...	390	210	110	29	150	3.3	5.9	230	0	260	190	.6
SEP 13...	260	150	74	19	160	4.3	4.8	140	0	220	190	.5

DATE	DIS- SOLVED SILICA (SiO2) (MG/L)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	TOTAL NITRATE (N) (MG/L)	TOTAL NITRITE (N) (MG/L)	TOTAL AMMONIA NITRO- GEN (N) (MG/L)	TOTAL ORGANIC NITRO- GEN (N) (MG/L)	TOTAL PHOS- PHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)	SUS- PENDE SEDIM- MENT (MG/L)	SUS- PENDE SEDIM- MENT DIS- CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT 05...	--	--	--	--	--	--	--	--	--	476	14400	97
19...	11	568	576	.08	.00	.07	.85	.16	--	260	1930	94
29...	--	--	--	--	--	--	--	--	--	550	3210	90
NOV 16...	17	1200	1160	.63	.02	.25	.67	.15	--	177	712	90
29...	--	--	--	--	--	--	--	--	--	1190	25400	88
DEC 04...	--	--	--	--	--	--	--	--	--	855	18100	93
14...	11	564	527	.37	.01	.06	.53	.12	--	260	4800	74
JAN 11...	--	--	--	.43	.01	.06	.53	.10	--	253	4470	60
FEB 15...	11	694	662	.62	.00	.04	.47	.09	2.4	166	2170	60
MAR 15...	14	782	745	.09	.01	.18	.77	.09	--	38	109	64
APR 12...	17	792	788	.11	.01	.17	.54	.12	5.8	41	61	95
17...	--	--	--	--	--	--	--	--	--	889	11300	97
MAY 10...	--	--	--	.42	.01	.03	.58	.17	--	503	9180	67
18...	--	--	--	--	--	--	--	--	--	1370	22900	76
JUN 07...	11	682	659	.18	.00	.06	.88	.11	5.0	277	1540	62
JUL 12...	19	1120	1060	.00	.01	.95	.25	.27	--	31	34	79
AUG 16...	18	884	877	.02	.02	.87	1.4	.45	--	21	29	87
SEP 13...	11	761	748	.08	.01	.15	.47	.12	--	40	63	94

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

[illegible]



## RIO GRANDE BASIN

08475000 RIO GRANDE AT BROWNSVILLE, TX.--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN- TANEOUS DIS- CHARGE (CFS)	TEMPER- ATURE (DEG C)	SUS- PENDE SEDIM- ENT (MG/L)	SUS- PENDE SEDIM- ENT DIS- CHARGE (T/DAY)	SUS. SED. FALL DIAM. % FINER THAN .002 MM	SUS. SED. FALL DIAM. % FINER THAN .004 MM	SUS. SED. FALL DIAM. % FINER THAN .008 MM
OCT								
05...	1830	11200	30.0	476	14400	49	63	76
19...	1110	2750	23.5	260	1930	--	--	--
29...	1830	2160	28.0	550	3210	61	71	84
NOV								
16...	1400	1490	15.5	177	712	--	--	--
29...	1700	7910	25.0	1190	25400	36	45	53
DEC								
04...	1715	7820	25.5	855	18100	46	52	59
14...	1145	6830	13.0	260	4800	--	--	--
JAN								
11...	1140	6550	12.5	253	4470	--	--	--
FEB								
15...	1130	4830	15.0	166	2170	--	--	--
MAR								
15...	1145	1060	22.0	38	109	--	--	--
APR								
12...	1105	550	23.5	41	61	--	--	--
17...	1715	4710	26.0	889	11300	41	60	68
MAY								
10...	1210	6760	26.0	503	9180	--	--	--
18...	1720	6190	26.0	1370	22900	19	23	24
JUN								
07...	1215	2060	28.5	277	1540	--	--	--
JUL								
12...	1135	407	30.0	31	34	--	--	--
AUG								
16...	1215	505	30.5	21	29	--	--	--
SEP								
13...	1145	586	30.0	40	63	--	--	--

DATE	SUS. SED. FALL DIAM. % FINER THAN .016 MM	SUS. SED. FALL DIAM. % FINER THAN .031 MM	SUS. SED. FALL DIAM. % FINER THAN .062 MM	SUS. SED. FALL DIAM. % FINER THAN .125 MM	SUS. SED. FALL DIAM. % FINER THAN .250 MM	SUS. SED. FALL DIAM. % FINER THAN .500 MM	SUS. SED. FALL DIAM. % FINER THAN 1.00 MM
OCT							
05...	83	91	97	99	99	100	--
19...	--	--	94	--	--	--	--
29...	87	89	90	94	98	99	100
NOV							
16...	--	--	90	--	--	--	--
29...	62	73	88	96	97	100	--
DEC							
04...	72	84	93	99	99	100	--
14...	--	--	74	--	--	--	--
JAN							
11...	--	--	60	--	--	--	--
FEB							
15...	--	--	60	--	--	--	--
MAR							
15...	--	--	64	--	--	--	--
APR							
12...	--	--	95	--	--	--	--
17...	81	91	97	99	100	--	--
MAY							
10...	--	--	67	--	--	--	--
18...	32	40	76	98	99	100	--
JUN							
07...	--	--	62	--	--	--	--
JUL							
12...	--	--	79	--	--	--	--
AUG							
16...	--	--	87	--	--	--	--
SEP							
13...	--	--	94	--	--	--	--

08475000 RIO GRANDE AT BROWNSVILLE, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	OCT 19.76 1110	NOV 16.76 1400	DEC 14.76 1145	JAN 11.77 1140	FEB 15.77 1130
TOTAL CELLS/ML	120000	35000	15000	15000	20000
DIVERSITY: DIVISION	0.3	1.3	0.5	1.1	1.5
..CLASS	0.3	1.3	0.5	1.1	1.5
..ORDER	0.6	1.5	1.4	1.6	2.2
...FAMILY	0.9	1.8	1.4	1.9	2.7
....GENUS	1.4	2.6	1.8	2.4	3.2

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....COELASTRACEAE										
.....COELASTRUM	--	-	--	-	--	-	120	1	--	-
...HYDRODICTYACEAE										
....PEDIASTRUM	--	-	--	-	--	-	--	-	--	-
...MICRACTINIACEAE										
....GOLENKINIA	--	-	--	-	--	-	--	-	--	-
...MICRACTINIUM	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE									820	4
....ANKISTRODESMUS	--	-	820	2	100	1	110	1	180	1
....CHODATELLA	--	-	--	-	--	-	--	-	*	0
...CLOSTERIOPSIS	--	-	--	-	--	-	--	-	--	-
...DICTYOSPHAERIUM	--	-	2000	6	--	-	--	-	360	2
....FRANCEIA	--	-	--	-	--	-	--	-	--	-
...KIRCHNERIELLA	--	-	--	-	--	-	5300#	36	--	-
...OOCYSTIS	--	-	--	-	140	1	--	-	--	-
...SELENASTRUM	--	-	--	-	--	-	--	-	2300	12
...TETRAEDRON	--	-	*	0	*	0	*	0	180	1
...WESTELLA	--	-	--	-	*	0	--	-	--	-
...SCENEDESMACEAE										
....CRUCIGENIA	--	-	1300	4	--	-	*	0	360	2
...SCENEDESMUS	3700	3	3300	10	380	3	460	3	2100	11
...TETRASTRUM	--	-	500	1	210	1	270	2	730	4
...TETRASPORALES										
...PALMELLACEAE										
...GLOEOCYSTIS	--	-	--	-	--	-	--	-	--	-
...ULOTRICHALES										
...ULOTRICHACEAE										
...HORMIDIUM	--	-	--	-	--	-	--	-	2200	11
...VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CARTERIA	--	-	--	-	*	0	*	0	--	-
...CHLAMYDOMONAS	--	-	*	0	--	-	81	1	*	0
...PHACOTACEAE										
...PHACOTUS	*	0	--	-	--	-	--	-	--	-
...ZYGNEATALES										
...DESMIDIACEAE										
...COSMARIMUM	--	-	--	-	--	-	*	0	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	--	-	190	1	*	0	*	0	180	1
...STEPHANODISCUS	--	-	--	-	--	-	--	-	--	-
..PENNALES										
...ACHNANTHACEAE										
....COCCONEIS	--	-	--	-	--	-	--	-	--	-
...CYMBELLACEAE										
....CYMBELLA	--	-	--	-	--	-	--	-	--	-
...DIATOMACEAE										
....DIATOMA	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE										
....FRAGILARIA	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	--	-	--	-	--	-	--	-	--	-
...NAVICULACEAE										
....CALONEIS	--	-	--	-	--	-	--	-	--	-
....DIPLONEIS	--	-	--	-	*	0	--	-	--	-
...NAVICULA	*	0	190	1	--	-	*	0	--	-
...NITZSCHIA										
...NITZSCHIAEAE										
....NITZSCHIA	740	1	3100	9	240	2	--	-	4900#	25
...SURTIRELLACEAE										
...CYMATOPLEURA	--	-	--	-	--	-	--	-	--	-
...SURTIRELLA	--	-	--	-	--	-	*	0	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## RIO GRANDE BASIN

08475000 RIO GRANDE AT BROWNSVILLE, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

(CONTINUED)

DATE TIME	OCT 19,76 1110		NOV 16,76 1400		DEC 14,76 1145		JAN 11,77 1140		FEB 15,77 1130	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCCOCCALES										
...CHROCCOCCAEAE										
....AGMENELLUM	7400	6	16000#	45	7600#	51	2300#	15	--	-
....ANACYSTIS	*	0	6300#	18	1000	7	4100#	28	1800	9
..HORMOGONALES										
...NOSTOCACEAE										
....ANABAENA	--	-	--	-	--	-	--	-	--	-
....APHANIZOMENON	--	-	--	-	--	-	1400	10	--	-
....CYLINDROSPERMUM	5500	5	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE										
....LYNGBYA	11000	9	--	-	--	-	--	-	--	-
...OSCILLATORIA	91000#	75	1100	3	5200#	34	--	-	3300#	17
...RIVULARIACEAE										
....RAPHIIDIOPSIS	*	0	*	0	--	-	--	-	--	-
...OSCILLATORIACEAE										
....PHORMIMIDIUM	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
...CRYPTOMONODACEAE										
....CRYPTOMONAS	--	-	--	-	--	-	--	-	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
...EUGLENACEAE										
....EUGLENA	--	-	*	0	--	-	--	-	--	-
....PHACUS	--	-	--	-	--	-	*	0	--	-
...TRACHELOMONAS	--	-	*	0	--	-	220	1	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

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08475000 RIO GRANDE AT BROWNSVILLE, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

DATE TIME	MAY 10.77 1210	JUN 7.77 1215	JUL 12.77 1135	AUG 16.77 1215	SEP 13.77 1145
TOTAL CELLS/ML	360	20000	510000	98000	220000
DIVERSITY: DIVISION	0.9	1.1	0.3	0.2	0.3
..CLASS	0.9	1.1	0.3	0.2	0.3
...ORDER	0.9	1.5	0.8	1.0	1.0
...FAMILY	1.8	1.8	1.0	1.5	1.0
....GENUS	1.8	2.6	2.2	1.9	1.9

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....COELASTRACEAE										
....COELASTRUM	200#	55	1300	7	4300	1	--	--	--	--
....HYDRODICTYACEAE										
....PEDIASTRUM	--	--	--	--	5600	1	--	--	--	--
....MICRACTINIACEAE										
....GOLFNKINIA	--	--	--	--	* 0	--	--	--	* 0	--
....MICRACTINIUM	--	--	--	--	--	--	--	--	--	--
....OOCYSTACEAE										
....ANKISTRODESMUS	--	--	170	1	4000	1	--	--	--	--
....CHODATELLA	--	--	--	--	--	--	--	--	--	--
....CLOSTERIOPSIS	--	--	* 0	--	--	--	--	--	--	--
....DICTYOSPHAERIUM	--	--	--	--	* 0	--	--	--	--	--
....FRANCEIA	--	--	* 0	--	--	--	--	--	--	--
....KIRCHNERIELLA	--	--	--	--	--	--	* 0	--	* 0	--
....OOCYSTIS	49	14	450	2	* 0	--	--	--	1300	1
....SELENASTRUM	--	--	--	--	--	--	--	--	--	--
....TETRAEDRON	--	--	* 0	--	--	--	* 0	--	--	--
....WESTELLA	--	--	--	--	--	--	--	--	--	--
....SCENEDESMACEAE										
....CRUCIGENIA	--	--	--	--	--	--	* 0	--	--	--
....SCENEDESMUS	* 0	--	1400	7	* 0	--	--	--	2600	1
....TETRASTRUM	--	--	550	3	--	--	--	--	--	--
..TETRASPORALES										
....PALMELLACEAE										
....GLOEOCYSTIS	--	--	170	1	--	--	--	--	--	--
..ULOTRICHALES										
....ULOTRICHACEAE										
....HORMIDIUM	--	--	--	--	--	--	--	--	--	--
..VOLVOCALES										
....CHLAMYDOMONADACEAE										
....CARTERIA	--	--	* 0	--	--	--	--	--	--	--
....CHLAMYDOMONAS	--	--	* 0	--	--	--	--	--	* 0	--
....PHACOTACEAE										
....PHACOTUS	--	--	--	--	--	--	--	--	--	--
..ZYGNEMATALES										
....DESMIDIACEAE										
....COSMARIUM	--	--	--	--	* 0	--	* 0	--	--	--
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
....COSCINODISCACEAE										
....CYCLOTELLA	--	--	380	2	--	--	--	--	* 0	--
....STEPHANODISCUS	--	--	--	--	--	--	--	--	* 0	--
..PENNALES										
....ACHNANTHACEAE										
....COCONEIS	12	3	--	--	--	--	--	--	--	--
....CYMBELLACEAE										
....CYMBELLA	25	7	--	--	--	--	--	--	--	--
....DIATOMACEAE										
....DIATOMA	* 0	--	--	--	--	--	--	--	--	--
....FRAGILARIACEAE										
....FRAGILARIA	--	--	140	1	--	--	--	--	--	--
....SYNEDRA	--	--	--	--	3800	1	1100	1	1300	1
....NAVICULACEAE										
....CALONEIS	--	--	* 0	--	--	--	--	--	--	--
....DIPLONEIS	* 0	--	--	--	--	--	--	--	--	--
....NAVICULA	* 0	--	--	--	2800	1	--	--	1200	1
....NITZSCHACEAE										
....NITZSCHIA	74#	21	580	3	--	--	* 0	--	--	--
....SURTIRELLACEAE										
....CYMATOPLEURA	* 0	--	--	--	--	--	--	--	--	--
....SURTIRELLA	* 0	--	--	--	--	--	--	--	--	--

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

08475000 RIO GRANDE AT BROWNSVILLE, TX.--Continued

## PHYTOPLANKTON ANALYSES, OCTOBER 1976 TO SEPTEMBER 1977

(CONTINUED)

DATE TIME	MAY 10.77 1210		JUN 7.77 1215		JUL 12.77 1135		AUG 16.77 1215		SEP 13.77 1145	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCALES										
...CHROCOCCACEAE										
....AGMENELLUM	--	-			5600	1	12000	13	12000	6
....ANACYSTIS	--	-	960	5	38000	7	14000	14	34000#	15
...HORMOGONALES										
...NOSTOCACEAE										
....ANARAFNA	--	-	--	-	*	0	--	-	--	-
....APHANIZOMENON	--	-	--	-	--	-	1600	2	--	-
...CYLINDROSPERMUM	--	-	--	-	--	-	11000	11	--	-
...OSCILLATORIACEAE										
....LYNGRYA	--	-	--	-	51000	10	--	-	52000#	24
....OSCILLATORIA	--	-	5000#	25	140000#	28	57000#	58	110000#	52
...RIVULARIACEAE										
...RAPHIDIOPSIS	--	-	--	-	6300	1	--	-	--	-
...OSCILLATORIACEAE										
...PHORMIDIUM	--	-	8500#	43	240000#	46	--	-	--	-
EUGLENOPHYTA (EUGLENIDS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES										
...CRYPTOMONADACEAE										
....CRYPTOMONAS	--	-	*	0	--	-	--	-	--	-
..EUGLENOPHYCEAE										
...EUGLENALES										
...EUGLENACEAE										
....EUGLENA	--	-	--	-	--	-	*	0	--	-
....PHACIUS	--	-	--	-	--	-	--	-	--	-
....TRACHELOMONAS	--	-	*	0	*	0	--	-	*	0

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

\* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

## MONTHLY AND ANNUAL MEANS AND LOADS FOR WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

MONTH	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1976.....	186250	946	590	295000	110	56300	190	94500	250
NOV. 1976.....	73092	1120	690	136000	150	28700	210	42200	300
DEC. 1976.....	215310	930	570	334000	110	64800	190	109000	250
JAN. 1977.....	166460	1040	640	289000	130	60100	200	90200	280
FEB. 1977.....	135260	991	610	224000	120	45000	190	71000	260
MAR. 1977.....	32728	1180	730	64500	160	14100	220	19600	310
APR. 1977.....	110710	996	620	184000	120	36100	200	59000	260
MAY 1977.....	171470	1070	660	307000	140	63900	210	95400	290
JUNE 1977.....	58974	1100	680	108000	140	22800	210	33800	290
JULY 1977.....	11650	1540	950	30000	230	7180	270	8630	410
AUG. 1977.....	5160	1310	810	11300	180	2550	240	3340	350
SEPT 1977.....	34088	1380	850	78500	200	18100	250	23100	370
TOTAL .....	1201152	**	**	2060000	**	420000	**	650000	**
WTD.AVG. ....	3290.83	1030	630	**	130	**	200	**	270

## 08475000 RIO GRANDE AT BROWNSVILLE, TX.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1030	1260	872	936	974	987	1220	1050	1070	1500	1350	1520
2	892	1220	876	1190	974	1050	1260	1030	1070	1480	1250	1450
3	892	1350	876	961	974	991	1260	1040	1070	1500	1230	1450
4	888	1330	873	961	970	1160	1270	1040	1070	1510	1310	1450
5	898	1500	922	965	970	1160	1170	1020	1070	1530	1340	1450
6	894	1460	900	965	970	1200	1260	1030	1070	1460	1280	1440
7	904	1500	922	965	970	1240	1140	1050	1080	1430	1300	1450
8	897	1530	926	961	970	1280	1170	1060	1100	1430	1320	1410
9	897	1500	922	960	970	1330	1010	1050	1130	1450	1250	1460
10	897	1440	1420	965	980	1360	1030	1080	1100	1500	1270	1290
11	897	1490	900	965	990	1420	1060	1100	982	1520	1190	1290
12	900	1500	911	1120	1020	1290	1110	1110	982	1560	1160	1290
13	939	1520	915	1110	1060	1230	1140	1090	982	1820	1160	1280
14	935	1540	918	1120	1070	1170	856	1110	990	1560	1200	1280
15	903	1560	914	1120	1100	1190	926	1100	991	1850	1280	1290
16	899	1580	924	1120	1040	1260	896	1100	1000	1870	1270	1280
17	1100	1520	928	1120	1010	1220	889	1100	991	1870	1250	1280
18	1100	1570	961	1120	991	1320	875	1090	1220	1880	1220	1270
19	1070	1550	1010	1120	978	1230	878	1040	1220	1810	1380	1260
20	1210	1540	1010	1130	1010	1230	1000	1050	1220	1770	1270	1260
21	1210	908	921	1120	1000	1230	1050	1120	1220	1620	1250	1290
22	1220	897	913	1130	982	1250	1030	1120	1220	1690	1230	1290
23	1210	890	884	1000	982	1280	1000	1110	1220	1740	1270	1320
24	906	900	913	970	974	1320	1000	1110	1220	1500	1330	1310
25	906	900	910	1010	974	1320	1000	1120	1210	1360	1330	1320
26	1190	1310	920	1000	903	1210	1000	1120	1260	1380	1260	1330
27	1190	922	915	1160	950	1210	1040	1110	1340	1650	1250	1310
28	1080	922	910	1160	996	1200	1000	1100	1370	1630	1260	1360
29	1140	880	900	974	---	1210	1000	1090	1480	1280	1270	1510
30	1170	876	890	970	---	1240	1000	1080	1340	1280	1280	1550
31	1200	---	920	970	---	1210	---	1070	---	1300	1400	---
MEAN	1010	1300	932	1040	991	1230	1050	1080	1140	1570	1270	1360

## SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	2410	1000	6510	1680	240	1090	9040	680	16600
2	5060	780	10700	1570	300	1270	9050	590	14400
3	8920	510	12300	1320	140	499	8630	500	11700
4	10800	465	13600	1090	37	109	7940	640	13700
5	11200	470	14200	949	36	92	7270	430	8440
6	11000	690	20500	885	40	96	6590	290	5160
7	10900	755	22200	971	50	131	5920	210	3360
8	10900	690	20300	1010	51	139	5560	220	3300
9	10900	500	14700	1040	36	101	5870	320	5070
10	10800	580	16900	1020	36	99	6190	350	5850
11	10800	480	14000	864	38	89	6370	190	3270
12	10800	710	20700	854	45	104	6580	180	3200
13	10600	570	16300	856	50	116	6760	170	3100
14	10100	350	9540	953	100	257	6820	190	3500
15	8850	912	21600	1150	180	559	6760	180	3290
16	7100	512	10300	1460	210	828	6740	270	4910
17	4930	490	6520	1550	190	795	7090	280	5360
18	3620	450	4400	1590	160	687	7620	400	8230
19	2700	310	2260	1760	160	760	7870	120	2550
20	2260	350	2140	1980	190	1020	7980	130	2800
21	2260	180	1100	2220	575	3450	7990	130	2800
22	2050	160	886	2720	820	6020	7770	160	3360
23	1840	190	944	3310	650	5810	7460	210	4230
24	1620	405	1770	3700	640	6390	6450	160	2790
25	1720	550	2550	4070	610	6700	5180	180	2520
26	1900	290	1490	4650	400	5020	5140	220	3050
27	1970	220	1170	5390	720	10500	5970	240	3870
28	2450	340	2250	6310	800	13600	6680	230	4150
29	2240	530	3210	7650	870	18000	6900	210	3910
30	1950	500	2630	8520	700	16100	6780	180	3300
31	1600	355	1530	---	---	---	6340	---	---
TOTAL	186250	---	279200	73092	---	100431	215310	---	161770



## SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JANUARY			FEBRUARY			MARCH			
1	5920	140	2240	4940	160	2130	3520	160	1520
2	5690	240	3690	4740	170	2180	2990	180	1450
3	5640	210	3200	4850	160	2100	2380	190	1220
4	5700	140	2150	5270	160	2280	1800	120	583
5	6010	140	2270	5620	160	2430	1460	80	315
6	6350	210	3600	5760	160	2490	1260	50	170
7	6460	200	3490	5790	150	2340	1090	39	115
8	6540	160	2830	5710	160	2470	1190	28	90
9	6770	180	3290	5530	180	2690	1190	35	112
10	6870	180	3340	5030	160	2170	1040	29	81
11	6450	275	4790	4550	140	1720	955	30	77
12	5620	210	3190	4290	120	1390	1000	27	73
13	4870	130	1710	4350	110	1290	1110	30	90
14	4480	130	1570	4570	90	1110	1130	32	98
15	4360	140	1650	4870	100	1310	1030	26	72
16	4470	160	1930	5140	110	1530	693	26	49
17	4950	140	1870	5060	120	1640	519	74	104
18	5400	140	2040	4900	120	1590	496	33	44
19	5830	150	2360	4980	120	1610	470	33	42
20	5880	140	2220	5010	130	1760	449	30	36
21	5740	150	2320	5000	160	2160	686	27	50
22	5530	140	2090	4850	100	1310	850	32	73
23	5110	120	1660	4530	170	2080	624	28	47
24	4440	90	1080	4300	160	1860	460	28	35
25	3640	65	639	3980	170	1830	408	28	31
26	3130	80	676	3910	210	2220	522	36	51
27	3890	140	1470	3940	220	2340	589	35	56
28	4780	180	2320	3790	190	1940	823	33	73
29	5370	160	2320	---	---	---	764	30	62
30	5400	145	2110	---	---	---	682	35	64
31	5170	150	2090	---	---	---	548	50	74
TOTAL	166460	---	72205	135260	---	53970	32728	---	6957
DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
APRIL			MAY			JUNE			
1	517	48	67	7490	586	11800	5050	200	2730
2	566	28	43	7650	1240	25600	4210	190	2160
3	659	30	53	7640	880	18200	3530	200	1910
4	1130	30	92	7320	460	9090	2850	190	1460
5	912	74	182	7000	1230	23400	2130	180	1040
6	429	32	37	6780	290	5310	1850	170	849
7	191	46	24	6650	340	6100	2060	220	1220
8	167	64	29	7170	250	4840	2410	190	1240
9	229	350	216	6790	240	4400	2770	170	1270
10	299	620	501	6620	430	7690	2680	200	1450
11	448	610	738	6260	520	8790	2570	620	4300
12	533	210	302	5980	320	5170	2780	800	6000
13	511	80	110	5870	450	7130	3500	500	4720
14	949	432	1140	5940	500	8020	3590	430	4170
15	2130	628	3440	6180	320	5340	2620	480	3400
16	3540	947	8680	6540	340	6000	1340	520	1880
17	4590	840	10400	6540	570	10100	720	500	972
18	5450	900	13200	6070	1370	22500	740	160	320
19	5880	780	12400	5350	310	4480	777	38	80
20	6450	572	9860	4460	400	4820	732	36	71
21	7130	863	16400	3740	200	2020	543	34	50
22	7420	660	13200	3320	180	1610	517	32	45
23	7530	630	12800	3090	160	1330	936	34	86
24	7700	480	9980	2980	160	1290	1110	31	93
25	7860	540	11500	2600	200	1400	1220	33	109
26	7860	360	7640	3150	220	1870	1340	50	181
27	7720	770	16000	4160	210	2360	1360	94	345
28	7430	710	14200	4070	200	2200	1200	30	97
29	7240	1050	20500	3950	210	2240	968	35	91
30	7240	1250	24400	4690	220	2790	871	36	85
31	---	---	---	5420	200	2930	---	---	---
TOTAL	110710	---	208134	171470	---	220820	58974	---	42424

## RIO GRANDE BASIN

545

08475000 RIO GRANDE AT BROWNSVILLE, TX.--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JULY			AUGUST			SEPTEMBER			
1	784	24	51	151	12	4.9	2120	680	3890
2	652	56	99	204	12	6.6	2060	670	3730
3	754	60	122	151	10	4.1	2280	610	3760
4	1040	70	197	68	14	2.6	2500	620	4180
5	1240	91	305	48	10	1.3	2970	780	6250
6	1190	53	170	53	6	0.86	2920	730	5760
7	680	58	106	58	10	1.6	1900	630	3230
8	392	46	49	92	6	1.5	1080	710	2070
9	335	63	57	129	10	3.5	640	750	1300
10	383	70	72	206	22	12	461	500	622
11	360	250	243	170	22	10	454	400	490
12	316	170	145	94	8	2.0	554	200	299
13	141	69	26	90	9	2.2	623	250	421
14	183	92	45	143	10	3.9	569	270	415
15	199	102	55	230	8	5.0	536	300	434
16	187	200	101	176	4	1.9	1250	400	1350
17	230	150	93	105	5	1.4	2540	650	4460
18	259	34	24	78	4	0.84	2480	500	3350
19	316	37	32	75	5	1.0	1690	200	913
20	299	44	36	111	5	1.5	1130	100	305
21	163	10	4.4	141	7	2.7	854	50	115
22	110	16	4.8	104	8	2.2	524	30	42
23	85	12	2.8	63	8	1.4	324	45	39
24	95	19	4.9	68	4	0.73	269	32	23
25	160	37	16	47	5	0.63	310	36	30
26	398	49	53	30	7	0.57	326	35	31
27	291	14	11	61	4	0.66	268	60	43
28	145	13	5.1	129	10	3.5	175	33	16
29	90	8	1.9	190	50	26	150	60	24
30	75	10	2.0	275	408	309	131	57	20
31	98	12	3.2	1620	780	3410	---	---	---
TOTAL	11650	---	2137.1	5160	---	3826.09	34088	---	47612
YEAR	1201152		1199486						



A low-flow investigation along a watercourse involves making discharge measurements at selected sites in a given reach of a channel. In addition, discharge measurements of inflow and diversions, field commentary relative to observations, water samples and temperature, and other relevant data are collected. Measuring sites are described to the extent that they may be used in subsequent investigations. At times, temporary recording installations are used to supplement records at regular gaging stations in the study of flow trends.

In tabulating the results, the indicated gains or losses may appear incompatible because of diurnal or other flow variations, or because of small inaccuracies in open-channel measurements. These trends in a reach may vary with the seasons, because of regulation, or other factors. Successive investigations may serve to delineate a progressive change in flow trends.

## COLORADO RIVER BASIN

## Colorado River Low-Flow Investigations

PURPOSE.--To determine the changes in quantity and quality of low flow in this reach of the Colorado River.

REACH.--The investigations began on the Colorado River at a point 100 ft above the mouth of Bull Creek and ended at the stream-gaging station, Colorado River at Colorado City. The investigations involved a distance along the Colorado River of 35.5 mi.

PREVIOUS INVESTIGATIONS.--1968, 1975, 1976.

SUMMARY.--Two low-flow investigations were made on Jan. 28, 1977, and Mar. 14, 1977. During these investigations, climatic factors were favorable for determining the gains and losses. There was no storm runoff, no known diversions from the river, and no appreciable loss could be attributed to evapotranspiration.

Location and description of data-collection sites, Colorado River and tributaries

Site No.	Stream	Location	Date	River mile	Water temp. (°C)	Discharge (ft <sup>3</sup> /s)		Remarks
						Main stream	tributary	
1	Colorado River	Lat 32°34'58", long 101°05'42", 50 ft upstream from Bull Creek.	Jan. 28 Mar. 14	831.8	4.5 11.0	0.03 .02	-	Streambed of sand. Grass and scattered trees on banks.
2	Bull Creek	Lat 32°36'00", long 101°05'38", 300 ft upstream from bridge on Farm Road 2085.	Jan. 28 Mar. 14	-	5.5 11.0	-	0.16 .05	Streambed of gravel and sand. Grass and scattered trees on banks.
2A	....do.....	Lat 32°34'54", long 101°05'42", 30 ft upstream from Colorado River.	Jan. 28 Mar. 14	-	5.0 11.0	-	.11 .05	Do
4	Colorado River	Lat 32°34'17", long 101°03'20", 40 ft upstream from Bluff Creek.	Jan. 28 Mar. 14	828.8	4.5 15.0	.30 .06	-	Streambed of gravel and sand. Grass, brush, and scattered trees on banks.
5	Bluff Creek	Lat 32°35'29", long 101°03'02", at bridge on Farm Road 1606.	Jan. 28 Mar. 14	-	5.0 11.0	-	.28 .20	Streambed of gravel and sand. Grass and scattered trees on banks.
6	....do.....	Lat 32°34'20", long 101°03'21", 150 ft upstream from mouth.	Jan. 28 Mar. 14	-	6.0 15.0	-	.23 .11	Streambed of coarse sand over sandstone. Grass and thin brush on banks.
7	Colorado River	Lat 32°32'18", long 101°03'12", at stream-gaging station.	Jan. 28 Mar. 14	826.3	7.0 22.0	1.49 .55	-	Wide, flat sand channel with steep banks. Thick stand of salt cedars along banks.
8	....do.....	Lat 32°30'43", long 101°01'42", 30 ft upstream from Willow Creek.	Jan. 28 Mar. 14	824.0	7.0 13.0	1.25 .12	-	Streambed of sand and silt. Steep banks with heavy stand of salt cedars along left bank.
9	Willow Creek	Lat 32°30'42", long 101°01'46", 300 ft upstream from mouth.	Jan. 28 Mar. 14	-	-	-	0 0	Streambed of sand. Steep grassy banks with heavy stand of brush.
10	Colorado River	Lat 32°32'25", long 100°56'54", 15 ft upstream from Canyon Creek.	Jan. 28 Mar. 14	817.8	6.0 9.0 6.0 13.5	1.28 .83 .60 .61	-	Streambed of sand. Steep banks with thick stand of salt cedars.
11	Canyon Creek	Lat 32°32'26", long 100°56'53", 15 ft upstream from mouth.	Jan. 28 Mar. 14	-	5.5 13.5	-	.98 .68	Streambed of gravel and sand. Steep banks with heavy stand of brush and trees.
12	Colorado River	Lat 32°30'51", long 100°54'46", 300 ft upstream from Deep Creek.	Jan. 28 Mar. 14	814.3	5.0 16.5	2.79 1.63	-	Wide sand channel. Thick stand of salt cedars along banks.
13	Deep Creek	Lat 32°32'25", long 100°54'27", at stream-gaging station* 08120500.	Jan. 28 Mar. 14	-	6.0 14.0	-	2.19 1.95	Streambed of gravel. Steep grassy banks lined with scattered large trees.
14	....do.....	Lat 32°30'51", long 100°54'43", 70 ft upstream from mouth.	Jan. 28 Mar. 14	-	5.0 13.0	-	4.84 4.77	Streambed of sand. Steep grassy banks with heavy stand of salt cedars.
15	Colorado River	Lat 32°28'41", long 100°56'54", at stream-gaging station 08120700.	Jan. 28 Mar. 14	810.6	7.0 13.0	8.72 5.26	-	Wide streambed of gravel and sand. Steep banks with heavy stand of salt cedars.

Location and description of data-collection sites, Colorado River and tributaries--Continued								
Site No.	Stream	Location	Date	River mile	Water temp. (°C)	Discharge (ft <sup>3</sup> /s)		Remarks
						Main stream	tributary	
16	Colorado River	Lat 32°26'35", long 100°56'45", 1,000 ft downstream from Cedar Bend bridge.	Jan. 28 Mar. 14	804.4	6.5 15.5	8.57 5.84	- -	Streambed of gravel. Steep banks with heavy stand of salt cedars.
17	....do.....	Lat 32°25'51", long 100°55'00", 30 ft upstream from low-water crossing 1 mi northwest of Colorado River Municipal Water District diversion station.	Jan. 28 Mar. 14	802.1	6.5 20.0	7.86 6.47	- -	Streambed of gravel. Steep banks with scattered salt cedars.
18	Bone Hollow	Lat 32°25'33", long 100°53'43", at right of private dam and 300 ft upstream from mouth.	Jan. 28 Mar. 14	-	8.0 23.0	- -	0.04 .04	Streambed of sandstone and shale. Scattered trees and brush.
19	CRMWD Diversion	Lat 32°25'08", long 100°54'21", at Colorado River Municipal Water District pump station.	Jan. 28 Mar. 14	799.3	8.0 17.0	- -	- -	Entire flow of river since Jan. 24 was being pumped into Colorado River Municipal Water District off-channel reservoir. No pumping for three weeks prior to Jan. 24.
20	Colorado River	Lat 32°24'51", long 100°54'28", 1,500 ft downstream from Colorado River Municipal Water District diversion dam.	Jan. 28 Mar. 14	798.9	11.0 26.0	.12 .07	- -	Wide streambed of gravel over sandstone. Heavy stand of salt cedars along fairly steep banks.
21	....do.....	Lat 32°23'33", long 100°52'42", at stream-gaging station	Jan. 28 Mar. 14	796.3	4.0 13.5	.21 .34	- -	Streambed of gravel with heavy stand of salt cedars.

## STREAMFLOW AND WATER-QUALITY DATA FOR THE COLORADO RIVER AND TRIBUTARIES, JAN. 28, 1977

SITE	STREAM	DISCHARGE (FT <sup>3</sup> /S)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAGNE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED POTAS- SIUM (P) (MG/L)	a/ BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	DIS- SOLVED SUL- FATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	PH (UNITS)
1	Colorado River	0.03	2.4	390	150	2400	8.5	284	1100	3800	7990	1600	1400	12300	7.8
2	Bull Creek	.16	1.8	350	120	1400	7.2	276	560	2600	5180	1400	1100	8600	7.7
2A	.....do.....	.11	2.4	390	140	2400	8.5	292	1100	3700	7880	1600	1300	12200	7.8
4	Colorado River	.30	.1	360	150	2900	9.4	220	1300	4600	9430	1500	1300	14500	7.9
5	Bluff Creek	.28	8.9	250	74	270	4.7	324	730	380	1880	930	660	2740	8.1
6	.....do.....	.23	5.3	250	84	400	5.5	288	760	600	2250	970	730	3400	7.9
7	Colorado River	1.5	1.5	360	150	3200	10	228	1300	4700	9830	1500	1300	15100	7.8
8	.....do.....	1.2	1.2	340	150	2800	8.8	256	1400	4100	8930	1500	1300	13500	7.9
10	.....do.....	1.3	1.1	380	160	3100	9.9	260	1500	4700	9980	1600	1400	15000	7.9
11	Canyon Creek	.98	4.2	230	150	560	3.9	428	1300	510	2960	1200	800	4040	8.0
12	Colorado River	2.8	2.2	340	160	2200	7.8	336	1400	3200	7480	1500	1200	11000	7.9
14	Deep Creek	4.8	6.9	180	99	380	8.2	380	910	340	2110	860	550	3030	7.8
15	Colorado River	8.7	2.2	250	120	1000	8.2	360	1000	1400	3960	1100	820	6210	8.1
16	.....do.....	8.6	.6	260	130	1100	8.0	346	1000	1500	4170	1200	900	6480	8.2
17	.....do.....	7.9	.6	280	130	1400	8.7	346	1100	1900	4990	1200	950	7610	8.1
18	Bone Hollow	.04	.4	270	160	400	10	268	1300	460	2730	1300	1100	3740	7.9
19	CMMWD diversion	-	3.7	280	120	1400	7.8	308	1000	2000	4960	1200	940	7820	7.8
20	Colorado River	.12	.3	330	160	3200	12	120	1400	4700	9860	1500	1400	15000	7.7
21	.....do.....	.21	1.2	300	180	1400	8.5	324	1500	2000	5550	1500	1200	8240	7.8

a/ Includes the equivalent of any carbonate (CO<sub>3</sub>) present.



## STREAMFLOW AND WATER-QUALITY DATA FOR THE COLORADO RIVER AND TRIBUTARIES, MAR. 14, 1977

SITE	STREAM	DISCHARGE (FT <sup>3</sup> /S)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAGNE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED POTAS- SIUM (P) (MG/L)	a/ BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	DIS- SOLVED SUL- FATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L)	HARD- NESS (CA,MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	PH (UNITS)
1	Colorado River	0.02	0.6	380	200	4200	14	310	2100	6100	13100	1800	1500	20400	7.7
2	Bull Creek	.05	.5	350	150	1100	7.4	240	710	2100	4530	1500	1300	7360	7.8
2A	.....do.....	.05	1.7	400	180	2400	14	220	1500	4000	8600	1700	1600	13500	7.8
4	Colorado River	.06	.3	380	220	4000	17	150	1900	6200	12800	1900	1700	20100	7.8
5	Bluff Creek	.20	3.5	230	98	340	5.0	250	770	530	2100	980	770	3160	8.0
6	.....do.....	.11	1.0	240	110	550	6.4	230	900	740	2660	1100	860	4000	7.9
7	Colorado River	.55	2.5	250	180	3800	22	190	1500	5900	11800	1600	1500	18800	7.9
8	.....do.....	.12	.5	420	190	3300	15	230	1700	5000	10900	1800	1600	16600	7.8
10	.....do.....	.61	.8	200	220	3600	18	210	1800	5500	12000	2000	1900	18100	7.9
11	Canyon Creek	.68	2.2	360	150	550	4.2	380	1200	450	2750	1100	800	3870	8.1
12	Colorado River	1.6	.9	120	190	2100	12	280	1500	3200	7700	1700	1500	11900	7.9
13	Deep Creek	1.9	18	190	30	210	13	380	250	230	1060	420	110	1720	7.9
14	.....do.....	4.8	6.3	260	98	340	11	370	840	330	2000	880	580	2920	8.2
15	Colorado River	5.3	1.3	260	130	950	15	350	1000	1300	3830	1200	900	6010	8.3
16	.....do.....	5.8	.4	280	150	1100	12	290	1100	1600	4370	1300	1000	6860	7.7
17	.....do.....	6.5	.4	330	160	1200	12	270	1200	1700	4690	1400	1100	7240	7.7
18	Bone Hollow	.04	.4	290	200	500	16	270	1500	520	3200	1600	1400	4200	7.7
19	CRMWD diversion	-	1.8	1000	140	1500	11	230	1100	2200	5360	1300	1100	8560	7.8
20	Colorado River	.07	3.7	330	410	15000	46	82	3600	23000	43100	4200	4100	61100	6.7
21	.....do.....	.34	1.1		210	1800	13	280	1800	2500	6790	1700	1500	10100	7.6

a/ Includes the equivalent of any carbonate (CO<sub>3</sub>) present.

A low-flow investigation along a watercourse involves making discharge measurements at selected sites in a given reach of a channel. In addition, discharge measurements of inflow and diversions, field commentary relative to observations, water samples and temperature, and other relevant data are collected. Measuring sites are described to the extent that they may be used in subsequent investigations. At times, temporary recording installations are used to supplement records at regular gaging stations in the study of flow trends.

In tabulating the results, the indicated gains or losses may appear incompatible because of diurnal or other flow variations, or because of small inaccuracies in open-channel measurements. These trends in a reach may vary with the seasons, because of regulation, or other factors. Successive investigations may serve to delineate a progressive change in flow trends.

## GUADALUPE RIVER BASIN

## Blanco River Low-Flow Investigation

PURPOSE.--To determine the changes in quantity and quality of low flow in this reach of the Blanco River.

REACH.--The investigation began on the Blanco River at East Chimney Road crossing, 5.6 mi east of Blanco, and ended at Pleasant Valley crossing, 6.1 mi west of Wimberley. The investigation involved a distance along the Blanco River of 17.13 mi.

PREVIOUS INVESTIGATIONS.--1955, 1963.

SUMMARY.--One low-flow investigation was made on July 18, 1977. During the investigation there was no storm runoff, no known diversion from the river, and no appreciable loss could be attributed to evapotranspiration.

Site No.	Stream	Location	Date	River mile	Water temp. (°C)	Discharge (ft <sup>3</sup> /s)		Remarks
						Main stream	Tributary	
1	Blanco River	Lat 30°05'17", long 98°19'29", at East Chimney Road (county road) and 5.6 mi east of Blanco.	July 18	58.08	29.5	16.5	-	Water-quality samples collected.
2	..do...	Lat 30°02'48", long 98°15'33", at Buchanan Ranch crossing and 10.1 mi northwest of Wimberley.	July 18	52.14	30.0	.8	-	Conductance recorded.
3	Little Blanco River	Lat 30°02'26", long 98°15'09", at Buchanan Ranch crossing and 9.9 mi northwest of Wimberley.	July 18	-	-	-	0	
4	Blanco River	Lat 30°03'02", long 98°14'05", 20 ft downstream from mouth of Little Blanco River and 9.7 mi northwest of Wimberley.	July 18	47.70	-	0	-	
5	..do...	Lat 30°02'53", long 98°14'15", 1,000 ft upstream from mouth of Wanslow Creek and 9.3 mi northwest of Wimberley.	July 18	46.78	-	0	-	
6	..do...	Lat 30°03'02", long 98°14'06", 100 ft upstream from mouth of Wanslow Creek and 9.1 mi northwest of Wimberley.	July 18	46.58	-	0	-	
7	..do...	Lat 30°03'03", long 98°14'03", at mouth of Wanslow Creek and 9.1 mi northeast of Wimberley.	July 18	46.55	22.5	2.6	-	Water-quality samples collected.
8	..do...	Lat 30°02'05", long 98°13'19", at Burnett Acres and 8.1 mi west of Wimberley.	July 18	45.02	32.0	.2	-	Flow estimated. Conductance recorded.
9	..do...	Lat 30°02'05", long 98°13'19", at bridge in Burnett Acres and 8.0 mi west of Wimberley.	July 18	44.89	32.0	.1	-	
10	..do...	Lat 30°01'47", long 98°13'15", 100 ft upstream from spring in Burnett Acres and 7.9 mi west of Wimberley.	July 18	44.75	-	0	-	
11	..do...	Lat 30°01'55", long 98°13'13", 100 ft downstream from spring in Burnett Acres and 7.9 mi west of Wimberley.	July 18	44.71	24.0	7.1	-	Conductance recorded.
12	..do...	Lat 30°00'57", long 98°12'52", below Burnett Acres ranchhouse and 7.3 mi west of Wimberley.	July 18	42.67	25.5	44.4	-	Water-quality samples collected.
13	..do...	Lat 30°00'01", long 98°11'59", at Pleasant Valley crossing and 6.1 mi west of Wimberley.	July 18	40.95	24.5	68.2	-	Do

## BLANCO RIVER LOW-FLOW INVESTIGATION--Continued

STREAMFLOW AND WATER-QUALITY DATA FOR THE BLANCO RIVER AND TRIBUTARIES, JULY 18, 1977

SITE	STREAM	DISCHARGE (FT <sup>3</sup> /S)	DIS- SOLVED SILICA (SiO <sub>2</sub> ) (MG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAGNE- SIUM (MG) (MG/L)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED POTAS- SIUM (P) (MG/L)	a/ BICAR- BONATE (HCO <sub>3</sub> ) (MG/L)	DIS- SOLVED SUL- FATE (SO <sub>4</sub> ) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)	DIS- SOLVED FLUO- RIDE (F) (MG/L)	DIS- SOLVED SOLIDS (SUM OF CONSTITU- ENTS) (MG/L)	HARD- NESS (CA, MG) (MG/L)	NON- CAR- BONATE HARD- NESS (MG/L)	SPECIFIC CONDUCT- ANCE (MICRO- MHOS)	PH (UNITS)
1	Blanco River	16	12	49	19	12	1.3	220	23	18	0.2	243	200	20	442	8.0
2	.....do.....	-	-	-	-	-	-	-	-	-	-	-	-	-	438	-
7	.....do.....	2.6	9.3	73	15	6.9	1.0	290	20	11	.2	279	240	6	533	7.5
8	.....do.....	-	-	-	-	-	-	-	-	-	-	-	-	-	354	-
11	.....do.....	-	-	-	-	-	-	-	-	-	-	-	-	-	507	-
12	.....do.....	44	11	75	16	8.9	1.2	290	25	14	.2	294	250	15	525	7.7
13	.....do.....	68	11	76	16	8.7	1.2	280	27	21	.2	299	260	26	518	7.6

Because the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than continuous stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage of those events. The data collected for special reasons are called measurements at miscellaneous sites.

Streamflow data collected at partial-record stations where water-quality data other than observations of water temperature are not obtained are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations; the second is a table of annual maximum stage and (or) discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low and high flows are given in a third table. Discharge measurements and water-quality data collected at partial-record stations are presented in downstream order in the section of this report entitled "Gaging-station records."

#### Low-flow partial-record stations

Measurements of streamflow at low-flow partial-record stations that are not published in the gaging-station section are given in the following table. Most of the measurements of low flow were made during periods when streamflow was sustained primarily by ground-water discharge. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will indicate the low-flow potential of the stream. The years listed in the column headed "Period of record" identifies the water years in which measurements were made at the same or at practically the same site.

Discharge measurements made at low-flow partial-record stations during water year 1977

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
Colorado River basin						
08118600	Colorado River below Bull Creek near Ira, Tex.	Lat 32°34'54", long 101°05'42", Scurry County, just downstream from Bull Creek, 5.1 mi downstream from Colorado River Dam (Lake J. B. Thomas), 5.5 mi west of Ira, and at mile 831.8.	-	1975-76	7-28-77	0
08129500	Dove Creek Spring near Knickerbocker, Tex.	Lat 31°11'06", long 100°43'51", Irion County, at headquarters ranchhouse, 500 ft upstream from Dove Creek, 1.8 mi upstream from Stilson Dam on Dove Creek, and 8.5 mi southwest of Knickerbocker.	(c)	1944-58*, 1959-77	10-21-76 12- 1-76 1-14-77 2-23-77 4- 5-77 5-17-77 6-23-77 8-10-77 9-20-77	26 24 30 22 21 45 35 34 28
08131300	South Concho River above Pecan Creek near San Angelo, Tex.	Lat 31°20'13", long 100°28'46", Tom Green County, 1,000 ft upstream from Pecan Creek and about 9 mi south of San Angelo.	(c)	1963-77	10-18-76 12- 3-76 1-13-77 2-25-77 4- 4-77 5-16-77 6-29-77 8- 8-77 9-19-77	8.8 10 10 10 8.9 10 7.8 6.0 5.4
08143900	Springs at Fort McKavett, Tex.	Lat 30°50'03", long 100°05'37", Menard County, at Fort McKavett.	(c)	1902, 1905, 1922, 1942, 1948-49, 1951-52, 1955-56, 1958-77	1-20-77 7- 8-77	31 43
08146500	San Saba Springs at San Saba, Tex.	Lat 31°11'44", long 98°42'42", San Saba County, 150 ft upstream from bridge on U.S. Highway 190 at San Saba and 0.8 mi east of courthouse.	(c)	1939, 1952, 1957, 1959-77	1-18-77 8- 9-77	10 8.5
08149400	South Llano River near Telegraph, Tex.	Lat 30°15'43", long 99°56'01", Edwards County, 3.7 mi upstream from Paint Creek, 5.7 mi south of Telegraph, and 18.7 mi southwest of Junction.	(c)	1939, 1952, 1956, 1959-77	1-19-77 7- 8-77	36 33
08149500	Seven Hundred Springs near Telegraph, Tex.	Lat 30°16'12", long 99°55'22", Edwards County, about 3 mi upstream from Paint Creek, about 5 mi south of Telegraph, and about 18 mi southwest of Junction.	(c)	1939, 1952, 1955-56, 1959-77	1-19-77 7- 8-77	24 22
08155400	Barton Creek above Barton Springs at Austin, Tex.	Lat 30°15'48", long 97°46'19", Travis County, just upstream from upper dam of Barton Creek swimming pool in Zilker Park and upstream from all springs known as Barton Springs at Austin.	125	1919-77	11- 3-76 3- 2-77 5-18-77 9-22-77	.50 49 39 0
08155500	Barton Springs at Austin, Tex.	Lat 30°15'49", long 97°46'02", Travis County, in Zilker Park just below the lowest dam at Austin.	(c)	1895-1916, 1917-18*, 1919-77	11- 3-76 3- 2-77 5-18-77 9-22-77	96 99 105 79
Guadalupe River basin						
08166150	Guadalupe River above Kerrville, Tex.	Lat 30°03'55", long 99°11'02", Kerr County, 0.6 mi downstream from Bear Creek and 3.0 mi northwest of Kerrville.	-	1976-77	8-18-76f 9-29-76 11-11-76 12-21-76 2- 4-77 3-15-77 5- 4-77 6- 6-77 7-18-77 8-31-77	74 81 81 83 82 73 231 152 93 66

\* Operated as a continuous-record station.

f Not previously published.

c Not applicable

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at low-flow partial-record stations during water year 1977--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
Guadalupe River basin--Continued						
08168000	Hueco Springs near New Braunfels, Tex.	Lat 29°45'31", long 98°08'34", Comal County, two springs located 200 and 400 ft west of the Guadalupe River, 0.3 mi upstream from mouth of Elm Creek, and 4.2 mi north of New Braunfels.	(c)	1944-77	10-12-76 11-24-76 1- 4-77 2-14-77 3-28-77 5- 9-77 6-20-77 8- 4-77 9-12-77	35 88 88 92 87 85 84 76 61
08168600	Blieders Creek at New Braunfels, Tex.	Lat 29°43'14", long 98°07'23", Comal County, at Grove Avenue crossing in northwest New Braunfels and 0.25 mi upstream from mouth.	-	1962-77	1- 3-77 6-20-77	0 0
08168700	Panther Canyon at New Braunfels, Tex.	Lat 29°42'47", long 98°08'14", Comal County, at Landa Park Drive crossing in Landa Park at New Braunfels.	-	1962-77	1- 3-77 6-20-77	0 0
08168800	Dry Comal Creek at New Braunfels, Tex.	Lat 29°41'52", long 98°08'11", Comal County, at Floral Avenue crossing in New Braunfels, 0.6 mi upstream from Missouri Pacific Railroad Co. bridge, and 0.9 mi upstream from mouth.	-	1962-77	1- 3-77 6-22-77	11 2.1
Nueces River basin						
08204000	Leona River spring flow near Uvalde, Tex.	Lat 29°09'10", long 99°44'30", Uvalde County, at old road crossing on White's Ranch, 2.0 mi downstream from Cooks Slough, and 4.7 mi south-east of Uvalde.	(c)	1939-65*, 1966-77	11- 2-76 11-30-76 12-30-76 1-31-77 2-28-77 3-30-77 4-27-77 5-25-77 6-29-77 7-28-77 9-28-77	75 75 84 85 80 64 73 85 58 53 53
Rio Grande basin						
08425500	Phantom Lake Spring near Toyahvale, Tex.	Lat 30°56'01", long 103°50'43", Jeff Davis County, 375 ft downstream from source of spring, 3.5 mi southwest of Toyahvale, and 7.0 mi southwest of Balmorhea.	(c)	1931-33*, 1942-66*, 1967-77	10- 6-76 11-18-76 1- 5-77 2-15-77 3-29-77 6-28-77 8- 9-77 9-14-77	7.9 6.7 5.7 4.9 4.9 4.0 3.9 3.6
08427000	Giffin Springs at Toyahvale, Tex.	Lat 30°56'51", long 103°47'19", Reeves County, 2,000 ft northwest of Post Office in Toyahvale.	(c)	1919, 1922-23, 1925, 1932-33*, 1941-77	1- 5-77 8- 9-77	2.5 2.2
08427500	San Solomon Springs at Toyahvale, Tex.	Lat 30°56'34", long 103°47'16", Reeves County, on South Canal at Toyahvale, 540 ft downstream from headgate at pool of springs, and 4.0 mi southwest of Balmorhea.	(c)	1931-33*, 1941-65*, 1966-77	10- 6-76 2-15-77 3-29-77 5-10-77 6-28-77 8- 9-77 9-14-77	35 35 33 28 26 28 26
08444500	Comanche Springs at Fort Stockton, Tex.	Lat 30°53'20", long 102°51'59", Pecos County, on outlet canal of Pecos County Water Improvement District No. 1 in Fort Stockton, 0.2 mi upstream from bridge on U.S. Highway 290, and 0.5 mi downstream from head of springs.	(c)	1899- 1935, 1936-64*, 1965-77	1- 5-77 9-10-77	0 0

\* Operated as a continuous-record station.

c Not applicable

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Discharge measurements made at low-flow partial-record stations during water year 1977--Continued

Discharge measurements made at Fort Clark partial record stations during water year 1977						
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
Rio Grande basin--Continued						
08456300 k/	Las Moras Springs at Brackettville, Tex.	Lat 29°18'33", long 100°25'13", Kinney County, in springflow pool at Brackettville, 160 ft south of U.S. Highway 90, and 1,550 ft upstream from bridge on Brackettville-Fort Clark Road.	(c)	1896, 1899- 1900, 1902, 1904-6, 1910, 1912, 1925, 1928, 1951-77	10-12-76 11- 9-76 12-15-76 1-11-77 2-16-77 3-16-77 4-12-77 6- 4-77 7-12-77 8- 9-77 9-13-77	39 42 44 42 39 38 34 39 34 27 18

c Not applicable

k Records for the current year were furnished by the International Boundary and Water Commission.



## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

## Crest-stage partial-record stations

The following table contains annual maximum stage and (or) discharge at partial-record stations operated primarily for the purpose of defining the flooding characteristics of the streams. At stations where discharge is given, or is footnoted "to be determined", a stage-discharge relation has been, or will be, defined by discharge measurements obtained by current meter or by indirect procedures. Water-stage recorders are located at these flood-hydrograph stations to facilitate complete hydrograph definition. At stations where only the maximum stage is given (discharge column is dashed), data are generally collected for use in stage-frequency studies or flood-profile definition. Gages at these stations usually consist of a device that will register the peak stage occurring between inspections of the gage. The years used in the column "Period of record" identify the years in which the annual maximum has been determined.

## Annual maximum stage and (or) discharge during water year 1977

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
Colorado River basin							
08155200	Barton Creek at State Highway 71 near Oak Hill, Tex.	Lat 30°17'46", long 97°55'31", Travis County, at downstream side of bridge on State Highway 71, 0.1 mi downstream from Little Barton Creek, and 5.8 mi northwest of Oak Hill.	89.7	1975-77	4-15-77	9.03	2,900
08155550	West Bouldin Creek at Riverside Drive, Austin, Tex.	Lat 30°15'49", long 97°45'17", Travis County, on upstream side of eastbound bridge on Riverside Drive in Austin.	3.12	1975-77	4-13-77	2.93	1,320
08156650	Shoal Creek at Steck Avenue, Austin, Tex.	Lat 30°21'55", long 97°44'11", Travis County, on downstream side of bridge on Steck Avenue in Austin.	3.19	1975-77	4-15-77	2.41	255
08156750	Shoal Creek at White Rock Drive, Austin, Tex.	Lat 30°20'21", long 97°44'50", Travis County, on downstream side of bridge on White Rock Drive in Austin.	7.56	1975-77	4-15-77	8.31	660
08156800	Shoal Creek at 12th Street, Austin, Tex.	Lat 30°16'35", long 97°45'00", Travis County, on downstream side of bridge on 12th Street in Austin.	12.8	1975-77	4-15-77	8.50	990
08158050	Boggy Creek at U.S. Highway 183, Austin, Tex.	Lat 30°15'47", long 97°40'20", Travis County, on downstream side of northbound bridge on U.S. Highway 183 in Austin.	13.1	1975-77	4-19-77	10.71	1,560
08158100	Walnut Creek at Farm Road 1325 near Austin, Tex.	Lat 30°24'35", long 97°42'41", Travis County, on downstream side of bridge on Farm Road 1325 and 9.5 mi north of the State Capitol building in Austin.	12.6	1975-77	4-19-77	4.42	216
08158200	Walnut Creek at Dessau Road, Austin, Tex.	Lat 30°22'30", long 97°39'37", Travis County, on downstream side of bridge on Dessau Road and 8.4 mi northeast of the State Capitol building in Austin.	26.2	1975-77	4-19-77	9.30	1,440
08158400	Little Walnut Creek at Interstate Highway 35, Austin, Tex.	Lat 30°20'57", long 97°41'34", Travis County, on downstream frontage road bridge on Interstate Highway 35 in Austin.	5.57	1975-77	4-19-77	3.70	1,200
08158500	Little Walnut Creek at Manor Road, Austin, Tex.	Lat 30°18'34", long 97°40'04", Travis County, on downstream side of bridge on Manor Road in Austin.	12.1	1975-77	4-19-77	5.95	1,010
08158880	Boggy Creek (South) at Circle S Road, Austin, Tex.	Lat 30°10'50", long 97°46'55", Travis County, on downstream side of bridge on Circle S Road in Austin.	3.58	1976-77	9-19-77	7.72	1,670
08158930	Williamson Creek at Manchaca Road, Austin, Tex.	Lat 30°13'16", long 97°47'36", Travis County, on downstream side of bridge on Manchaca Road in Austin.	19.0	1975-77	4-15-77	5.75	764
Guadalupe River basin							
08169500	Guadalupe River at New Braunfels, Tex.	Lat 29°41'52", long 98°06'23", Comal County, at Comal Mills in New Braunfels and 0.4 mi upstream from Interstate Highway 35.	1,652	1898-1902, 1915-27*, 1974-77	4-20-77	13.00	9,400
08173900	Guadalupe River at Gonzales, Tex.	Lat 29°29'49", long 97°27'17", Gonzales County, at Gonzales Hydro Station in Gonzales and 1.4 mi upstream from U.S. Highway 183.	-	1977	4-21-77	32.76	42,700
08177900	San Antonio River at Navarro Street, San Antonio, Tex.	Lat 29°25'50", long 98°29'24", Bexar County, at bridge on Navarro Street in San Antonio.	-	1973-77	4-19-77	e642.80	-
08178100	San Pedro Creek at Santa Rosa Street, San Antonio, Tex.	Lat 29°25'51", long 98°29'49", Bexar County, at bridge on Santa Rosa Street in San Antonio.	-	1973-77	4-19-77	e646.13	-
08178350	Martinez Creek at Fredericksburg Road, San Antonio, Tex.	Lat 29°27'22", long 98°31'04", Bexar County, at bridge on Fredericksburg Road in San Antonio.	-	1973-77	4-19-77	e683.20	-

\* Operated as a continuous-record station.

e Elevation in feet above mean sea level.

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Annual maximum stage and (or) discharge during water year 1977--Continued

Annual maximum stage and (or) discharge during water year 1977--Continued							
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Guadalupe River basin--Continued							
08178400	Alazan Creek at West Martin Street, San Antonio, Tex.	Lat 29°25'51", long 98°30'51", Bexar County, at bridge on West Martin Street in San Antonio.	-	1973-77	4-19-77	e641.52	-
08178450	Apache Creek at South Zarzamora Street, San Antonio, Tex.	Lat 29°24'47", long 98°31'42", Bexar County, at bridge on South Zarzamora Street in San Antonio.	-	1973-77	10-15-76	e631.39	-
08178500	San Pedro Creek at Furnish Street, San Antonio, Tex.	Lat 29°24'22", long 98°30'38", Bexar County, at bridge on Furnish Street in San Antonio.	-	1973-77	4-19-77	e609.86	-
08178550	San Antonio River at Ashley Street (Berg's Mill), San Antonio, Tex.	Lat 29°20'04", long 98°27'20", Bexar County, at bridge on Ashley Street in San Antonio.	-	1973-77	4-20-77	e518.03	-
08178720	Salado Creek at Rittiman Road, San Antonio, Tex.	Lat 29°29'05", long 98°24'59", Bexar County, at bridge on Rittiman Road in San Antonio.	-	1968-77	4-20-77	e660.26	-
08178740	Salado Creek at East Houston Street, San Antonio, Tex.	Lat 29°25'27", long 98°25'55", Bexar County, at bridge on East Houston Street in San Antonio.	-	1969-77	4-20-77	e603.67	-
08178760	Salado Creek at U.S. Highway 87, San Antonio, Tex.	Lat 29°23'53", long 98°25'35", Bexar County, at bridge on U.S. Highway 87 in San Antonio.	-	1969-77	4-20-77	e582.90	-
08178780	Salado Creek at Southcross Boulevard, San Antonio, Tex.	Lat 29°22'28", long 98°25'32", Bexar County, at bridge on Southcross Boulevard in San Antonio.	-	1969-77	4-20-77	e557.06	-
Nueces River basin							
08207300	Atascosa River at U.S. Highway 281, Pleasanton, Tex.	Lat 28°57'44", long 98°28'51", Atascosa County, at bridge on U.S. Highway 281 in Pleasanton.	-	1973-77	4-14-77	e345.93	-
San Fernando Creek basin							
08212300	Tranquitas Creek at Kingsville, Tex.	Lat 27°31'33", long 97°52'02", Kleberg County, at bridge on U.S. Highway 77 Business Route in Kingsville, 4.9 mi above San Fernando Creek, and 5.9 mi downstream from Tranquitas Dam.	48.5	1965-77	10- 5-76	3.30	-

e Elevation in feet above mean sea level.

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Measurements of streamflow at points other than gaging stations of partial-record stations are given in the following table:

Discharge measurements made at miscellaneous sites during water year 1977						
Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Guadalupe River basin						
Olmos Creek	San Antonio River	Lat 29°29'06", long 98°29'49", Bexar County, at Devine Road above Olmos Park at San Antonio, Tex.	-	1974-76	1-21-77	1.7
San Antonio Springs	.....do.....	Lat 29°27'56", long 98°28'04", Bexar County, just above Hildebrand Street in San Antonio, Tex.	-	1951-52, 1959-62, 1972, 1974-76	1-21-77	150
San Pedro Springs	San Pedro Creek	Lat 29°26'42", long 88°30'06", Bexar County, at San Pedro Park in San Antonio, Tex.	-	1933-35, 1951-52, 1958-61, 1966, 1971, 1974-76	1-21-77 3-11-77 6- 9-77	17 17 13
Nueces River basin						
Frio River	Nueces River	Lat 29°26'48", long 99°39'57", Uvalde County, at Farm Road 2690 and 5.2 mi southeast of Concan, Tex.	-	-	1- 7-77	152
.....do.....	.....do.....	Lat 29°21'16", long 99°39'28", Uvalde County, at Verstuyft Farm and 4.4 mi north of Knippa, Tex.	-	-	1- 7-77	50
.....do.....	.....do.....	Lat 29°19'48", long 99°39'14", Uvalde County, at county road and 2.8 mi north of Knippa, Tex.	-	-	1- 7-77	10
.....do.....	.....do.....	Lat 29°19'30", long 99°39'25", Uvalde County, 2.4 mi north of Knippa, Tex.	-	-	1- 6-77	0
Dry Frio River	Frio River	Lat 29°26'55", long 99°45'42", Uvalde County, at U.S. Highway 83 and 3.0 mi west of Concan, Tex.	-	-	1- 6-77	0
.....do.....	.....do.....	Lat 29°22'25", long 99°42'13", Uvalde County, at Farm Road 2690 and 12.2 mi northeast of Uvalde, Tex.	-	-	1- 6-77	0
Rio Grande basin						
Mud Springs <u>1/</u>	Mud Creek	Lat 29°27'10", long 100°37'30", Kinney County, on Mays Ranch and about 16 mi northwest of Brackettville, Tex.	-	1939-41, 1952-53, 1962, 1965-76	10-12-76 11- 9-76 12-15-76 1-11-77 2-16-77 3-16-77 4-12-77 5-19-77 6-21-77 7-12-77 8- 9-77 9-13-77	25 29 29 28 32 34 30 30 28 30 30 27
Pinto Springs <u>1/</u>	Pinto Creek	Lat 29°24'10", long 100°27'15", Kinney County, on C. C. Belcher Ranch and 7.5 mi northwest of Brackettville, Tex.	-	1939-41, 1952-53, 1965-76	10-12-76 11- 9-76 12-15-76 1-11-77 2-16-77 3-16-77 4-12-77 5-19-77 6- 4-77 7-12-77 8- 9-77 9-13-77	25 33 32 31 27 20 21 26 5.6 13 8.0 8.6

1/ Measurements by International Boundary and Water Commission.

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## FACTORS FOR CONVERTING U.S. CUSTOMARY UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the U.S. customary units published herein to the International System of Units (SI). Subsequent reports will contain both the U.S. customary and SI unit equivalents in the station manuscript descriptions until such time that all data will be published in SI units.

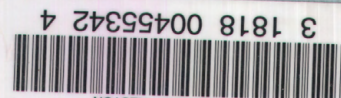
Multiply U.S. customary units	By	To obtain SI units
<i>Length</i>		
inches (in)	$2.54 \times 10^1$	millimeters (mm)
	$2.54 \times 10^{-2}$	meters (m)
feet (ft)	$3.048 \times 10^{-1}$	meters (m)
miles (mi)	$1.609 \times 10^0$	kilometers (km)
<i>Area</i>		
acres	$4.047 \times 10^3$	square meters (m <sup>2</sup> )
	$4.047 \times 10^{-1}$	square hectometers (hm <sup>2</sup> )
	$4.047 \times 10^{-3}$	square kilometers (km <sup>2</sup> )
square miles (mi <sup>2</sup> )	$2.590 \times 10^0$	square kilometers (km <sup>2</sup> )
<i>Volume</i>		
gallons (gal)	$3.785 \times 10^0$	liters (L)
	$3.785 \times 10^0$	cubic decimeters (dm <sup>3</sup> )
	$3.785 \times 10^{-3}$	cubic meters (m <sup>3</sup> )
million gallons	$3.785 \times 10^3$	cubic meters (m <sup>3</sup> )
	$3.785 \times 10^{-3}$	cubic hectometers (hm <sup>3</sup> )
cubic feet (ft <sup>3</sup> )	$2.832 \times 10^1$	cubic decimeters (dm <sup>3</sup> )
	$2.832 \times 10^{-2}$	cubic meters (m <sup>3</sup> )
cfs-days	$2.447 \times 10^3$	cubic meters (m <sup>3</sup> )
	$2.447 \times 10^{-3}$	cubic hectometers (hm <sup>3</sup> )
acre-feet (acre-ft)	$1.233 \times 10^3$	cubic meters (m <sup>3</sup> )
	$1.233 \times 10^{-3}$	cubic hectometers (hm <sup>3</sup> )
	$1.233 \times 10^{-6}$	cubic kilometers (km <sup>3</sup> )
<i>Flow</i>		
cubic feet per second (ft <sup>3</sup> /s)	$2.832 \times 10^1$	liters per second (L/s)
	$2.832 \times 10^1$	cubic decimeters per second (dm <sup>3</sup> /s)
	$2.832 \times 10^{-2}$	cubic meters per second (m <sup>3</sup> /s)
gallons per minute (gal/min)	$6.309 \times 10^{-2}$	liters per second (L/s)
	$6.309 \times 10^{-2}$	cubic decimeters per second (dm <sup>3</sup> /s)
	$6.309 \times 10^{-5}$	cubic meters per second (m <sup>3</sup> /s)
million gallons per day	$4.381 \times 10^1$	cubic decimeters per second (dm <sup>3</sup> /s)
	$4.381 \times 10^{-2}$	cubic meters per second (m <sup>3</sup> /s)
<i>Mass</i>		
tons (short)	$9.072 \times 10^{-1}$	megagrams (Mg) or metric tons



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