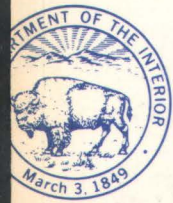
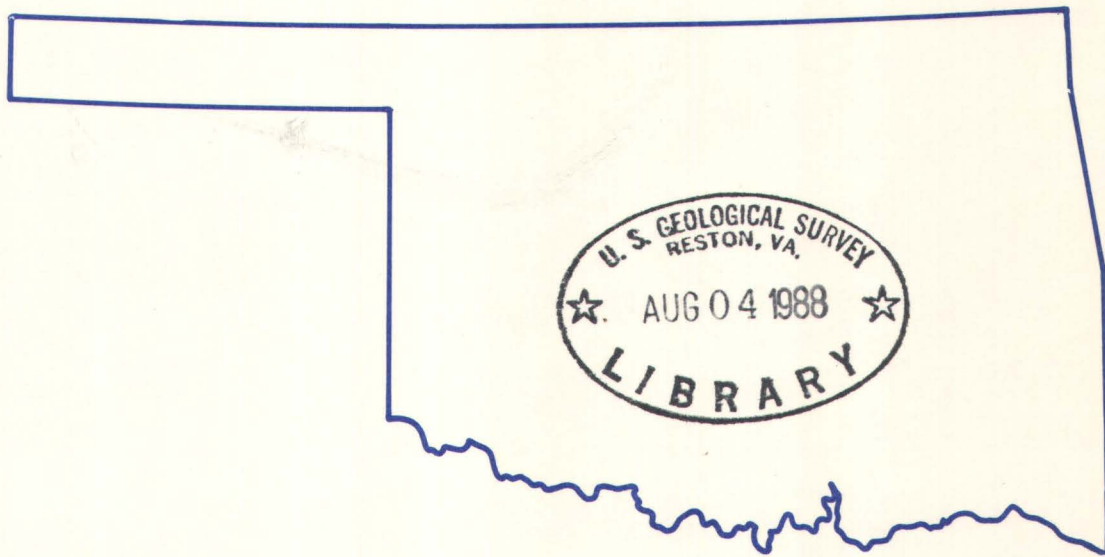


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1986



# Water Resources Data Oklahoma Water Year 1986



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OK-86-1  
Prepared in cooperation with the State of Oklahoma  
and with other agencies



## FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI). This report contains both the inch-pound and SI unit equivalents in the station manuscript descriptions.

Multiply inch-pound 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

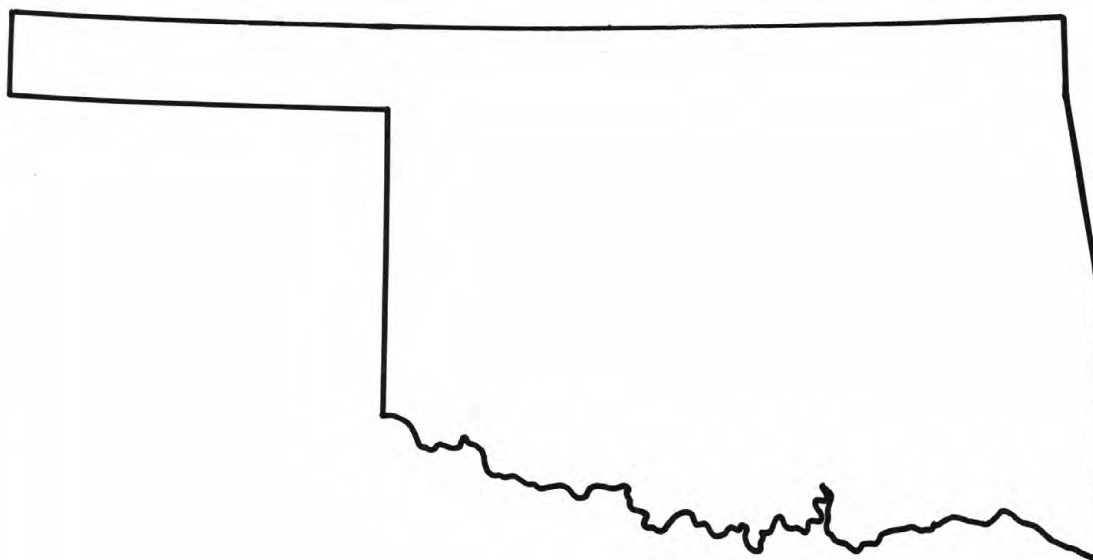




# Water Resources Data Oklahoma

## Water Year 1986

by L.D. Hauth, J.K. Kurklin, and D.M. Walters



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OK-86-1

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



DEPARTMENT OF THE INTERIOR  
DONALD PAUL HODEL, Secretary

U.S. GEOLOGICAL SURVEY  
Dallas L. Peck, Director

For information on the water program in Oklahoma write to  
District Chief, Water Resources Division  
U.S. Geological Survey  
215 Dean A. McGee Avenue, Room 621  
Oklahoma City, Oklahoma 73102

1986



#### PREFACE

This hydrologic-data report for Oklahoma is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface-water data-collection network in each state, Puerto Rico, and the Trust Territories. These records of streamflow and water quality provide the hydrologic information needed by state, local, and federal agencies, and the private sector for developing and managing our Nation's land and water resources.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. The authors had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines.

Report preparation was under the direct supervision of Joanne K. Kurklin, Hydrologic Records Unit Chief. The data were collected, computed, and processed by the following personnel:

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<b>REPORT DOCUMENTATION PAGE</b>	<b>1. REPORT NO.</b> USGS/WRD/HD-88/228	<b>2.</b>	<b>3. Recipient's Accession No.</b>
<b>4. Title and Subtitle</b>  Water Resources Data for Oklahoma, Water Year 1986			<b>5. Report Date</b> April 1988
<b>7. Author(s)</b> L.D. Hauth, J.K. Kurklin, D.M. Walters, and T.E. Coffey			<b>6.</b>
<b>9. Performing Organization Name and Address</b> U.S. Geological Survey Water Resources Division 215 Dean A. McGee Avenue, Room 621 Oklahoma City, OK 73102			<b>8. Performing Organization Rept. No.</b> USGS-WRD-OK-86-1
<b>12. Sponsoring Organization Name and Address</b> U.S. Geological Survey Water Resources Division 215 Dean A. McGee Avenue, Room 621 Oklahoma City, OK 73102			<b>10. Project/Task/Work Unit No.</b>
			<b>11. Contract(C) or Grant(G) No.</b>  (C)  (G)
			<b>13. Type of Report &amp; Period Covered</b> Annual - Oct. 1, 1985 to Sept. 30, 1986
<b>15. Supplementary Notes</b>  Prepared in cooperation with the State of Oklahoma and with other agencies.			<b>14.</b>
<b>16. Abstract (Limit: 200 words)</b>  Water resources data for the 1986 water year for Oklahoma consists of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes or reservoirs. This report contains discharge records for 126 gaging stations; stage and contents for 29 lakes or reservoirs; water quality for 40 gaging stations and 3 lakes. Also included are 3 partial-record stations. These data represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Oklahoma.			
<b>17. Document Analysis a. Descriptors</b>  *Oklahoma, *Hydrologic data, *Surface water, *Water quality, Flow rate, Gaging stations, Lakes, Reservoirs, Chemical analyses, Sediment, Water temperature, Sampling sites, Water analyses.  <b>b. Identifiers/Open-Ended Terms</b>          <b>c. COSATI Field/Group</b>			
<b>18. Availability Statement:</b> No restriction on distribution. This report may be purchased from: National Technical Information Service, Springfield, VA 22161		<b>19. Security Class (This Report)</b> UNCLASSIFIED	<b>21. No. of Pages</b> 316
		<b>20. Security Class (This Page)</b> UNCLASSIFIED	<b>22. Price</b>



## CONTENTS

	Page
Preface.....	iii
List of surface-water stations, in downstream order, for which records are published.....	vi
Introduction.....	1
Cooperation.....	1
Summary of hydrologic conditions.....	2
Streamflow.....	2
Chemical quality of streamflow.....	2
Special networks and programs.....	3
Explanation of records.....	4
Station identification numbers.....	4
Downstream order system.....	4
Latitude-longitude system.....	4
Records of stage and water discharge.....	5
Data collection and computation.....	5
Data presentation.....	6
Accuracy of the records.....	7
Other records available.....	7
Records of surface-water quality.....	7
Classification of records.....	8
Arrangement of records.....	8
On-site measurements and sample collection.....	8
Water temperature.....	8
Sediment.....	8
Laboratory measurements.....	9
Data presentation.....	9
Remark codes.....	9
Definition of terms.....	10
Publications on Techniques of Water-Resources Investigations.....	17
Station records.....	23
Discharge at partial-record stations.....	311
Crest-stage partial-record stations.....	311
Low-flow partial-record stations.....	311
Index.....	313

## ILLUSTRATIONS

Figures 1-3. Maps of Oklahoma showing:	
1. Locations of continuous-record surface-water stations, water year 1986....	19
2. Locations of partial-record stations, water year 1986.....	20
3. Locations of quality-water stations, water year 1986.....	21

[Letters after station name designate type of data: (d) discharge, (c) chemical, (b) biological, (e) contents, (m) microbiological, (t) water temperature, (s) sediment]

	Page
<u>LOWER MISSISSIPPI RIVER BASIN</u>	
<u>MISSISSIPPI RIVER</u>	
ARKANSAS RIVER BASIN	
Kaw Lake near Ponca City (e).....	23
Arkansas River near Ponca City (d).....	24
Salt Fork Arkansas River near Winchester (d).....	25
Salt Fork Arkansas River near Alva (d).....	26
Great Salt Plains Lake near Jet (e).....	27
Salt Fork Arkansas River near Jet (dct).....	28
Salt Fork Arkansas River at Tonkawa (d).....	32
Chikaskia River near Blackwell (d).....	33
Arkansas River at Ralston (dcmts).....	34
Black Bear Creek at Pawnee (d).....	39
Cimarron River near Kenton (d).....	40
Cimarron River near Forgan (d).....	41
Cimarron River near Englewood (dcs).....	42
Cimarron River near Buffalo (dcmts).....	45
Buffalo Creek near Lovedale (d).....	48
Cimarron River near Waynoka (d).....	49
Cimarron River near Dover (d).....	50
Cottonwood Creek near Navina (dcs).....	51
Cimarron River near Guthrie (d).....	54
Skeleton Creek near Lovell (d).....	55
Cimarron River at Perkins (dcmts).....	56
Council Creek near Stillwater (d).....	60
Keystone Lake near Sand Springs (e).....	61
Arkansas River at Tulsa (dcmts).....	62
Polecat Creek:	
Heyburn Lake near Heyburn (e).....	65
Arkansas River near Haskell (d).....	66
Verdigris River near Lenapah (d).....	67
Oologah Lake near Oologah (e).....	68
Verdigris River near Oologah (d).....	69
Hulah Lake near Hulah (e).....	70
Caney River near Hulah (d).....	71
Little Caney River:	
Copan Lake near Copan (e).....	72
Caney River above Coon Creek near Bartlesville (d).....	73
Sand Creek at Okesa (d).....	74
Caney River near Ramona (dc).....	75
Verdigris River near Claremore (d).....	79
Bird Creek:	
Birch Lake near Barnsdall (e).....	80
Birch Creek below Birch Lake near Barnsdall (d).....	81
Bird Creek at Avant (d).....	82
Skiatook Lake near Skiatook (e).....	83
Hominy Creek near Skiatook (d).....	84
Bird Creek near Sperry (d).....	86
Bird Creek near Catoosa (c).....	87
Verdigris River near Inola (cms).....	89
Neosho River near Commerce (d).....	91
Tar Creek at 22nd Street Bridge at Miami (d).....	92
Spring River near Quapaw (d).....	93
Elk River near Tiff City, MO (d).....	94
Lake O' The Cherokees at Langley (e).....	95
Neosho River near Langley (d).....	96
Big Cabin Creek near Big Cabin (d).....	97
Spavinaw Creek near Sycamore (dc).....	98
Lake Hudson near Locust Grove (e).....	101
Neosho River near Chouteau (d).....	102
Fort Gibson Lake near Fort Gibson (e).....	104
Neosho River below Fort Gibson near Fort Gibson (dcmts).....	105
Illinois River near Watts (d).....	108
Flint Creek near Kansas (d).....	109
Illinois River near Tahlequah (d).....	110
Baron Fork at Eldon (d).....	111
Tenkiller Ferry Lake near Gore (e).....	112
Illinois River near Gore (dc).....	113
Canadian River at Bridgeport (dcs).....	116
Canadian River at Purcell (d).....	122
Walnut Creek at Purcell (d).....	123
Little River:	
Lake Thunderbird near Norman (ebcm).....	124
Little River below Lake Thunderbird near Norman (d).....	134
Little River near Tecumseh (d).....	135
Little River near Bowlegs (dc).....	136
Little River near Sasakwa (dc).....	139
Canadian River at Calvin (dcmts).....	142



## LOWER MISSISSIPPI RIVER BASIN--Continued

## MISSISSIPPI RIVER--Continued

## ARKANSAS RIVER BASIN--Continued

## Canadian River--Continued

Beaver River near Guymon (d).....	145
Coldwater Creek near Guymon (d).....	146
Optima Lake near Hardesty (e).....	147
Beaver River near Hardesty (d).....	148
Beaver River at Beaver (dcms).....	149
Clear Creek near Elmwood (d).....	152
North Canadian River:	
Fort Supply Lake near Fort Supply (e).....	153
Wolf Creek near Fort Supply (d).....	154
North Canadian River at Woodward (dcms).....	155
North Canadian River near Selling (d).....	158
Canton Lake near Canton (ec).....	159
North Canadian River at Canton (d).....	166
North Canadian River below Weavers Creek near Watonga (d).....	167
North Canadian River near El Reno (d).....	168
Lake Hefner Canal near Oklahoma City (d).....	169
Lake Overholser near Oklahoma City (e).....	170
North Canadian River below Lake Overholser near Oklahoma City (d).....	171
North Canadian River near Harrah (dcmts).....	172
North Canadian River near Wetumka (dcmts).....	184
Deep Fork near Arcadia (dcs).....	189
Deep Fork near Warwick (d).....	191
Dry Creek near Kendrick (d).....	192
Deep Fork near Beggs (dcmts).....	193
Eufaula Lake near Broken (e).....	197
Canadian River near Whitefield (dcmts).....	198
Robert S. Kerr Lock and Dam (Arkansas River) near Sallisaw (c).....	203
Poteau River:	
Fourche Maline near Red Oak (d).....	205
Wister Lake near Wister (e).....	206

## RED RIVER BASIN

## Red River:

Salt Fork Red River at Mangum (d).....	207
Salt Fork Red River near Elmer (dcms).....	208
North Fork Red River:	
Sweetwater Creek near Sweetwater (d).....	211
North Fork Red River near Carter (d).....	212
Lake Altus at Lugert (e).....	213
North Fork Red River below Altus Dam near Lugert (d).....	214
Elk Creek near Hobart (dct).....	215
North Fork Red River near Headrick (dcmts).....	219
Otter Creek:	
West Otter Creek at Snyder Lake near Mountain Park (d).....	223
North Fork Red River near Tipton (d).....	224
Red River near Burkburnett, TX (dc).....	225
Cache Creek:	
East Cache Creek near Walters (dc).....	228
West Cache Creek:	
Blue Beaver Creek near Cache (dcms).....	230
Deep Red Run near Randlett (d).....	232
Waurika Lake near Waurika (e).....	234
Beaver Creek near Waurika (d).....	235
Red River near Terral (dc).....	236
Mud Creek near Courtney (d).....	240
Red River near Gainesville, TX (dc).....	241
Washita River near Cheyenne (d).....	245
Washita River near Hammon (dct).....	246
Foss Reservoir near Foss (ec).....	250
Washita River near Foss (dct).....	255
Washita River near Clinton (d).....	259
Washita River at Carnegie (dct).....	260
Cobb Creek near Eakly (d).....	264
Fort Cobb Reservoir near Fort Cobb (e).....	265
Cobb Creek near Fort Cobb (d).....	266
Washita River at Anadarko (d).....	267
Little Washita River near Ninnekah.....	268
Winter Creek near Alex (d).....	269
Washita River at Alex (d).....	270
Washita River near Pauls Valley (d).....	271
Rush Creek at Purdy (d).....	272
Wildhorse Creek near Hoover (d).....	273
Antelope Spring at Sulphur (d).....	274
Vendome Well at Sulphur (d).....	275
Washita River near Dickson (dcms).....	276
Lake Texoma near Denison, TX (e).....	282

LOWER MISSISSIPPI RIVER BASIN--Continued

MISSISSIPPI RIVER--Continued

RED RIVER BASIN--Continued

Red River--Continued

Red River at Dension Dam near Denison, TX (dc)..... 283

Blue River at Milburn (d)..... 287

Blue River near Blue (d)..... 288

Muddy Boggy Creek near Farris (d)..... 289

Clear Boggy Creek:

Big Springs Creek:

Byrds' Mill Spring near Fittstown (d)..... 290

Clear Boggy Creek near Caney (d)..... 291

Muddy Boggy Creek near Unger (d)..... 292

Red River at Arthur City, TX (d)..... 293

Kiamichi River near Big Cedar (dcms)..... 294

Jackfork Creek:

Sardis Lake near Clayton (e)..... 297

Kiamichi River at Clayton (d)..... 298

Kiamichi River near Antlers (d)..... 299

Hugo Lake near Hugo (e)..... 300

Red River near De Kalb, TX (dc)..... 301

Pine Creek Lake near Wright City (e)..... 305

Little River near Wright City (d)..... 306

Glover Creek near Glover (d)..... 307

Little River below Lukfata Creek near Idabel (d)..... 308

Broken Bow Lake near Broken Bow (e)..... 309

Mountain Fork near Eagletown (d)..... 310



## WATER RESOURCES DATA - OKLAHOMA, 1986

### INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with State agencies, obtains a large amount of data pertaining to the water resources of Oklahoma each water year (October 1 to September 30). These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the Geological Survey, the data are published annually in this report series entitled "Water Resources Data - Oklahoma."

This report includes records on surface water in the State. Specifically, it contains: (1) Discharge records for 126 streamflow-gaging stations, and 3 partial-record or miscellaneous streamflow stations, (2) stage and content records for 29 lakes and reservoirs; and (3) water-quality records for 40 streamflow-gaging stations, and 3 lakes.

This series of annual reports for Oklahoma began with the 1961 water year with a report that contained only data relating to the quantities of surface water. For the 1964 water year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to present, in one volume, data on quantity and quality of surface water.

Prior to introduction of this series and for several water years concurrent with it, water-resources data for Oklahoma were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface Water Supply of the United States, Parts 7A and 7B." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States." The above mentioned Water-Supply Papers may be consulted in the libraries of the principal cities of the United States and may be purchased from Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, CO 80225.

Publications similar to this report are published annually by the Geological Survey for all States. These official Survey reports have 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 volume is identified as "U.S. Geological Survey Water-Data Report OK-86-1." For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

Additional information, including current prices, for ordering specific reports may be obtained from the District Chief at the address given on back of title page or by telephone (405) 231-4256.

### COOPERATION

The U.S. Geological Survey and organizations of the State of Oklahoma have had cooperative agreements for the systematic collection of streamflow records since 1935, and for water quality records since 1941. Organizations that assisted in collecting the data through cooperative agreement with the Survey are:

Oklahoma Water Resources Board, Gerald E. Borelli, Chairman  
and James R. Barnett, Executive Director.  
Oklahoma Department of Transportation, Richard A. Ward, Chief Engineer.  
Oklahoma Geological Survey, Charles J. Mankin, Director.  
Oklahoma State Department of Health, Environmental Health Services, Mark S. Coleman,  
Deputy Commissioner.  
Oklahoma City Water Department, Earl Potts, Director of Water Services.

The following Federal agencies assisted in the data collection program by providing funds or services:

Corps of Engineers, U.S. Army  
Bureau of Reclamation, U.S. Department of Interior  
Bureau of Land Management, U.S. Department of Interior

Assistance in the form of funds or services was rendered by the city of Oklahoma City and the following organizations through the Oklahoma Water Resources Board: Grand River Dam Authority; Central Oklahoma Master Conservancy District; Fort Cobb Reservoir Master Conservancy District; Lugert-Altus Irrigation District; Foss Reservoir Master Conservancy District; Mountain Park Master Conservancy District; Oklahoma Gas and Electric Company; the cities of Ada, Altus, Claremore, Lawton, Sapulpa, and Tulsa.

Organizations that supplied data are acknowledged in the station descriptions.

## SUMMARY OF HYDROLOGIC CONDITIONS

Streamflow

Streamflow in the State was greater than average, except for the northwestern one-fourth of the State where streamflow was less than average. Intense rains during the last 2 days of the water year caused flooding in the northeastern part of the State with several peaks not occurring until the first part of water year 1987.

Discharge at the index station in south-central Oklahoma, Washita River near Dickson, was in the upper 75-percent quartile for the year. Reservoir contents were near normal for the year.

Chemical Quality of Streamflow

The concentrations of selected dissolved chemical constituents measured at surface-water sampling stations in the State during water year 1986 generally were within the ranges measured during previous years. Concentrations of dissolved solids, chloride, sulfate, and suspended sediment are shown in the following tables for sampling sites on selected principal streams in the State. Maximum and minimum concentrations of these constituents for water year 1986 are compared to maximum and minimum concentrations for water years 1970 through 1985.

The maximum dissolved-solids concentration measured in these streams in 1986 was 13,600 mg/L in the Cimarron River near Buffalo. This concentration is considered normal for the station. The minimum dissolved-solids concentration measured in the Arkansas River at Ralston was less than the concentrations for water years 1970 through 1985. Dissolved-solids concentrations, in milligrams per liter, are listed in the following table:

Station Identification	Water Year 1986		Water Years 1970-85	
	Maximum	Minimum	Maximum	Minimum
07152500 Arkansas River at Ralston	902	89	2,550	139
07157950 Cimarron River near Buffalo	13,600	5,430	49,200	601
07161000 Cimarron River near Perkins	6,660	1,620	15,700	338
07164500 Arkansas River at Tulsa	1,400	787	2,400	108
07193500 Neosho River below Fort Gibson	197	124	213	102
07231500 Canadian River near Calvin	1,020	397	1,880	85
07234000 Beaver River near Beaver	4,120	2,710	4,320	164
07237500 North Canadian River near Woodward	1,420	784	3,110	626
07242000 North Canadian River near Wetumka	808	158	1,650	119
07243500 Deep Fork near Beggs	748	350	1,720	86
07301110 Salt Fork Red River near Elmer	4,060	3,230	4,450	192
07305000 North Fork Red River near Headrick	7,460	2,500	17,100	208
07311200 Blue Beaver Creek near Cache	118	73	187	58
07331000 Washita River near Dickson	1,010	514	1,460	139
07335700 Kiamichi River near Big Cedar	39	19	45	8

The maximum dissolved-chloride concentration measured at the selected stations in 1986 was 7,300 mg/L in the Cimarron River near Buffalo. The concentration in Beaver River near Beaver equaled the maximum concentration for water years 1970 through 1985. Dissolved-chloride concentrations, in milligrams per liter, are listed in the following table:

Station Identification	Water Year 1986		Water Years 1970-85	
	Maximum	Minimum	Maximum	Minimum
07152500 Arkansas River at Ralston	300	5.6	1,300	19
07157950 Cimarron River near Buffalo	7,300	3,000	29,000	180
07161000 Cimarron River near Perkins	3,600	720	8,600	110
07164500 Arkansas River at Tulsa	580	310	1,100	15
07193500 Neosho River below Fort Gibson	10	5.6	24	4.5
07231500 Canadian River near Calvin	300	100	750	18
07234000 Beaver River near Beaver	1,800	1,200	1,800	14
07237500 North Canadian River near Woodward	360	70	640	140
07242000 North Canadian River near Wetumka	200	32	640	17
07243500 Deep Fork near Beggs	240	93	800	7.3
07301110 Salt Fork Red River near Elmer	950	540	1,000	15
07305000 North Fork Red River near Headrick	3,800	920	8,000	40
07311200 Blue Beaver Creek near Cache	6.5	2.5	31	3.7
07331000 Washita River near Dickson	110	25	250	6.0
07335700 Kiamichi River near Big Cedar	2.0	1.5	9.6	1.0



The maximum dissolved-sulfate concentration measured in 1986 was in the Salt Fork Red River near Elmer; however, this concentration is normal for the station. The maximum concentration in the Cimarron River near Perkins was larger than the maximum for water years 1970 through 1985. Dissolved-sulfate concentrations, in milligrams per liter, are listed in the following table:

Station identification	Water Year 1986		Water Years 1970-85	
	Maximum	Minimum	Maximum	Minimum
07152500 Arkansas River at Ralston	160	9.9	300	8.7
07157950 Cimarron River near Buffalo	710	350	2,400	7.1
07161000 Cimarron River near Perkins	790	110	690	12
07164500 Arkansas River at Tulsa	170	100	210	19
07193500 Neosho River below Fort Gibson near Fort Gibson	43	16	50	7.7
07231500 Canadian River near Calvin	230	52	380	7.0
07234000 Beaver River near Beaver	670	410	1,100	18
07237500 North Canadian River near Woodward	380	190	930	110
07242000 North Canadian River near Wetumka	150	13	280	6.2
07243500 Deep Fork near Beggs	46	25	170	2.4
07301110 Salt Fork Red River near Elmer	1,700	1,500	1,800	72
07305000 North Fork Red River near Headrick	1,100	480	2,000	24
07311200 Blue Beaver Creek near Cache	15	9.8	90	6.0
07331000 Washita River near Dickson	430	140	760	9.6
07335700 Kiamichi River near Big Cedar	6.4	4.2	9.3	.8

The maximum suspended-sediment concentration measured in 1986 at the selected stations was in the North Canadian River near Wetumka. The concentration was within the historic concentration range for this station. Suspended-sediment concentrations, in milligrams per liter, are listed in the following table:

Station identification	Water Year 1986		Water Years 1970-85	
	Maximum	Minimum	Maximum	Minimum
07152500 Arkansas River at Ralston	3,840	11	13,500	10
07157950 Cimarron River near Buffalo	203	37	12,800	2
07161000 Cimarron River near Perkins	1,780	36	17,000	15
07164500 Arkansas River at Tulsa	24	6	5,280	3
07193500 Neosho River below Fort Gibson near Fort Gibson	22	11	496	1
07231500 Canadian River near Calvin	2,860	53	30,900	9
07234000 Beaver River near Beaver	14	12	14,900	7
07237500 North Canadian River near Woodward	263	24	3,770	6
07242000 North Canadian River near Wetumka	4,290	99	14,900	12
07243500 Deep Fork near Beggs	146	24	1,470	10
07301110 Salt Fork Red River near Elmer	35	19	12,100	7
07305000 North Fork Red River near Headrick	110	5	5,520	3
07311200 Blue Beaver Creek near Cache	26	6	19	2
07331000 Washita River near Dickson	3,800	91	17,300	12
07335700 Kiamichi River near Big Cedar	22	1	154	1

#### SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of 57 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 500 or so sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

#### EXPLANATION OF THE RECORDS

The surface-water and water-quality records published in this report are for the 1986 water year that began October 1, 1985, and ended September 30, 1986. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, and water-quality data for surface water. The locations of the stations where the data were collected are shown in figures 1-3. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

#### Station Identification Numbers

Each data station in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for surface-water stations where only miscellaneous measurements are made.

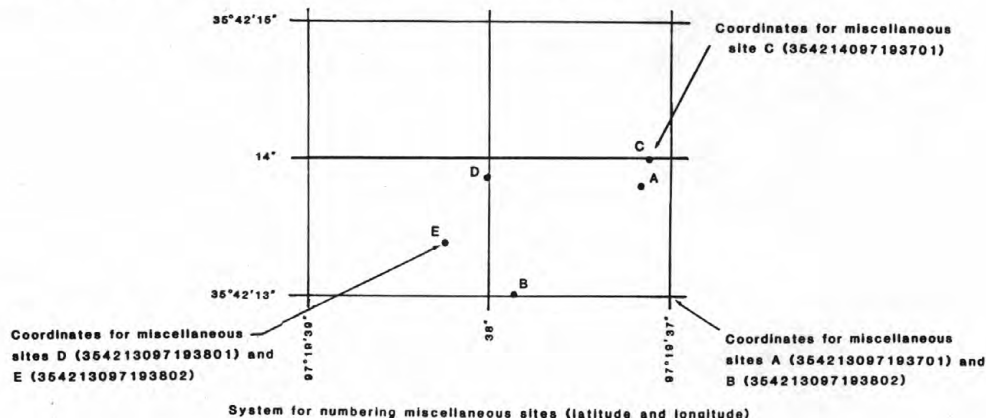
#### Downstream Order System

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 mainstream station are listed before that station. A station on a tributary that enters between two mainstream 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 with respect to the stream to which it is immediately tributary is indicated by an indentation in the "List of Stations" in the front of this 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.

The station-identification number is assigned according to downstream order. 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 complete eight-digit number for each station, such as 07152500, which appears just to the left of the station name, includes the two-digit Part number "07" plus the six-digit downstream-order number "152500." The Part number designates the major river basin; for example, part "07" is the Lower Mississippi River basin.

#### Latitude-Longitude System

The identification numbers for miscellaneous surface-water sites are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the sites within a 1-second grid. This site-identification number, once assigned, is a pure number, and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description. (See figure below.)



### Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharge may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Location of all complete-record, crest-stage partial-record, and low-flow partial-record stations for which data are given in this report are shown in figures 1-2.

### Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relationships between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relationship between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage or with digital recorders that punch stage values on paper tapes at selected time intervals. Measurements of discharge are made with current meters using methods adapted by the Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A6.

In computing discharge records, results of individual measurements are plotted against the corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. It is necessary to define extremes of discharge outside the range of the current-meter measurements, the curves are extended using: (1) logarithmic plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow-over-dams or weirs; or (4) step-backwater techniques.

Daily mean discharges are computed by applying the daily mean stages (gage heights) to the stage-discharge curves or tables. 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 determined by the shifting-control method, in which correction factors based on the individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control. For some stations, formation of ice in the winter may so obscure the stage-discharge relations that daily mean discharges must be estimated from other information such as temperature and precipitation records, notes of observations, and records for other stations in the same or nearby basins for comparable periods.

At some stream-gaging stations the stage-discharge relation is affected by the 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.

In computing records of lake or reservoir contents, it is necessary to have available from surveys, curves or tables defining the relationship of stage and content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relationship changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relationship. Even when this is done, the contents computed may become increasingly in error as time since the last survey increases. Discharges over lake or reservoir spillways are computed from stage-discharge relationships much as other stream discharges are computed.

For 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 from the recorded range in stage, previous or following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous or following record, inflow-outflow studies, and other information.



## Data Presentation

The records published for each gaging station consist of two parts, the manuscript or station description and data table for the current water year. The manuscript provides, under various headings, descriptive information, such as station location; period of record; average discharge; historical extremes; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments to follow clarify information presented under the various headings of the station description.

**LOCATION.**--Information on locations is obtained from the most accurate maps available. The location of the gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few stations, were determined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

**DRAINAGE AREA.**--Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

**PERIOD OF RECORD.**--This indicates the period for which there are published records for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not, and whose location was such that records from it can reasonably be considered equivalent with records from the present station.

**REVISED RECORDS.**--Published records, because of new information, occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted 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 most recently revised figure was first published is given.

**GAGE.**--The type of gage in current use, the datum of the current gage referred to National Geodetic Vertical Datum of 1929 (see glossary), and a condensed history of the types, locations, and datums of previous gages are given under this heading.

**REMARKS.**--This paragraph is used to present information relative to the accuracy of the records, to special methods of computation, to conditions that affect natural flow at the station and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

**COOPERATION.**--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

**AVERAGE DISCHARGE.**--The discharge value given is the arithmetic mean of the water-year mean discharges. It is computed only for stations having at least 5 water years of complete record, and only water years of complete record are included in the computation. It is not computed for stations where diversions, storage, or other water-use practices cause the value to be meaningless. If water developments significantly altering flow at a station are put into use after the station has been in operation for a period of years, a new average is computed as soon as 5 water years of record have accumulated following the development.

**EXTREMES FOR PERIOD OF RECORD.**--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Included here is information concerning major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the U.S. Geological Survey.

**EXTREMES FOR CURRENT YEAR.**--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. The peaks greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for canals, ditches, drains, or streams for which the peaks are subject to substantial control by man. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, and 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

**REVISIONS.**--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the District office to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the "Remarks" and in the inclusion of a skeleton stage-capacity table when daily contents are given.

The daily table for stream-gaging stations gives 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 is usually 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 omitted if there is extensive regulation or diversion or if the drainage area includes large noncontributing areas. In the yearly summary below the monthly summary, the figures shown are the appropriate discharges for the calendar and water years. At some stations monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversions, or diversions or reservoir contents are given. These figures are identified by a symbol and corresponding footnote.

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 annual maximum stage and discharge at crest-stage stations, and the second is a table of discharge measurements at low-flow partial-record 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. These measurements and others collected for some special reason are called measurements at miscellaneous sites.

#### Accuracy of the Records

The accuracy of streamflow records 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 measurements of stage, measurements of discharge, and interpretation of records.

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the true; "good," within 10 percent; and "fair," within 15 percent. Records that do not meet the criteria mentioned, are rated "poor." Different accuracies may be attributed to different parts of a given record.

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than  $1 \text{ ft}^3/\text{s}$ ; to the nearest tenth between  $1.0$  and  $10 \text{ ft}^3/\text{s}$ ; to whole numbers between  $10$  and  $1,000 \text{ ft}^3/\text{s}$ ; and to 3 significant figures for more than  $1,000 \text{ ft}^3/\text{s}$ . The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

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 stations, 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 Records Available

Records of discharge, not published by the Geological Survey, are collected in Oklahoma at several sites by the U.S. Army Corps of Engineers. The National Water Data Exchange (NAWDEX), U.S. Geological Survey, Reston, VA 22092, maintains an index of these sites as well as an index of records of discharge collected by other agencies but not published by the Geological Survey. Information on records at specific sites can be obtained from that office upon request.

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables are on file in the Oklahoma District office. Also, most of the daily mean discharges are in computer-readable form.

#### Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurement frequencies.

### Classification of records

Water-quality data for surface-water sites are grouped into one of three classifications. A continuing-record station is a site where data are collected on a regularly scheduled basis. Frequency may be once or more times daily, weekly, monthly, or quarterly. A partial-record station is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A miscellaneous sampling site is a location other than a continuing or partial-record station, where random samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between "continuing records" as used in this report and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 3.

### Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

### On-site Measurements and Sample Collection

In obtaining water-quality data, a major concern needs to be assuring that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for onsite measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed on p. 17 of this report. Also, detailed information on collecting, treating, and shipping samples may be obtained from the Geological Survey District Office.

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 for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network (see definitions) are obtained from at least several verticals. Whether samples are obtained from the centroid of flow or from several verticals, depends on flow conditions and other factors must be evaluated by the collector.

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 a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is 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.

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 U.S. Geological Survey District Office whose address is given on the back of the title page of this report.

### Water temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

### 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 sections.

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 predicting long-term sediment-discharge characteristics of the stream.

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

#### Laboratory Measurements

Sediment samples, samples for biochemical-oxygen (BOD), samples for indicator bacteria, and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the Geological Survey laboratories in Arvada, Colo. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the Geological Survey laboratories are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

#### Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, and water temperature then follow in sequence.

LOCATION.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.--Information on instrumentation is given only if a water-quality monitor temperature record, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.--Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

EXTREMES.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums or minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, WATSTORE, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file to insure the most recent updates.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

#### Remark Codes

The following remark codes may appear with the water-quality data in this report:

PRINTED OUTPUT	REMARK
E	Estimated value
>	Actual value is known to be greater than the value shown
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)
L	Biological organism count less than 0.5 percent (organisms may be observed rather than counted)
D	Biological organism count equal to or greater than 15 percent (dominant)
&	Biological organism estimated as dominant



## DEFINITIONS OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also table for converting English units to International System (SI) Units 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 equal to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Algae are mostly aquatic single-celled, colonial, or multicelled 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, while 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 all the organisms that 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 intestine 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 that 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 also in the intestine 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 KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Bed material is the sediment mixture 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 of 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 grams per cubic meter ( $\text{g}/\text{m}^3$ ), and periphyton and benthic organisms in grams per square meter ( $\text{g}/\text{m}^2$ ).

Dry mass refers to the mass of residue present after drying in an oven at 105 °C for zooplankton and 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 the ash mass and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash and dry mass.

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

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 milliliters (mL) or liters (L).

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 green pigments in plants.

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

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

Control designates a feature downstream from the 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.

Control structure as used in this report is a structure on a stream or canal that is used to regulate the flow or stage of the stream.

Cubic foot per second ( $\text{ft}^3/\text{s}$ )<sup>1</sup> is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Cubic feet per second per square mile [ $(\text{ft}^3/\text{s})/\text{mi}^2$ ]<sup>1</sup> 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.

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 specific period.

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

Dissolved refers to that material in a representative water sample which passes through a 0.45  $\mu\text{m}$  membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

Dissolved-solids concentration of water is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

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 point. 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.H.) 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 computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate ( $\text{CaCO}_3$ ).

<sup>1</sup>Until appropriate changes can be made to the WATSTORE and Prime computer systems, the unit abbreviations "CFS" and "CFSM" will appear in some computer-generated table headings and summaries.

Hydrologic Bench-Mark Network is a network of 57 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

Hydrologic unit is a geographic area representing part of 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 eight-digit number.

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

Micrograms per liter ( $\mu\text{g/L}$ ,  $\mu\text{g/l}$ ) 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 represents the mass of solute per unit volume (liter) of water. Concentrations of suspended sediment also is expressed in  $\text{mg/L}$  and is based on the mass of dry sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf or Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 500 or so sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Organism is any living entity.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per unit area habitat, usually square meter ( $\text{m}^2$ ), acre, or hectare. 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 milliliter (mL) or liter (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.

Parameter Code is a 5-digit number used in the U.S. Geological Survey computerized data system, WATSTORE, to uniquely identify a specific constituent. The codes used in WATSTORE are the same as those used in the U.S. Environmental Protection Agency data system, STORE1. The Environmental Protection Agency assigns and approves all requests for new codes.

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 a particle determined by either 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 the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)	Method of analysis
Clay.....	0.00024 - 0.004	Sedimentation
Silt.....	.004 - .062	Sedimentation
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 matter 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 living upon submerged solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms.

Pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

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 per milliliter (cells/mL) of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algae mats or floating "moss" in lakes. Their concentrations are expressed as number of cells per milliliter (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.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly, green plants). The rate of primary production is estimated by measuring the amount of oxygen release (oxygen method) or the amount of carbon assimilated by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [ $\text{mg C}/\text{m}^2 \cdot \text{time}$ ]] for periphyton and macrophytes and [ $\text{mg C}/(\text{m}^3 \cdot \text{time})$ ] for phytoplankton are units for expressing primary productivity. They define the amount of carbon dioxide consumed as measured by radioactive carbon (carbon 14). The carbon 14 method is of greater sensitivity than the oxygen light and dark bottle method, and is preferred for use in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.



Milligrams of oxygen per area or volume per unit time [mg O/(m<sup>2</sup>.time)] for periphyton and macrophytes and [mg O/m<sup>3</sup>.time)] for phytoplankton are the units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved-oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

Recoverable from bottom material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures are likely to produce different analytical results.

Return period is the average time interval between occurrences of a hydrological event of a given or greater magnitude, usually expressed in years. May also be called recurrence interval.

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.

Bed load is the sediment that is transported in a stream by rolling, sliding, or skipping along the bed and very close to it. In this report, bed load is considered to consist of particles in transit within 0.25 ft of the streambed.

Bed load discharge (tons per day) is the quantity of bed load measured by dry weight that moves past a section as bed load in a given time.

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).

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

Suspended-sediment discharge (tons/day) is the rate at which dry mass of sediment passes a section of a stream or is the quantity of sediment, as measured by dry mass or volume, that passes a section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) x discharge (ft<sup>3</sup>/s) x 0.0027.

Suspended-sediment load is a general term that refers to material in suspension. It is not synonymous with either discharge or concentration.

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 mass or volume, that passes a section during a given time.

Total-sediment load or total load is a term which refers to the total sediment (bed load plus suspended-sediment load) that is in transport. It is not synonymous with total-sediment discharge.

Sodium-adsorption-ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Solute is any substance 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 microsiemens 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 of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in microsiemens). 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 the 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 lives.

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

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 multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton.

Surface area of a lake is that area outlined on the latest U.S. Geological Survey topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimeted. All areas shown are those for the stage when the planimeted map was made.

Surficial bed material is the part (0.1 to 0.2 ft) of the bed material that is sampled using U.S. Series Bed-Material Samplers.

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

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45  $\mu$ m membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45  $\mu$ m membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

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.....	<u>Hexagenia</u>
Species.....	<u>hexagenia limbata</u>

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 of the constituent, in milligrams per liter, by 0.00136.

Tons per day (T/DAY) is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour period.

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determines all of the constituent in the sample.)

Total discharge is the total quantity of any individual constituent, as measured by dry mass or volume, that passes through a stream cross-section per unit of time. This term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses, because different digestion procedures are likely to produce different analytical results.

Water year in Geological Survey reports dealing with surface-water supply is the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1986, is called the "1986 water year."

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports (WRD was used as an abbreviation for "Water-Resources Data" in reports published prior to 1976).

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.

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

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting 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) pertains to 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, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

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- 1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.
- 2-D1. *Application of surface geophysics to ground-water investigations*, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.
- 2-E1. *Application of borehole geophysics to water-resources investigations*, by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.
- 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 pages.
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- 3-A4. *Measurement of peak discharge at width contractions by indirect methods*, by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 pages.
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- 3-A6. *General procedure for gaging streams*, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.
- 3-A7. *Stage measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.
- 3-A8. *Discharge measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.
- 3-A9. *Measurement of time of travel and dispersion in streams by dye tracing*, by E. F. Hubbard, F. A. Kilpatrick, L. A. Martens, and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1982. 44 pages.
- 3-A10. *Discharge ratings at gaging stations*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.
- 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 pages.
- 3-A13. *Computation of continuous records of streamflow*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.
- 3-A14. *Use of flumes in measuring discharge*, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.
- 3-A15. *Computation of water-surface profiles in open channels*, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.
- 3-B1. *Aquifer-test design, observation, and data analysis*, by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.
- 3-B2. *Introduction to ground-water hydraulics, a programmed text for self-instruction*, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.
- 3-B3. *Type curves for selected problems of flow to wells in confined aquifers*, by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.



- 3-C1. *Fluvial sediment concepts* by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.
- 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 pages.
- 3-C3. *Computation of fluvial-sediment discharge* by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.
- 4-A1. *Some statistical tools in hydrology*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.
- 4-A2. *Frequency curves*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.
- 4-B1. *Low-flow investigations*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.
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- 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 pages.
- 5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial sediments*, by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.
- 5-C1. *Laboratory theory and methods for sediment analysis*, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.
- 7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments*, by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.
- 7-C2. *Computer model of two-dimensional solute transport and dispersion in ground water*, by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.
- 7-C3. *A model for simulation of flow in singular and interconnected channels* by R. W. Schaffranek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.
- 8-A1. *Methods of measuring water levels in deep wells*, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.
- 8-A2. *Installation and service manual for U.S. Geological Survey manometers* by J. D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.
- 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 pages.



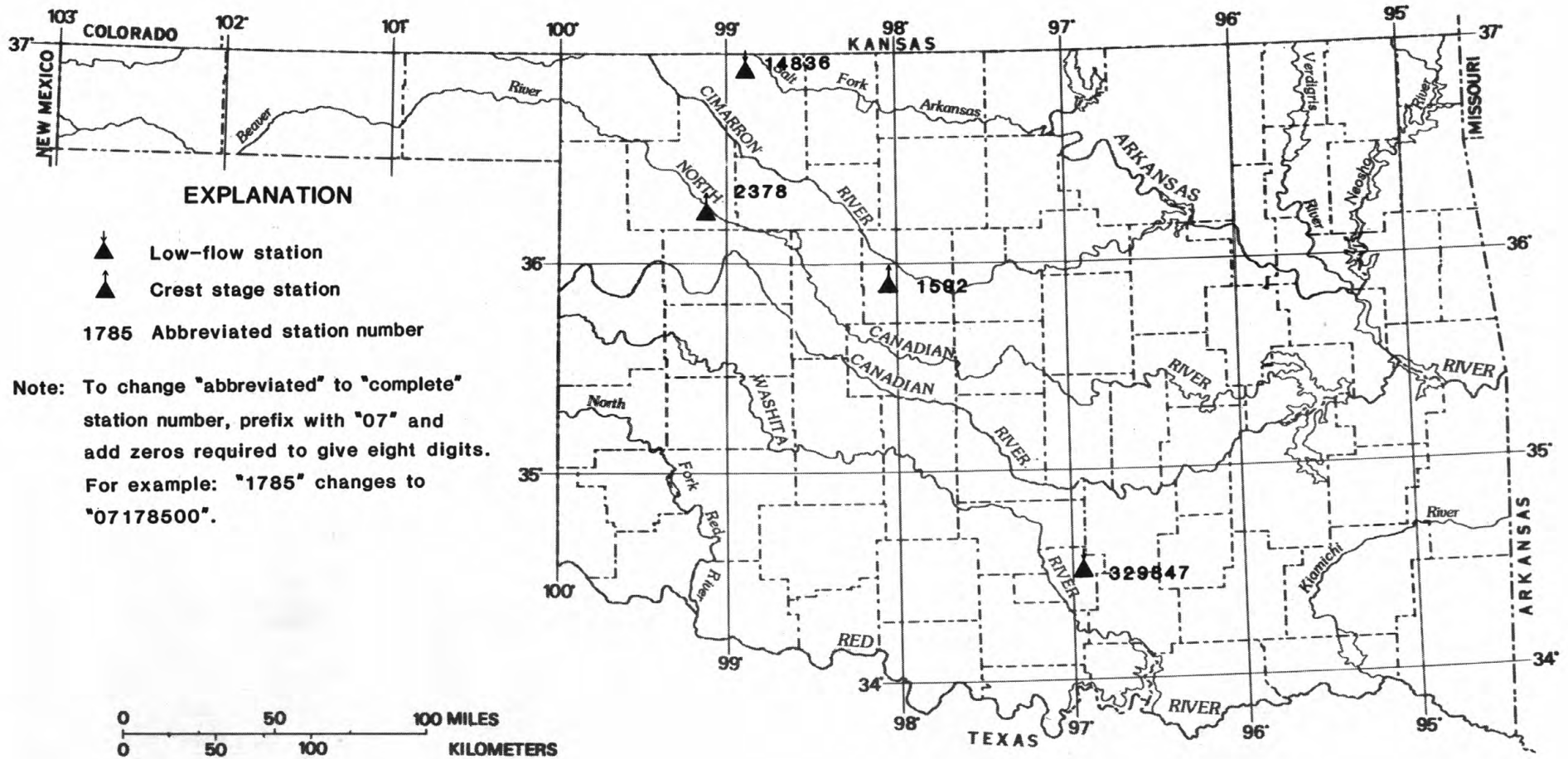


Figure 2.--Location of partial-record stations, water years 1986.

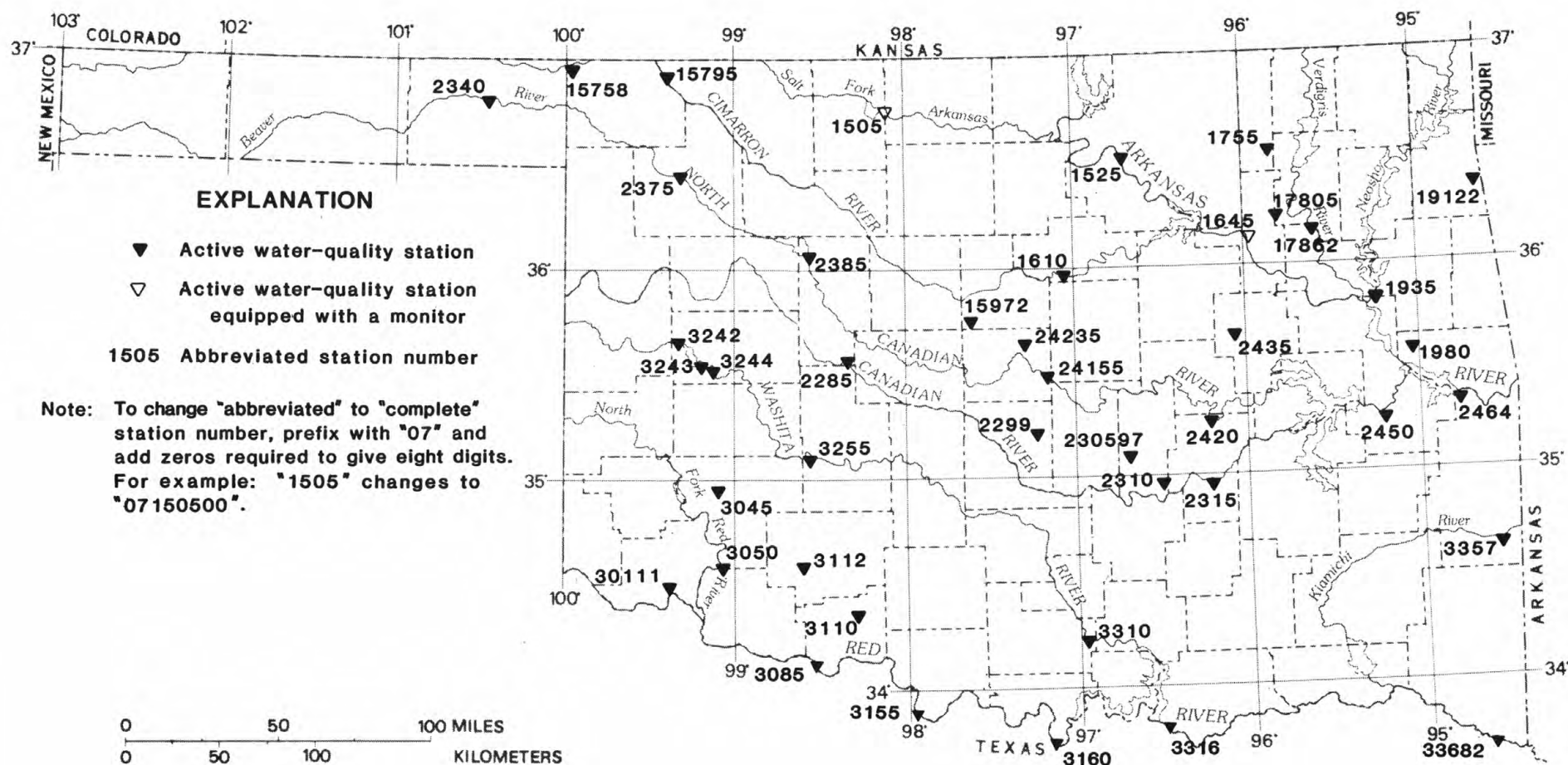


Figure 3.--Location of water-quality stations, water year 1986.





## ARKANSAS RIVER BASIN

23

## 07148130 KAW LAKE NEAR PONCA CITY, OK

LOCATION.--Lat 36°41'58", long 96°55'18", in NW 1/4 SW 1/4 sec.30, T.26 N., R.4 E., Osage County, Hydrologic Unit 11060001, 1,700 ft east of centerline of spillway on dam on Arkansas River, about 8 mi east of Ponca City, and at mile 653.7.

DRAINAGE AREA.--46,530 mi<sup>2</sup>, of which 7,607 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--April 1976 to current year.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929. Prior to July 8, 1976 nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by a rolled, earth dam. Spillway is concrete, gravity ogee-weir type controlled by eight 50-foot taintor gates. Outlet works consist of two sluice gates. Regulated storage began April 22, 1976; conservation pool first filled July 6, 1976. Capacity, 1,348,000 acre-ft, at elevation 1,044.5 ft, top of flood control pool, 428,600 acre-ft, at elevation 1,010.0 ft, top of conservation pool, and 250,700 acre-ft, at elevation 997.5 ft, crest of controlled spillway. Dead storage 85,100 acre-ft below elevation 978.0 ft. Figures given herein represent total contents. Reservoir is designed for flood control, water-quality control, recreation, fish and wildlife, and water supply.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 799,200 acre-ft, June 6, 1982, elevation, 1,027.27 ft; minimum since conservation pool first filled, 223,100 acre-ft, Mar. 25, 1977, elevation, 995.06 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 747,200 acre-ft, Oct. 19, elevation, 1,025.24 ft; minimum, 367,800 acre-ft, Mar. 25, elevation, 1,006.23 ft.

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

1,006	364,300	1,020	624,000
1,012	463,700	1,025	741,200
1,016	539,800	1,030	873,000

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	421200	491400	651400	465200	374000	372500	373800	427800	481600	472900	411100	415200
2	420100	491000	646200	461600	373800	374200	378300	427600	482400	468500	409700	410300
3	420000	490800	643900	459300	373200	374800	390100	426900	486300	467200	409400	408100
4	419200	489900	640100	455700	373800	374200	400400	425600	486700	468600	408500	406100
5	417700	488200	632100	450900	375900	373700	402500	425900	502200	468300	410500	405800
6	415700	486900	621800	446300	376000	372900	403800	431500	509600	468100	409400	406600
7	413800	484600	611800	435900	375100	372900	405400	449800	518600	470500	408500	404300
8	418500	482600	603100	426800	373200	370800	405900	448200	522200	484200	408100	403200
9	420900	481800	593500	418200	370800	370500	405900	458700	522000	492100	409800	403700
10	420000	479600	585600	409400	369700	370500	408100	466600	529900	488200	411300	404000
11	461900	476700	574500	401500	370500	370000	410500	478900	539000	481500	411600	405000
12	557300	475800	566500	393400	370600	370200	413100	489700	539600	480200	410500	405300
13	675400	476100	554400	385500	371100	369700	416000	481600	531300	493800	407200	405800
14	734300	481600	543700	378500	370600	369800	417700	468300	520000	521200	403500	407200
15	744500	550800	533500	372500	370300	370300	420000	467900	507100	514600	402300	410300
16	742500	604800	525700	371700	370800	370900	421500	469900	499600	492800	408100	416700
17	730200	641200	521000	371200	370600	370800	421900	490000	497900	469400	416800	420000
18	745500	656200	514200	371100	370900	372300	424600	524600	497500	452000	420500	421900
19	738300	666800	508200	369700	371100	372300	425100	546300	497500	441200	415700	424400
20	718400	672100	503000	368900	372000	371400	425900	552000	495800	428800	405300	426400
21	697500	673700	498600	370200	371700	371100	425400	547700	494900	416800	401200	428900
22	675400	671900	494700	369500	371400	371200	425200	540600	493400	407200	402000	431500
23	655800	668600	491500	369700	371200	370800	424400	531100	494900	403800	402800	434000
24	634100	662400	490600	372000	370800	369800	425600	520000	495500	404000	403300	435200
25	610000	657600	487600	373400	370900	369700	425400	509000	495300	405800	404500	427800
26	584900	660100	485200	374800	371700	370200	425600	496200	494500	405400	405300	418700
27	559300	658800	482000	374800	370800	370200	427100	486900	491200	404300	404600	417800
28	536600	656700	479100	375500	370900	370800	427100	482700	486100	405000	404300	418000
29	517500	655600	476000	374800	---	371400	427100	483100	481100	407100	413300	448700
30	499600	654900	473000	374800	---	371500	428400	483300	476100	408700	416200	570700
31	491200	---	469200	374300	---	373400	---	482600	---	409800	416300	---
MAX	745500	673700	651400	465200	376000	374800	428400	552000	539600	521200	420500	570700
MIN	413800	475800	469200	368900	369700	369700	373800	425600	476100	403800	401200	403200
(†)	1013.49	1021.37	1012.30	1006.65	1006.43	1006.59	1009.99	1013.03	1012.68	1008.88	1009.27	1017.51
(††)	+70,200	+163,700	-185,700	-94,900	-3,400	+2,500	+65,000	+44,200	-6,500	-66,300	+6,500	+154,400
CAL YR 1985	MAX	745500	MIN	385200	(††)	+5,000						
WTR YR 1986	MAX	745500	MIN	368900	(††)	+149,700						

(†) ELEVATION, IN FEET, AT END OF MONTH

(††) CHANGE IN CONTENTS, IN ACRE-FEET

## ARKANSAS RIVER BASIN

07148140 ARKANSAS RIVER NEAR PONCA CITY, OK

LOCATION.--Lat 36°41'55", long 96°55'40", in SW 1/4 SE 1/4 sec.25, T.26 N., R.3 E., Kay County, Hydrologic Unit 11060001, at spillway of Kaw Dam, about 8 mi east of Ponca City, and at mile 653.7.

DRAINAGE AREA.--46,530 mi<sup>2</sup>, of which 7,607 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--April 1976 to current year.

GAGE.--Nonrecording gage. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

AVERAGE DISCHARGE.--(Since regulation by Kaw Dam) 10 years 2,882 ft<sup>3</sup>/s, 2,088,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,500 ft<sup>3</sup>/s, Mar. 30, 1984; no flow May 13, 1979, and Sept. 14-24, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 22,000 ft<sup>3</sup>/s, Oct. 16, 17, 20, 21; no flow Sept. 14-24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4980	3380	3500	4000	1650	600	2130	1460	3000	3800	850	2190
2	6850	3000	3500	4000	1650	600	3500	1650	3000	3800	842	3510
3	5880	3000	2480	3060	1650	1030	3500	1650	3000	3070	840	2690
4	4690	3000	3720	4000	1380	1580	3500	1650	3000	2100	840	2180
5	3950	3000	6520	4000	1220	1700	3500	1650	3000	2100	840	1840
6	3950	3000	7750	5400	2480	1630	3500	3390	3000	2100	1520	1380
7	2540	3000	7650	6400	3050	1620	2830	6860	3000	2690	1900	1380
8	1370	2840	7600	6400	3050	1620	2200	8450	3000	5080	1900	1380
9	1120	3250	7550	6400	3050	1620	2200	8450	3000	7650	1900	973
10	5010	3250	7450	6300	2260	1620	1600	8450	3000	8850	1900	674
11	1220	3250	7400	6100	1700	1490	1200	8300	5620	8770	2220	660
12	17800	3250	7400	5900	1700	1400	1200	9790	9000	8670	2500	660
13	19800	4170	7400	5800	1700	1400	1200	12000	9000	5420	2910	619
14	21300	4750	7400	5750	1700	1310	1200	12000	9000	7360	3080	.00
15	12000	5100	7400	4450	1700	1160	1200	10900	9000	13100	1860	.00
16	22000	5100	6780	2070	1700	1160	1200	7880	6730	15100	1100	.00
17	22000	5630	6000	2000	1700	1160	1200	6100	3160	15000	1100	.00
18	20100	4370	6000	2000	1700	1280	1200	6100	2000	11800	2650	.00
19	20400	3120	5750	2000	1700	1400	1200	6100	2000	8200	5100	.00
20	22000	4350	4690	2000	1700	1400	1200	8410	2000	8200	6560	.00
21	22000	5000	4000	1500	1700	1400	1200	10000	2000	8200	3540	.00
22	21200	6150	4000	1500	1700	1400	1200	10000	2000	6810	1100	.00
23	21000	6830	4000	950	1700	1400	1200	10000	2000	4470	1100	.00
24	20500	7200	4000	1000	1700	1400	1070	10000	2000	1510	1100	.00
25	19800	5980	4000	1000	1700	1290	1050	10000	2000	1560	1380	4810
26	19400	3310	4000	1000	1700	1200	1200	10000	2000	1600	1640	6040
27	19000	3500	4000	1070	1520	961	1200	8760	3030	1600	1640	1650
28	16700	3500	4000	1310	1030	800	1180	5640	3800	1040	1640	1650
29	14700	3500	4000	1650	---	800	1200	3000	3800	140	1800	1360
30	13500	3500	4000	1340	---	800	1200	3000	3800	261	2190	275
31	8090	---	4000	1650	---	800	---	3000	---	659	2190	---
TOTAL	414850	122280	167940	102000	51190	39031	52160	214640	113940	170710	61732	35921.00
MEAN	13380	4076	5417	3290	1828	1259	1739	6924	3798	5507	1991	1197
MAX	22000	7200	7750	6400	3050	1700	3500	12000	9000	15100	6560	6040
MIN	1120	2840	2480	950	1030	600	1050	1460	2000	140	840	.00
AC-FT	822900	242500	333100	202300	101500	77420	103500	425700	226000	338600	122400	71250
CAL YR 1985	TOTAL	1716293		MEAN	4702	MAX	22000	MIN	120	AC-FT	3404000	
WTR YR 1986	TOTAL	1546394		MEAN	4237	MAX	22000	MIN	.00	AC-FT	3067000	

## ARKANSAS RIVER BASIN

25

## 07148350 SALT FORK ARKANSAS RIVER NEAR WINCHESTER, OK

LOCATION.--Lat 36°57'45", long 98°46'55", in NE 1/4 SE 1/4 sec.26, T.29 N., R.15 W., Woods County, Hydrologic Unit 11060002, near left bank on downstream side of pier of county road bridge, 1 mi northeast of Winchester, 2.5 mi upstream from Greenwood Creek, 4.9 mi downstream from Yellowstone Creek, 5 mi downstream from State line, 19 mi northwest of Alva, and at mile 156.2.

DRAINAGE AREA.--856 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1959 to current year. Monthly discharge only for some periods, published in WSP 1731.

REVISED RECORDS.--WSP 1731: Drainage area. WSP 1921: 1960.

GAGE.--Water-stage recorder. Datum of gage is 1,410.05 ft National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 1-5, 11-16, Jan. 8, 9, and Feb. 11-14. Records good except for periods of estimated record, which were effected by ice, which are poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--27 years, 90.1 ft<sup>3</sup>/s, 65,280 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 52,000 ft<sup>3</sup>/s, Aug. 19, 1961, gage height, 13.95 ft, from rating curve extended above 17,400 ft<sup>3</sup>/s; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1957 reached a stage of 15.4 ft, from information by county engineer, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft<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. 10	1030	*11,900	*12.83	No other peaks greater than base discharge.			

Minimum daily discharge, 0.37 ft<sup>3</sup>/s, July 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	113	74	85	78	62	90	159	63	104	1.3	109
2	43	105	61	83	74	61	71	137	1220	95	18	101
3	39	104	50	78	75	63	66	117	2430	89	6.2	104
4	34	100	45	73	80	63	60	104	1260	75	.93	132
5	27	97	60	70	80	66	53	94	554	64	127	115
6	25	93	184	76	78	64	51	85	394	56	55	90
7	23	82	162	69	74	61	48	76	988	53	23	71
8	24	78	137	60	73	61	45	74	818	53	10	63
9	150	75	110	50	71	62	45	79	366	47	8.1	58
10	7990	70	97	88	67	58	45	87	309	39	15	52
11	2080	75	90	99	52	56	45	87	327	40	5.3	50
12	861	80	70	85	45	69	48	66	156	38	8.0	54
13	553	83	60	80	35	76	47	57	103	31	3.1	40
14	407	173	45	79	41	72	42	53	81	22	452	33
15	336	251	39	80	103	68	38	52	74	18	972	36
16	296	171	54	83	99	64	37	55	67	14	456	54
17	264	139	110	83	102	66	39	284	60	9.7	239	108
18	257	126	109	84	91	65	41	242	54	6.4	162	79
19	242	110	96	84	85	63	39	139	48	4.1	122	42
20	220	97	93	84	76	60	39	108	42	19	98	27
21	198	96	89	82	71	60	38	86	331	19	85	21
22	174	96	89	73	71	60	37	73	437	12	79	19
23	170	94	86	71	74	59	37	64	504	6.6	165	20
24	167	90	85	72	76	57	34	60	214	4.0	133	685
25	160	91	80	71	73	56	31	53	139	2.2	97	636
26	157	95	82	69	69	57	34	51	133	29	73	226
27	155	87	86	68	63	54	920	104	127	12	980	129
28	148	88	86	73	60	52	778	133	123	4.3	538	97
29	137	90	87	80	---	50	302	109	114	1.5	248	145
30	128	82	89	81	---	49	202	92	104	.59	161	664
31	122	---	91	80	---	49	---	76	---	.37	125	---
TOTAL	15636	3131	2696	2393	2036	1883	3402	3056	11640	968.76	5465.93	4060
MEAN	504	104	87.0	77.2	72.7	60.7	113	98.6	388	31.3	176	135
MAX	7990	251	184	99	103	76	920	284	2430	104	980	685
MIN	23	70	39	50	35	49	31	51	42	.37	.93	19
AC-FT	31010	6210	5350	4750	4040	3730	6750	6060	23090	1920	10840	8050
CAL YR 1985	TOTAL	73437.00		MEAN	201	MAX	7990	MIN	.13	AC-FT	145700	
WTR YR 1986	TOTAL	56367.69		MEAN	154	MAX	7990	MIN	.37	AC-FT	111800	



## 07148400 SALT FORK ARKANSAS RIVER NEAR ALVA, OK

LOCATION.--Lat 36°48'45", long 98°38'50", in SW 1/4 SW 1/4 sec.18, T.27 N., R.13 W., Woods County, Hydrologic Unit 11060002, at bridge on U.S. Highway 281, 1.0 mi northeast of Alva, 19 mi upstream from Medicine Lodge River, and at mile 126.0.

DRAINAGE AREA.--1,009 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1904 to December 1905 (gage heights only), October 1937 to September 1951, monthly discharge only for some periods, published in WSP 1311, October 1979 to current year. Occasional low flow measurements water years 1952-54, 1977-79.

GAGE.--Water stage recorder. Datum of gage is 1,292.04 ft, National Geodetic Vertical Datum of 1929.

April 1904 to December 1905, chain gage at site 0.8 mi upstream at different datum, and February 1938 to September 1951, water stage recorder at present site and at datum 5.00 ft higher.

REMARKS.--Estimated daily discharges: Nov. 30 to Dec. 4, Dec. 6 to Jan. 26, 28-30, Feb. 11-15, and Mar. 21-31. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--14 years (water years 1938-51), 109 ft<sup>3</sup>/s, 78,970 acre-ft/yr; 7 years (water years 1980-86), 117 ft<sup>3</sup>/s, 84,770 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,000 ft<sup>3</sup>/s, Oct. 23, 1941, from rating curve extended above 13,000 ft<sup>3</sup>/s. Maximum gage height, 15.24 ft, Oct. 10, 1985; no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,000 ft<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. 10	2000	*12,800	*15.24	No other peaks greater than base discharge.			
Minimum daily discharge, 2.5 ft <sup>3</sup> /s, July 31.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	144	42	102	70	70	89	153	65	96	10	113
2	50	138	47	100	74	70	115	123	275	85	15	108
3	47	129	58	94	77	89	87	103	1690	80	14	110
4	41	124	65	88	86	90	83	88	1060	74	6.7	121
5	35	118	104	84	84	86	79	83	587	67	17	109
6	30	114	166	91	82	77	80	76	420	61	97	93
7	27	108	170	83	73	77	81	68	564	60	42	78
8	29	103	152	72	74	73	75	65	787	53	24	72
9	73	99	130	60	75	78	69	78	408	50	108	69
10	7090	98	116	106	76	78	66	88	477	46	117	64
11	4600	99	108	119	66	75	65	106	353	41	30	62
12	1170	107	89	102	52	84	65	74	262	42	23	64
13	797	115	72	96	42	90	66	56	203	40	18	59
14	641	188	54	95	49	90	62	52	171	37	410	55
15	509	401	47	96	89	87	57	45	160	27	734	54
16	430	236	65	100	104	86	57	49	139	22	498	55
17	378	195	132	99	105	84	57	208	120	16	253	65
18	349	172	131	101	94	80	58	231	113	13	178	93
19	321	157	115	101	91	78	57	142	109	11	135	66
20	295	145	112	100	84	75	54	104	93	17	110	50
21	272	136	107	98	73	75	52	86	150	33	93	43
22	256	135	107	88	70	74	47	73	350	24	83	41
23	241	137	103	85	74	74	45	66	340	28	92	36
24	227	133	102	86	80	72	43	59	298	13	133	118
25	213	133	96	85	83	71	44	56	202	7.4	105	539
26	198	135	98	83	80	72	43	54	149	9.1	86	248
27	188	129	103	82	77	67	129	86	130	21	310	152
28	178	119	103	84	72	64	759	106	112	11	502	113
29	168	115	104	86	---	62	315	105	96	5.1	267	154
30	159	90	107	84	---	61	202	90	90	2.9	169	363
31	150	---	109	79	---	61	---	74	---	2.5	133	---
TOTAL	19214	4252	3114	2829	2156	2370	3101	2847	9973	1095.0	4812.7	3367
MEAN	620	142	100	91.3	77.0	76.5	103	91.8	332	35.3	155	112
MAX	7090	401	170	119	105	90	759	231	1690	96	734	539
MIN	27	90	42	60	42	61	43	45	65	2.5	6.7	36
AC-FT	38110	8430	6180	5610	4280	4700	6150	5650	19780	2170	9550	6680

CAL YR 1985 TOTAL 77745.2 MEAN 213 MAX 7090 MIN 3.1 AC-FT 154200  
WTR YR 1986 TOTAL 59130.7 MEAN 162 MAX 7090 MIN 2.5 AC-FT 117300

## ARKANSAS RIVER BASIN

27

## 07150000 GREAT SALT PLAINS LAKE NEAR JET, OK

LOCATION.--Lat 36°44'40", long 98°08'08", in NW 1/4 SE 1/4 sec.11, T.26 N., R.9 W., Alfalfa County, Hydrologic Unit 11060004, at right end of Great Salt Plains Dam on Salt Fork Arkansas River, 4.5 mi upstream from Wagon Creek, 5.5 mi northeast of Jet, and at mile 103.3.

DRAINAGE AREA.--3,200 mi<sup>2</sup>, of which 8 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--July 1941 to current year. Prior to October 1970, published as Great Salt Plains Reservoir near Jet.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth dam. Outlet works consist of a 310-foot uncontrolled concrete spillway containing a series of three weirs to form a cascade. Storage began in June 1941; conservation pool was first filled Oct. 21, 1941. Capacity, 257,700 acre-ft at elevation 1,138.5 ft, crest of upper weir, and 31,420 acre-ft at elevation 1,125.0 ft, crest of intermediate weir and conservation pool. Reservoir is used for flood control and as a wildlife refuge. Figures given herein represent total contents. Revised capacity table, based on survey in 1971, used since Oct. 1, 1972.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 189,400 acre-ft, July 2, 1951, elevation, 1,134.38 ft; minimum, 17,180 acre-ft, Sept. 6, 1973, elevation, 1,123.16 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 91,260 acre-ft, Oct. 14, elevation 1,130.06 ft; minimum, 25,290 acre-ft, Aug. 1, elevation 1,124.26 ft.

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

1,123	16,080	1,128	62,940
1,124	23,280	1,129	75,970
1,126	40,070	1,130	90,350

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39590	38750	37360	36250	35040	34950	33460	34480	35130	39490	32810	36060
2	38750	38470	36800	36250	35040	34760	33930	34670	35320	39310	31790	35690
3	37820	38290	36520	36150	35040	34760	34200	34670	39030	39120	31610	35410
4	37170	37730	36430	36150	35220	34850	35130	34580	42380	38380	31180	34950
5	36430	37640	36430	36250	34950	34670	34580	34300	47620	37360	31790	35040
6	35780	37270	36430	35220	35040	34760	34670	34110	49920	37080	31610	34480
7	35970	37270	36430	35130	34950	33550	34580	33090	51770	36990	31510	34580
8	34580	37360	36710	35320	35130	34390	33550	33370	50970	36520	31790	34390
9	35690	36620	36900	35320	34950	35220	34110	33550	50970	35870	32440	33740
10	41330	36430	37080	35320	35130	33930	34200	34670	52240	35320	31880	34020
11	52940	36430	37170	35320	35220	33280	34200	34670	49190	34670	31790	33740
12	83880	36430	37080	35410	35220	34850	34110	34760	48040	34020	31700	33460
13	90670	36430	36800	35600	35040	34580	34580	34300	46670	33830	31180	33280
14	90510	38100	36620	35600	35040	34580	35040	35500	45000	34300	38750	33090
15	86760	40800	36430	35600	35040	34390	34020	35600	43110	33650	39680	33000
16	81430	42590	36340	35690	35320	34760	33460	36250	43110	33090	40700	33180
17	74800	43840	36340	35600	35320	35040	32630	38470	42690	32630	41330	33280
18	69320	44260	36340	35690	35500	35970	33740	38660	42270	32440	40510	33000
19	63980	43420	36430	35600	35410	34950	33650	38940	41540	31700	39030	32720
20	59290	41960	36430	35600	35320	34850	33830	38290	40420	31180	38290	32530
21	55300	40910	36430	35690	35410	34850	33550	37450	39770	31420	37360	32530
22	51890	40330	36520	35410	35410	35040	33180	36990	41010	31420	36710	32720
23	49400	39860	36710	35040	35410	34670	33460	36710	43110	31180	36620	32160
24	46880	39310	36710	35130	35410	34670	33460	36340	43950	31980	35690	32070
25	45210	39030	36620	35220	35410	34580	33280	36060	43840	31180	35780	31880
26	43630	38470	36430	35040	35220	33740	32440	36250	42900	31010	35130	33000
27	42380	38470	36250	34950	34850	34110	34670	36150	41640	31510	34390	32720
28	41120	38010	36250	34950	34950	34580	32810	36150	40330	31180	35220	32900
29	40330	37540	36250	34760	---	34390	34480	35870	39400	31090	35970	41540
30	39590	37450	36250	35220	---	33740	33830	35690	38380	31090	36060	49820
31	39400	---	36250	35220	---	34110	---	35410	---	29950	36150	---
MAX	90670	44260	37360	36250	35500	35970	35130	38940	52240	39490	41330	49820
MIN	34580	36430	36250	34760	34850	33280	32440	33090	35130	29950	31180	31880
(+)	1125.86	1125.65	1125.52	1125.41	1125.38	1125.29	1125.26	1125.43	1125.75	1124.82	1125.51	1126.86
(++)	-1,300	-1,950	-1,200	-1,030	-270	-840	-280	+1,580	+2,970	-8,430	+6,200	+13,670
CAL YR 1985 MAX	90670	MIN	29060	(++)	+150							
WTR YR 1986 MAX	90670	MIN	29950	(++)	+9,120							

(+) ELEVATION, IN FEET, AT END OF MONTH  
(++) CHANGE IN CONTENTS, IN ACRE-Feet

## ARKANSAS RIVER BASIN

07150500 SALT FORK ARKANSAS RIVER NEAR JET, OK

LOCATION.--Lat 36°45'11", long 98°07'44", in NE 1/4 NE 1/4 sec.11, T.26 N., R.9 W., Alfalfa County, Hydrologic Unit 11060004, near center of span on downstream side of county road bridge, 0.6 mi downstream from Great Salt Plains Dam, 4 mi upstream from Wagon Creek, 6 mi northeast of Jet, and at mile 102.7.

DRAINAGE AREA.--3,202 mi<sup>2</sup>, of which 8 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1937 to current year.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,092.20 ft, National Geodetic Vertical Datum of 1929 (levels by U.S Army Corps of Engineers). Prior to Mar. 17, 1938, nonrecording gage at site 2.5 mi upstream at datum 13.46 ft higher. Mar. 17, 1938 to Apr. 26, 1953, water-stage recorder at site 200 ft upstream, datum 5.00 ft higher prior to Oct. 1, 1950.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since June 1941 by Great Salt Plains Lake (station 07150000).

AVERAGE DISCHARGE.--(Since regulation by Great Salt Plains Dam) 45 years (water years 1942-86), 378 ft<sup>3</sup>/s, 273,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 25,900 ft<sup>3</sup>/s, May 19, 1938, gage height, 13.80 ft, present datum; no flow at times in 1939-41, 1944, and 1955-56.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,840 ft<sup>3</sup>/s, Oct. 13, gage height, 8.80 ft; minimum daily discharge, 3.9 ft<sup>3</sup>/s, July 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	818	785	637	428	286	273	137	202	308	952	46	415
2	729	737	627	426	294	260	181	257	327	928	52	388
3	625	693	627	401	297	270	200	270	649	913	39	366
4	516	636	564	416	322	271	300	261	1120	845	48	340
5	425	616	433	429	291	252	231	248	1730	691	62	311
6	365	551	447	332	293	264	242	213	2140	584	60	269
7	364	570	482	299	284	156	259	156	2330	585	54	223
8	263	569	512	340	312	230	137	140	2270	536	57	245
9	264	490	537	317	278	380	202	150	2280	476	74	307
10	789	431	562	313	315	256	211	217	2360	393	60	241
11	1900	418	557	321	329	123	213	255	2100	327	48	210
12	4630	432	524	344	304	250	207	255	1930	268	55	168
13	5720	448	490	352	281	238	220	216	1780	179	60	145
14	5740	540	451	357	285	233	304	242	1600	262	460	131
15	5410	999	424	343	292	222	186	348	1370	191	871	130
16	4940	1210	426	369	330	264	127	387	1330	147	1020	107
17	4450	1370	441	346	337	280	83	669	1290	103	1120	173
18	4020	1420	467	362	344	366	169	723	1260	86	1080	146
19	3560	1310	475	340	330	286	140	757	1180	52	922	136
20	3120	1170	476	356	325	254	178	705	1090	33	813	114
21	2760	1040	473	382	318	258	146	621	999	27	696	100
22	2440	976	488	322	333	285	108	548	1070	30	590	103
23	2130	900	491	303	318	235	151	514	1260	36	500	93
24	1830	834	477	304	320	255	156	444	1450	66	445	108
25	1600	783	455	322	319	264	140	405	1450	22	440	71
26	1430	719	431	309	315	158	104	388	1350	25	381	97
27	1270	687	417	280	299	197	299	394	1240	45	247	98
28	1140	638	429	297	269	239	102	401	1110	21	261	129
29	1020	584	433	268	---	248	185	380	991	17	386	385
30	920	564	432	310	---	166	230	359	849	24	429	1640
31	889	---	426	326	---	189	---	333	---	3.9	405	---
TOTAL	66077	23120	15111	10614	8620	7622	5548	11458	42213	8867.9	11781	7389
MEAN	2132	771	487	342	308	246	185	370	1407	286	380	246
MAX	5740	1420	637	429	344	380	304	757	2360	952	1120	1640
MIN	263	418	417	268	269	123	83	140	308	3.9	39	71
AC-FT	131100	45860	29970	21050	17100	15120	11000	22730	83730	17590	23370	14660
CAL YR 1985	TOTAL	238021.1		MEAN	652	MAX	5740	MIN	4.8	AC-FT	472100	
WTR YR 1986	TOTAL	218420.9		MEAN	598	MAX	5740	MIN	3.9	AC-FT	433200	

07150500 SALT FORK ARKANSAS RIVER NEAR JET, OK--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951-63, 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1954 to September 1959, October 1961 to September 1963, July 1968 to current year.

WATER TEMPERATURE: October 1954 to September 1959, October 1961 to September 1963, July 1968 to current year.

CHLORIDES: October 1955 to September 1959.

INTRUMENTATION.--Water quality monitor since July 1968.

REMARKS.--In addition to water quality monitor, samples were collected by a local observer on a daily basis.

Samples were collected quarterly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 57,000 microsiemens, Jan. 28, 1977; minimum daily, 1,280 microsiemens, Nov. 4, 1980.

WATER TEMPERATURE: Maximum daily, 36.0 °C, Aug. 11, 1980, Aug. 22, 1986; minimum daily, 0.0 °C on many days during winter period.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 9,600 microsiemens, Aug. 1; minimum daily, 1,780 microsiemens, July 4.

WATER TEMPERATURE: Maximum daily, 36.0 °C, Aug. 22; minimum daily, 0.0 °C, Dec. 1.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)
OCT										
13...	1735	1028	1028	8.77	5760	3400	7.50	22.0	13.5	--
NOV										
08...	1330	1028	80020	4.60	698	2730	8.60	20.0	12.5	722
25...	1620	1028	1028	4.68	783	3600	--	4.0	4.0	--
JAN										
06...	1759	1028	1028	4.10	306	4320	8.20	--	2.5	--
MAR										
11...	1430	1028	80020	4.73	140	4310	8.20	14.5	13.0	719
APR										
23...	1730	1028	80020	3.82	166	6200	8.10	24.0	18.5	727
JUN										
10...	1856	1028	1028	6.07	2440	2840	8.00	28.0	27.5	--
AUG										
07...	1900	1028	80020	3.43	56	7200	8.60	32.5	30.0	730

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB W/ WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM
OCT									
13...	--	--	--	--	--	--	--	--	--
NOV									
08...	10.2	102	49	670	470	190	47	390	56
25...	--	--	--	--	--	--	--	--	--
JAN									
06...	--	--	--	--	--	--	--	--	--
MAR									
11...	9.7	99	42	690	530	170	64	640	67
APR									
23...	7.8	89	43	780	650	180	80	1000	73
JUN									
10...	--	--	--	--	--	--	--	--	--
AUG									
07...	10.0	142	72	560	440	150	45	1300	83



## ARKANSAS RIVER BASIN

07150500 SALT FORK ARKANSAS RIVER NEAR JET, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
OCT 13...	--	--	--	--	--	--	--	--	--
NOV 08...	7	4.9	222	9.0	197	0.9	420	600	1700
25...	--	--	--	--	--	--	--	--	--
JAN 06...	--	--	--	--	--	--	--	--	--
MAR 11...	11	4.6	193	0	158	1.9	640	1000	2630
APR 23...	16	5.2	159	0	130	2.0	700	1600	3740
JUN 10...	--	--	--	--	--	--	--	--	--
AUG 07...	25	7.4	122	13	122	0.5	520	2100	3900

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5930	3300	3610	3830	3550	4210	5200	5210	6050	3310	9600	5310
2	5780	3310	3580	3730	3890	4400	---	6720	6520	2980	5980	5290
3	5210	3200	3620	3810	3750	4240	5370	6020	6870	3000	5980	5260
4	5370	2950	3610	3780	3840	4060	5360	5970	6580	1780	6110	5170
5	5810	3010	3600	3860	3860	4040	4870	6450	6910	4390	5960	5180
6	5820	3040	3610	3880	3820	4020	5160	6330	6100	4000	6100	5030
7	5700	3070	3620	3820	3810	4160	5150	6790	6070	3150	6880	5290
8	5690	2950	3590	4010	3980	4150	5410	5880	5520	4170	6900	5280
9	5450	3700	3580	4070	3740	3370	5420	6250	4770	4740	7030	5140
10	5380	3690	3760	4090	3780	4120	5760	6400	2950	4750	7100	4360
11	5550	3350	3680	4080	3900	4270	5580	6260	3950	4590	7250	4670
12	3170	3470	3670	4050	3890	4320	5620	6230	3940	4920	7750	4760
13	3120	3430	3670	3600	3850	4330	5730	6280	4130	4910	7530	4890
14	2150	3440	3700	3810	3870	4320	5800	7590	3270	4840	6070	4850
15	1790	3600	3770	3800	4160	4310	5950	8020	3320	5320	6380	4870
16	1860	2450	3790	3940	4330	4590	6080	7990	3250	5240	6500	5080
17	1930	3150	3770	3870	4200	4680	7600	7690	3450	5220	6670	4940
18	2030	3040	3750	3780	4190	4460	7280	8030	3530	5180	6980	4910
19	2070	3140	3770	3750	4250	4960	6520	8020	3510	5520	7090	5210
20	2350	3320	3780	3960	4230	4970	6440	7550	2930	6310	6920	5260
21	2230	4130	3900	3790	4500	4940	6490	7540	2820	5980	6580	5260
22	2450	4010	3960	3880	4520	4860	6160	7160	3130	5720	6460	5160
23	2840	3960	3930	3890	4500	4750	6140	6580	3810	5890	6330	4790
24	3220	3640	3890	3820	4450	4760	6040	6260	4340	6620	6030	5240
25	3230	3620	3880	3810	4460	4690	5910	6530	4200	6640	6030	5520
26	3190	3910	3870	3830	4090	4790	6370	6600	2050	6660	3730	5520
27	3030	3910	3890	3920	4150	5040	6450	6720	2150	5710	5020	4700
28	3070	3570	3980	3920	4270	4440	6500	6660	2910	6300	5480	4360
29	3150	3560	4000	3830	---	4430	5000	6440	3270	6480	5390	4280
30	3030	3530	3940	4140	---	4800	4980	6060	3180	8460	5480	4780
31	3110	---	3880	3960	---	5060	---	6140	---	8510	5560	---
MEAN	3700	3420	3760	3880	4070	4470	5870	6720	4180	5200	6420	5010
WTR YR 1986	MEAN	4730		MAX	9600		MIN	1780				

## ARKANSAS RIVER BASIN

31

07150500 SALT FORK ARKANSAS RIVER NEAR JET, OK--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.0	13.5	.0	5.5	9.5	10.0	19.0	22.0	24.0	29.0	33.0	22.0
2	14.5	11.5	.5	3.5	10.0	11.0	---	21.0	24.5	30.0	34.0	21.0
3	15.0	13.0	2.0	4.5	10.5	12.0	18.0	20.0	25.0	30.0	34.0	25.0
4	15.0	13.0	3.0	3.0	12.0	12.5	18.0	21.0	26.0	28.0	34.0	26.0
5	15.0	14.5	4.0	3.0	10.5	13.0	17.5	24.5	25.0	28.0	35.0	25.0
6	15.5	12.5	4.0	3.0	7.0	14.0	22.0	25.0	27.0	28.5	34.0	26.0
7	16.0	12.0	4.5	1.0	6.0	12.0	23.0	23.0	27.0	28.0	34.5	21.0
8	17.5	7.0	4.5	2.0	5.0	11.0	19.5	24.0	27.0	29.0	34.5	21.0
9	13.0	8.0	4.0	3.0	3.0	15.0	19.0	22.0	28.5	30.0	35.0	23.0
10	13.5	8.0	2.5	4.0	2.0	14.0	18.0	24.0	28.0	29.0	34.0	24.0
11	13.0	7.5	2.0	5.0	2.0	13.0	18.0	24.0	26.0	33.0	30.5	23.0
12	14.0	14.0	2.5	5.5	1.5	13.0	19.5	26.0	25.5	33.0	33.0	24.0
13	14.5	8.5	2.0	5.5	1.0	12.0	20.5	26.0	27.0	34.0	34.0	23.0
14	13.5	8.0	3.0	6.0	2.0	13.5	15.5	22.0	26.0	33.0	34.5	24.0
15	16.0	7.0	2.0	6.0	3.0	12.0	15.0	26.0	28.0	33.5	34.5	24.5
16	16.0	7.5	3.0	8.0	7.0	13.0	17.0	24.5	28.0	34.0	35.0	25.0
17	16.0	10.0	4.0	8.0	8.5	14.5	16.0	20.0	28.0	34.0	35.0	25.0
18	17.5	11.0	4.0	8.0	10.0	13.0	17.0	20.0	29.0	33.0	35.0	25.5
19	16.0	8.0	4.0	9.0	7.0	12.0	17.0	20.0	29.0	33.0	35.5	26.0
20	17.0	7.0	3.0	10.0	6.0	11.0	18.0	22.5	28.0	34.0	35.5	26.0
21	17.5	5.0	5.0	9.0	5.0	11.0	18.0	23.0	28.5	34.0	35.5	26.0
22	17.5	5.5	5.5	7.5	7.0	13.0	16.0	24.0	30.0	35.0	36.0	26.0
23	20.0	5.5	5.5	7.0	8.0	14.0	19.0	23.0	27.5	33.0	28.0	26.5
24	20.0	5.0	.5	7.5	11.5	16.0	20.5	22.0	29.0	33.0	29.0	25.5
25	19.0	4.5	4.0	7.0	12.0	17.0	20.5	22.5	29.0	33.0	29.0	24.5
26	20.0	4.5	4.0	7.0	10.5	16.5	20.0	21.5	29.0	33.0	28.0	24.0
27	19.0	4.5	5.0	5.0	10.0	17.5	19.0	21.0	29.0	34.0	25.0	26.0
28	19.0	2.5	4.5	5.0	10.0	18.0	19.5	22.0	28.5	33.5	24.0	24.5
29	17.5	2.0	4.0	6.5	---	19.0	20.5	24.5	30.0	33.5	23.5	23.0
30	16.0	1.0	5.0	7.0	---	20.0	23.0	24.0	29.0	34.0	22.0	22.0
31	15.0	---	5.5	8.0	---	21.0	---	25.0	---	34.0	21.0	---
MEAN	16.0	8.0	3.5	6.0	7.0	14.0	18.5	23.0	27.5	32.0	32.0	24.5
WTR YR 1986	MEAN	17.5		MAX	36.0		MIN	.0				

## ARKANSAS RIVER BASIN

## 07151000 SALT FORK ARKANSAS RIVER AT TONKAWA, OK

LOCATION.--Lat 36°40'13", long 97°18'33", in NW 1/4 SE 1/4 sec.4, T.25 N., R.1 W., Kay County, Hydrologic Unit 11060004, near right bank on downstream side of pier of bridge on U.S. Highway 77 in Tonkawa, 4 mi downstream from Thompson Creek, 7.8 mi upstream from Chikaskia River, and at mile 33.8.

DRAINAGE AREA.--4,528 mi<sup>2</sup>, of which 8 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--September 1903 to October 1905 (gage heights only), October 1935 to current year. Monthly discharge only for some periods, published as Arkansas River (Salt Fork) near Tonkawa 1903-4 and as "near Tonkawa" 1905.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 930.22 ft, U.S. Army Corps of Engineers datum. September 1903 to October 1905, nonrecording gage near present site at different datum. Jan. 2, 1936 to Jan. 22, 1939, nonrecording gage, and Jan. 23, 1939 to June 20, 1960, water-stage recorder at site 100 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Dec. 1-3, 12-15, 29-31, Jan. 1-15, Feb. 10-12, Aug. 14, 28-30, and Sept. 1-28. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation since June 1941 by Great Salt Plains Lake, 69.5 mi upstream (station 07150000).

AVERAGE DISCHARGE.--(Since regulation by Great Salt Plains Dam) 45 years (water years 1942-86) 744 ft<sup>3</sup>/s, 539,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 97,300 ft<sup>3</sup>/s, Oct. 11, 1973, gage height, 28.98 ft; no flow Aug. 31 to Oct. 12, and Oct. 14-16, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 10, 1923, reached a stage of 26.8 ft, from information by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, occurred on rising stage, peak occurred on Oct. 1, 1986. Peak discharges greater than base discharge of 11,000 ft<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. 16	1630	11,500	16.35	Sept. 30	2330	*19,300	*22.53
Nov. 15	2330	18,000	20.05				

Minimum daily discharge, 44 ft<sup>3</sup>/s, Sept. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2860	1080	930	690	477	479	355	186	424	1160	95	461
2	1950	1030	900	680	480	464	363	249	412	1090	104	430
3	1210	931	900	670	472	459	358	226	733	1490	241	385
4	977	883	960	660	466	455	364	254	2130	1380	144	340
5	791	833	937	655	469	450	355	277	3470	1140	141	305
6	687	774	980	650	483	451	412	283	3670	999	237	275
7	595	748	881	645	480	432	391	274	4820	1090	193	245
8	526	707	816	645	487	442	363	243	5710	846	123	222
9	516	697	819	640	498	395	356	212	5840	845	141	198
10	590	697	842	635	470	408	266	168	4150	834	440	179
11	2610	639	881	630	460	513	284	178	3640	692	359	160
12	4860	599	820	625	475	472	296	333	3220	577	160	143
13	5810	886	800	620	508	390	299	321	2720	501	113	129
14	7880	1560	800	615	495	435	289	283	2460	434	95	115
15	9910	13200	825	610	500	453	287	270	2280	319	339	101
16	11200	14600	847	604	496	441	348	267	2470	344	1580	102
17	9730	6540	761	600	497	449	290	762	2340	297	1130	99
18	9190	3630	740	598	517	460	237	2080	2640	251	1150	95
19	6600	2470	796	589	526	484	217	2020	1860	219	1160	84
20	5210	2060	822	586	525	545	222	1370	1630	184	1050	76
21	4480	1840	828	574	526	502	215	1010	1460	168	872	69
22	3900	1590	820	568	530	468	220	801	1370	148	778	61
23	3430	1460	1150	571	531	457	211	692	1560	158	688	51
24	3060	1360	1690	537	529	461	202	624	2150	146	586	49
25	2680	1270	1280	514	515	428	196	580	2610	135	521	44
26	2280	1200	1000	504	509	422	206	519	2020	130	502	46
27	2010	1160	944	511	489	431	214	506	1800	132	489	49
28	1750	1080	819	505	486	340	206	482	1610	120	450	54
29	1530	1050	750	491	---	344	257	463	1520	108	435	2750
30	1330	1010	725	486	---	373	235	462	1310	102	420	16400
31	1180	---	700	469	---	400	---	445	---	100	454	---
TOTAL	111332	67584	27763	18377	13896	13703	8514	16840	74029	16139	15190	23717
MEAN	3591	2253	896	593	496	442	284	543	2468	521	490	791
MAX	11200	14600	1690	690	531	545	412	2080	5840	1490	1580	16400
MIN	516	599	700	469	460	340	196	168	412	100	95	44
AC-FT	220800	134100	55070	36450	27560	27180	16890	33400	146800	32010	30130	47040

CAL YR 1985 TOTAL 431323 MEAN 1182 MAX 14600 MIN 79 AC-FT 855500  
WTR YR 1986 TOTAL 407084 MEAN 1115 MAX 16400 MIN 44 AC-FT 807500

## 07152000 CHIKASKIA RIVER NEAR BLACKWELL, OK

LOCATION.--Lat 36°48'41", long 97°16'41", in NE 1/4 NW 1/4 sec.23, T.27 N., R.1 W., Kay County, Hydrologic Unit 11060005, near left bank on downstream side of State Highway 11 bridge at northeast edge of Blackwell, 0.2 mi downstream from Bitter Creek, and at mile 28.2.

DRAINAGE AREA.--1,859 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1935 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 967.41 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). See WSP 1921 for history of changes prior to April, 1952.

REMARKS.--Estimated daily discharges: Dec. 3-11, 16-20, Jan. 10-12, and Feb. 14-17. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation at low flow by Lake Blackwell, capacity 3,600 acre-ft, 12.6 mi above station. Small diversion made from reservoir for municipal supply of city of Blackwell.

AVERAGE DISCHARGE.--51 years, 891 ft<sup>3</sup>/s, 360,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 85,000 ft<sup>3</sup>/s, June 22, 1942, gage height, 33.3 ft, from floodmark present datum; maximum gage height, 33.85 ft, Oct. 11, 1973, no flow at times in 1954, and 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 10, 1923, reached a stage of about 34 ft, present site and datum, from information by local residents, discharge 100,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,000 ft<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. 12	0800	*56,600	*33.42	June 5	2300	8,020	22.22
Oct. 15	0300	15,700	28.91	Sept. 30	1600	32,700	32.33
Nov. 15	1200	25,000	31.11				

Minimum daily discharge, 3.6 ft<sup>3</sup>/s, Sept. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2060	554	414	416	320	276	608	264	319	236	41	101
2	818	531	305	413	315	271	2230	256	427	481	41	84
3	533	517	305	409	323	264	995	208	1500	455	40	80
4	422	498	330	408	331	262	719	191	980	387	37	79
5	351	486	345	393	424	259	497	168	4530	346	55	139
6	311	476	365	385	407	255	373	153	4680	350	62	105
7	279	462	385	364	372	251	317	149	2660	1250	61	122
8	268	455	402	303	357	247	285	144	5340	836	65	95
9	415	453	420	306	340	247	264	117	1930	400	74	78
10	4610	440	446	315	331	250	253	300	2280	245	84	74
11	22100	439	446	335	311	244	237	797	4740	195	98	77
12	44000	448	430	350	292	263	234	585	1870	206	105	76
13	7900	1090	413	367	282	275	223	439	863	361	74	76
14	10200	3330	355	369	285	316	233	312	597	1520	97	64
15	11500	20300	362	364	300	345	289	274	481	831	617	53
16	2910	9860	393	366	317	311	242	251	422	177	472	84
17	1540	2080	404	365	340	286	229	542	376	105	323	137
18	3470	1160	425	368	402	298	214	3300	347	53	199	83
19	3200	919	440	363	388	313	210	2560	375	90	141	49
20	1330	785	460	358	361	346	207	912	309	57	109	36
21	1060	680	476	356	331	306	202	578	277	71	86	31
22	929	624	535	345	318	275	193	445	279	71	77	18
23	846	600	1080	340	303	262	185	378	315	74	74	3.6
24	796	579	1130	333	296	251	178	328	408	69	439	3.9
25	742	565	570	327	296	243	174	298	342	64	231	4.2
26	693	553	441	324	294	239	193	278	255	63	115	7.6
27	657	546	476	314	286	233	227	283	222	57	81	7.9
28	635	540	503	311	277	234	223	305	201	61	572	6.9
29	612	509	463	312	---	231	223	354	187	71	286	1740
30	589	497	435	317	---	229	205	371	176	56	176	22800
31	575	---	421	321	---	228	---	411	---	47	126	---
TOTAL	126351	50976	14375	10917	9199	8310	10862	15951	37688	9285	5058	26315.1
MEAN	4076	1699	464	352	329	268	362	515	1256	300	163	877
MAX	44000	20300	1130	416	424	346	2230	3300	5340	1520	617	22800
MIN	268	439	305	303	277	228	174	117	176	47	37	3.6
AC-FT	250600	101100	28510	21650	18250	16480	21540	31640	74750	18420	10030	52200
CAL YR 1985	TOTAL	374598		MEAN	1026	MAX	44000	MIN	33	AC-FT	743000	
WTR YR 1986	TOTAL	325287.1		MEAN	891	MAX	44000	MIN	3.6	AC-FT	645200	



LOCATION.--Lat 36°30'09", long 96°43'22", in NW 1/4 sec.1, T.23 N., R.5 E., Osage County, Hydrologic Unit 11060006, near left bank on downstream side of pier of bridge on State Highway 18 at Ralston, 2 mi downstream from Salt Creek, 2 mi upstream from Grayhorse Creek, and at mile 594.0.

DRAINAGE AREA.--54,465 mi<sup>2</sup>, of which 7,615 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1925 to current year. Monthly discharge only for some periods, published in WSP 1311.  
Gage-height records collected in this vicinity since 1922 are contained in reports of National Weather Service.

REVISID RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 776.70 ft. National Geodetic Vertical Datum of 1929.

Oct. 1, 1925 to Nov. 13, 1935, nonrecording gage at site of former highway bridge 1,200 ft downstream at same datum. Nov. 14, 1935 to Feb. 23, 1939, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 9-14, 17, and Sept. 20, 21. Records fair. Flow regulated since April 1976 by Kaw Lake (station 07148130) 59.7 mi upstream; some regulation by Great Salt Plains Lake (station 07150000) since 1941.

AVERAGE DISCHARGE.--(Prior to regulation by Kaw Dam) 50 years (water years 1926-75), 4,826 ft<sup>3</sup>/s, 3,496,000 acre-ft/yr; (since regulation by Kaw Dam) 10 years (water years 1977-86), 4,712 ft<sup>3</sup>/s, 3,414,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 211,000 ft<sup>3</sup>/s, Oct. 13, 1973, gage height, 22.98 ft; minimum discharge, 14 ft<sup>3</sup>/s, Oct. 12, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 11, 1923, reached a stage of 23.8 ft, referred to outside gage on basis of stages observed in 1923 and 1944 at site 1,200 ft downstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 103,000 ft<sup>3</sup>/s, Sept. 30, gage height, 17.87 ft, minimum daily discharge, 1.110 ft<sup>3</sup>/s, Sept. 24, 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8000	10300	5230	5010	2670	2420	1760	1950	4490	5200	2000	2860
2	10100	5980	5140	4970	2810	1930	2330	2080	4430	5120	1990	2840
3	10400	5220	5070	4920	2870	1760	7560	2210	4490	5030	2020	3220
4	8290	4960	4210	4260	2890	1720	12600	2340	4860	5010	2040	4140
5	6590	4790	4580	4800	2750	2180	7340	2290	7270	4230	2090	2930
6	5500	4610	6620	4870	2540	2440	5890	2310	10200	3970	2140	2950
7	5240	4490	8190	5620	2810	2470	5300	2570	13700	3790	2410	2480
8	4590	4540	8160	7270	4100	2520	4770	5940	14700	3950	3810	2380
9	3420	4320	8130	7250	4200	2550	3650	8700	14400	6450	3910	2330
10	2940	4740	8140	7060	4250	2510	3400	9360	12800	8820	3670	2260
11	4200	4740	8170	7070	4100	2480	3140	14300	10200	10100	3610	2070
12	20200	4650	8110	7040	3490	2580	2630	11200	13800	10100	3410	1960
13	39000	4610	8050	6960	2960	2390	2290	11300	16000	10400	3480	1890
14	48800	6540	7810	6820	2860	2240	2300	12900	13600	8370	3420	1830
15	38900	10100	7600	6680	2840	2190	2270	12900	14100	8960	3750	1800
16	42300	39100	7720	5960	2810	2060	2150	11400	14900	15300	3800	2070
17	37400	30400	7380	3930	2820	2050	2180	17900	11800	17400	3130	2020
18	39100	19200	6480	3370	2850	1970	2260	12800	7360	16800	3410	1760
19	43600	12000	6340	3320	2870	1920	2140	12000	5850	13300	3320	1590
20	35000	8580	6300	3290	2870	2120	2030	12100	5210	10000	5750	1400
21	28700	8440	6030	3150	2910	2180	1950	11900	4790	9670	7940	1300
22	25900	7980	5440	2890	2860	2340	1920	12400	4520	9400	6420	1210
23	24500	8420	5320	2600	2820	2300	1920	11900	4510	8670	3530	1160
24	23400	9280	5370	2440	2790	2220	1900	11500	5230	6350	2980	1110
25	22500	9100	6360	2090	2770	2200	1850	11300	5170	3950	2760	1110
26	21700	8190	6390	2110	2710	2140	1770	11100	4970	3080	2620	1740
27	20800	5320	5640	2170	2640	1940	1850	11100	4730	3070	2710	5860
28	20100	5560	5360	2160	2590	1890	1950	10400	4730	3000	2620	2860
29	17800	5440	5260	2450	---	1740	1940	7790	5400	2940	2560	9650
30	16400	5320	5180	2650	---	1660	1890	4980	5280	2450	2640	79600
31	14800	---	5070	2710	---	1670	---	4660	---	2150	2850	---
TOTAL	650170	266920	198850	137890	84450	66780	96730	277580	253490	227030	102790	152380
MEAN	20970	8897	6415	4448	3016	2154	3224	8954	8450	7324	3316	5079
MAX	48800	39100	8190	7270	4250	2580	12600	17900	16000	17400	7940	79600
MIN	2940	4320	4210	2090	2450	1660	1760	1950	4430	2150	1990	1110
AC-FT	1290000	529400	394400	273500	167500	132500	191900	550600	502800	450300	203900	302200
CAL YR 1985	TOTAL 3015650 MEAN 8262 MAX 48800 MIN 1060 AC-FT 5982000											
WTR YR 1986	TOTAL 2515060 MEAN 6891 MAX 79600 MIN 1110 AC-FT 4989000											

## ARKANSAS RIVER BASIN

07152500 ARKANSAS RIVER AT RALSTON, OK--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-63, 1965 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: January 1950 to September 1963, July 1968 to current year.

WATER TEMPERATURE: January 1950 to September 1963, July 1968 to current year.

INSTRUMENTATION.--Water quality monitor July 1968 to September 1980.

REMARKS.--Samples were collected by a local observer on a daily basis. Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 7,510 microsiemens, Sept. 14, 1955; minimum daily, 157 microsiemens, Nov. 21, 1979.

WATER TEMPERATURE: Maximum daily, 37.0 °C, July 28, 1956; minimum daily, -0.5 °C on many days during winter period.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily (more than 20 percent missing record), 2,770 microsiemens, Aug. 25; minimum daily, 184 microsiemens, Sept. 30.

WATER TEMPERATURE: Maximum daily (more than 20 percent missing record), 29.0 °C Aug. 18, 22; minimum daily, 0.0 °C on several days during winter period.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	
NOV 21...	1145	1028	80020	6.35	8480	750	8.00	-1.0	6.5	73	740	
JAN 15...	1600	1028	1028	5.86	6750	435	8.20	20.5	7.5	--	--	
FEB 04...	1510	1028	80020	3.96	2860	1380	8.50	14.0	13.5	3.6	730	
MAR 19...	0815	1028	80020	3.60	1910	1540	8.34	8.0	9.5	4.6	740	
MAY 28...	1100	1028	80020	6.71	9690	814	7.92	29.0	22.0	20	740	
JUN 19...	1455	1028	1028	5.61	5920	1160	8.20	27.0	35.5	--	740	
JUL 23...	1430	1028	80020	6.57	9170	670	7.40	31.0	28.0	50	740	
AUG 27...	1830	1028	1028	4.16	2760	1770	8.43	27.0	35.5	--	740	
SEP 30...	0830	1028	80020	15.83	77200	135	7.37	23.0	20.5	660	750	
DATE		OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS./ PER 100 ML)	HARD-NESS (MG/L AS CAC03)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO
NOV 21...	11.5	97	>600	K140	210	79	61	13	78	44	2	
JAN 15...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 04...	11.4	115	--	--	340	140	92	26	180	53	4	
MAR 19...	12.4	112	K3	K1	330	120	88	27	190	55	5	
MAY 28...	8.7	103	K1400	140	210	45	64	12	73	43	2	
JUN 19...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 23...	7.8	103	24	K9	--	--	56	--	--	--	--	--
AUG 27...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 30...	--	--	--	--	54	0	18	2.1	4.7	15	0.3	

## ARKANSAS RIVER BASIN

07152500 ARKANSAS RIVER AT RALSTON, OK--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
NOV 21...	4.9	156	0	128	2.5	62	120	0.30	10	420	430
JAN 15...	--	--	--	--	--	--	--	--	--	--	--
FEB 04...	4.1	211	15	198	1.1	150	270	0.30	8.3	843	870
MAR 19...	4.1	249	5.0	212	1.8	160	300	0.40	2.7	902	910
MAY 28...	3.8	200	0	164	3.8	54	120	0.30	6.7	445	430
JUN 19...	--	--	--	--	--	--	--	--	--	--	--
JUL 23...	--	173	0	142	11	56	--	--	3.9	402	--
AUG 27...	--	--	--	--	--	--	--	--	--	--	--
30...	3.4	71	0	58	4.8	9.9	5.6	0.20	8.0	89	87

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)
NOV 21...	0.57	9620	0.950	4.2	0.010	0.03	0.960	0.120	0.050	0.06	0.58
JAN 15...	--	--	--	--	--	--	--	--	--	--	--
FEB 04...	1.1	6510	0.910	4.0	0.020	0.07	0.930	0.050	0.060	0.08	0.55
MAR 19...	1.2	4650	0.240	--	0.020	0.07	0.260	0.070	0.090	0.12	0.83
MAY 28...	0.61	11600	--	--	<0.010	--	0.620	0.060	0.050	0.06	0.54
JUN 19...	--	--	--	--	--	--	--	--	--	--	--
JUL 23...	--	--	--	--	--	--	--	0.090	--	--	--
AUG 27...	--	--	--	--	--	--	--	--	--	--	--
SEP 30...	0.12	18600	0.220	--	0.010	0.03	0.230	0.100	0.130	0.17	2.0

DATE	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)
NOV 21...	0.70	0.310	0.95	0.200	0.140	0.43	60	2	120	<0.5
JAN 15...	--	--	--	--	--	--	--	--	--	--
FEB 04...	0.60	0.150	--	0.100	0.090	0.28	<10	2	150	<0.5
MAR 19...	0.90	0.110	--	0.040	0.040	0.12	<10	2	150	<0.5
MAY 28...	0.60	0.170	--	0.100	0.090	0.28	--	--	--	--
JUN 19...	--	--	--	--	--	--	--	--	--	--
JUL 23...	--	0.200	--	--	--	--	20	3	110	<0.5
AUG 27...	--	--	--	--	--	--	--	--	--	--
SEP 30...	2.1	0.240	--	0.070	0.060	0.18	--	--	--	--

## ARKANSAS RIVER BASIN

37

07152500 ARKANSAS RIVER AT RALSTON, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)
NOV 21...	2	<1	<3	3	43	<1	11	12	<0.1	<10
JAN 15...	--	--	--	--	--	--	--	--	--	--
FEB 04...	1	<1	<3	3	3	2	16	5	<0.1	<10
MAR 19...	<1	<1	<3	1	<3	<1	25	7	<0.1	<10
MAY 28...	--	--	--	--	--	--	--	--	--	--
JUN 19...	--	--	--	--	--	--	--	--	--	--
JUL 23...	<1	<1	<3	4	5	<5	10	<1	0.1	<10
AUG 27...	--	--	--	--	--	--	--	--	--	--
SEP 30...	--	--	--	--	--	--	--	--	--	--

DATE	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 21...	4	<1	<1	540	<6	15	109	2500	97
JAN 15...	--	--	--	--	--	--	--	--	--
FEB 04...	<1	1	<1	1100	<6	91	11	85	81
MAR 19...	2	1	<1	1000	<6	9	11	57	81
MAY 28...	--	--	--	--	--	--	58	1520	91
JUN 19...	--	--	--	--	--	--	--	--	--
JUL 23...	4	<1	<1	660	9	<3	83	2050	86
AUG 27...	--	--	--	--	--	--	--	--	--
SEP 30...	--	--	--	--	--	--	3840	800000	83



## ARKANSAS RIVER BASIN

07152500 ARKANSAS RIVER AT RALSTON, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1090	495	---	1090	1540	---	1670	1630	1280	1070	1270	---
2	1060	754	1080	1070	1460	1660	---	1230	---	998	1410	1170
3	763	---	1060	---	1450	1870	834	---	---	1050	---	1370
4	590	951	964	---	---	1860	374	---	1190	---	---	1080
5	836	943	1140	1160	1480	1790	626	1610	1100	---	---	---
6	1050	---	999	1130	1570	1590	906	1590	734	---	---	1510
7	---	---	795	1110	1600	1570	1010	1640	717	1310	---	1600
8	---	983	781	959	---	---	1120	1370	796	1360	---	1720
9	1330	---	766	926	1250	1600	1230	1220	1000	---	---	1570
10	1340	1020	---	---	1240	1530	1360	1090	1120	---	---	1670
11	1500	958	764	950	---	---	---	381	---	---	601	1480
12	697	914	766	---	1400	1450	1460	866	1140	728	825	---
13	627	891	735	1030	1440	1480	1720	1080	---	686	908	1660
14	---	758	743	994	1450	1610	1530	1160	---	677	---	---
15	535	---	740	1070	1480	---	1470	918	706	771	692	1830
16	417	452	758	1050	---	1440	1560	1050	749	723	704	1800
17	448	---	---	---	1510	---	---	310	764	---	---	1350
18	392	444	930	---	1500	1770	1540	520	---	713	1280	1770
19	363	570	---	1410	---	1580	1650	867	1080	711	---	1940
20	386	727	1030	1400	1510	---	1570	---	1280	---	---	---
21	416	768	---	1410	1570	1590	1600	1030	1240	698	862	---
22	382	---	1060	---	1590	1660	1540	942	---	735	865	2080
23	381	---	951	1580	1690	1790	1570	983	1460	723	---	2110
24	426	---	---	---	1880	1680	1600	987	1170	836	---	2230
25	---	783	---	---	1620	1660	1700	903	---	---	2770	2340
26	---	---	953	---	1870	1710	1730	---	1080	930	---	---
27	416	---	872	1630	1610	1720	---	883	---	---	2410	2380
28	406	---	938	1630	1680	1770	---	791	1410	1020	1870	794
29	420	1070	1030	1690	---	---	1650	855	---	---	1910	---
30	456	1070	1020	1590	---	---	---	1140	1380	---	1720	184
31	---	---	1040	1480	---	1760	---	---	---	---	---	---
MEAN	669	808	913	1260	1540	1660	1380	1040	1070	874	1340	1620
WTR YR 1986	MEAN	1180	MAX	2770	MIN	184						

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.0	13.0	---	3.0	11.0	---	17.0	19.0	---	27.0	26.0	---
2	21.0	13.0	.0	4.0	12.0	8.0	---	18.0	---	26.0	25.0	24.0
3	22.0	---	.0	---	13.0	9.0	17.0	---	---	27.0	---	24.0
4	---	13.0	3.0	---	---	9.0	15.0	---	---	---	---	24.0
5	---	14.0	4.0	2.0	10.0	10.0	15.0	19.0	---	---	---	---
6	---	---	5.0	3.0	7.0	9.0	18.0	22.0	---	---	---	25.0
7	---	---	6.0	1.0	5.0	9.0	20.0	23.0	---	27.0	---	21.0
8	---	11.0	5.0	.0	---	---	20.0	21.0	26.0	27.0	---	19.0
9	---	---	6.0	.0	2.5	13.0	16.0	21.0	27.0	---	---	20.0
10	---	11.0	---	---	.0	12.0	15.0	21.0	26.0	---	---	24.0
11	---	9.0	3.0	2.0	---	---	---	20.0	---	---	25.0	24.0
12	---	10.0	2.0	---	.5	11.0	18.0	21.0	25.0	26.0	25.0	---
13	---	14.0	1.0	3.0	.0	12.0	19.0	22.0	---	26.0	25.0	23.0
14	---	14.0	.0	3.0	1.0	19.0	14.0	21.0	---	26.0	---	---
15	---	---	2.0	3.0	11.0	---	11.0	20.0	24.0	27.0	26.0	23.0
16	---	19.0	3.0	6.0	---	11.0	13.0	22.0	25.0	26.0	25.0	25.0
17	---	---	---	---	8.0	---	---	19.0	26.0	---	---	23.0
18	---	14.0	3.0	---	9.0	9.0	16.0	19.0	---	27.0	29.0	24.0
19	---	12.0	---	6.0	---	9.0	16.0	18.0	27.5	27.0	---	24.0
20	---	7.0	1.0	5.0	10.0	---	14.0	---	26.0	---	---	---
21	---	6.0	---	8.0	3.0	8.0	15.0	20.0	27.0	26.0	28.0	---
22	---	---	3.0	---	2.0	9.0	14.0	21.0	---	27.0	29.0	25.0
23	---	---	4.0	3.0	3.0	12.0	15.0	22.0	26.0	27.0	---	25.0
24	---	---	---	---	3.0	12.0	17.0	22.0	26.0	27.0	---	25.0
25	---	7.0	---	---	7.0	14.0	19.0	22.0	---	---	27.0	25.0
26	---	---	.0	---	6.0	15.0	19.0	---	27.0	28.0	---	---
27	---	---	1.0	.0	6.0	14.0	---	22.0	---	---	26.0	25.0
28	---	---	2.0	1.0	6.0	16.0	---	---	27.0	28.0	21.0	24.0
29	---	6.0	2.0	4.0	---	---	18.0	---	---	---	20.5	---
30	14.5	4.0	3.0	4.0	---	---	---	---	28.0	---	21.0	24.0
31	---	---	4.0	4.0	---	18.0	---	---	---	---	---	---
MEAN	19.5	11.0	2.5	3.0	6.0	11.5	16.5	20.5	26.0	27.0	25.0	23.5
WTR YR 1986	MEAN	15.0	MAX	29.0	MIN	.0						

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

## ARKANSAS RIVER BASIN

39

## 07153000 BLACK BEAR CREEK AT PAWNEE, OK

LOCATION.--Lat 36°20'37", long 96°47'57", on east line of SE 1/4 NE 1/4 sec.31, T.22 N., R.5 E., Pawnee County, Hydrologic Unit 11060006, on downstream side of left pier of bridge on State Highway 18 in north Pawnee, 300 ft downstream from Skedee Creek, and at mile 23.4.

DRAINAGE AREA.--576 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1944 to current year.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 802.73 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 21, 1944, nonrecording gage at present site and datum except for Aug. 27, 1953 to Apr. 29, 1954, nonrecording gage at site 500 ft downstream at same datum.

REMARKS.--Estimated daily discharges: June 2, 3, July 6, 7, 12-23, 28-31, and Aug. 1-5. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--42 years, 172 ft<sup>3</sup>/s, 124,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,200 ft<sup>3</sup>/s, Oct. 3, 1959, gage height, 31.43 ft; no flow at times in many years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 19, 1943, reached a stage of 28.19 ft, from floodmark, discharge 17,800 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft<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)
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Sept. 30	1100	*7,640	*17.26	No other peak greater than base discharge.			
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Minimum daily discharge, 3.7 ft<sup>3</sup>/s, Aug. 4, and Sept. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	264	43	59	23	15	15	27	27	35	40	6.5	6.9
2	147	36	37	23	15	15	357	18	31	53	5.0	5.9
3	83	26	32	22	16	14	1480	14	27	110	4.1	5.6
4	57	20	34	25	17	13	2780	12	74	60	3.7	5.8
5	37	19	35	21	19	14	678	11	1050	41	5.5	6.9
6	28	17	35	19	19	14	353	11	1920	31	8.5	18
7	22	17	36	18	19	14	227	10	988	26	64	30
8	18	16	35	15	20	14	156	11	1150	62	412	15
9	14	16	36	15	20	15	104	13	763	178	142	9.9
10	19	15	35	17	21	19	76	52	416	66	267	10
11	32	15	37	16	21	23	61	976	494	40	287	9.0
12	26	282	32	17	20	47	51	951	623	30	134	16
13	20	544	34	18	19	45	45	379	276	23	71	14
14	224	1180	23	19	20	32	66	250	190	18	39	6.7
15	191	2500	28	19	20	25	41	243	1170	16	26	5.8
16	61	1750	27	20	22	24	32	214	1820	13	154	5.4
17	35	700	29	20	23	22	35	1590	768	11	153	5.5
18	1640	486	30	19	22	23	42	2380	751	9.5	84	5.0
19	2600	476	27	18	23	23	43	1030	484	8.2	46	5.3
20	1010	259	29	17	21	20	49	562	300	7.3	28	5.5
21	599	170	28	19	20	19	41	356	207	6.4	21	5.0
22	373	126	28	17	21	17	30	238	161	5.9	16	4.9
23	253	101	29	16	20	18	25	166	208	5.4	13	4.3
24	214	83	29	16	19	16	23	116	555	305	11	4.0
25	156	70	23	17	18	16	21	86	298	163	9.3	3.8
26	111	65	25	35	17	16	19	140	191	63	7.8	4.1
27	81	55	24	26	18	15	23	88	144	36	8.0	4.0
28	64	46	22	19	16	16	22	63	93	26	7.5	3.7
29	55	42	21	15	---	15	47	66	65	16	6.8	1560
30	51	41	23	14	---	15	37	51	47	11	7.1	7140
31	46	---	23	14	---	15	---	42	---	8.0	6.9	---
TOTAL	8531	9216	945	589	541	609	6991	10166	15299	1488.7	2054.7	8926.0
MEAN	275	307	30.5	19.0	19.3	19.6	233	328	510	48.0	66.3	298
MAX	2600	2500	59	35	23	47	2780	2380	1920	305	412	7140
MIN	14	15	21	14	15	13	19	10	27	5.4	3.7	3.7
AC-FT	16920	18280	1870	1170	1070	1210	13870	20160	30350	2950	4080	17700
CAL YR 1985	TOTAL	115228.7	MEAN	316	MAX	6270	MIN	2.6	AC-FT	228600		
WTR YR 1986	TOTAL	65356.4	MEAN	179	MAX	7140	MIN	3.7	AC-FT	129600		

## ARKANSAS RIVER BASIN

## 07154500 CIMARRON RIVER NEAR KENTON, OK

LOCATION.--Lat 36°55'36", long 102°57'31", in SE 1/4 sec.4; T.5 N., R.1 E., Cimarron County, Hydrologic Unit 11040001, near right bank on downstream side of pier of county road bridge, 1.5 mi upstream from North Carrizo Creek, 1.7 mi northeast of Kenton, 2.2 mi downstream from Carrizozo Creek, and at mile 594.0.

DRAINAGE AREA.--1,106 mi<sup>2</sup>, of which 68 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--April 1904 to July 1905 (gage heights only), October 1950 to current year.

REVISED RECORDS.--WSP 1711: 1956 (M).

GAGE.--Water-stage recorder. Datum of gage is 4,262.08 ft, National Geodetic Vertical Datum of 1929 (levels by Oklahoma State Highway Department). April 1904 to July 1905 nonrecording gage at site 0.9 mi upstream at different datum. Oct. 1, 1950 to Sept. 19, 1967, water-stage recorder at same site and at datum 5.00 ft higher.

REMARKS.--Estimated daily discharges: May 4-14, July 16-18, 24-27, Aug. 4, Aug. 27 to Sept. 1, 6, 8, 12-28, 30. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Extensive diversions for irrigation above station.

AVERAGE DISCHARGE.--36 years (water years 1951-86), 20.5 ft<sup>3</sup>/s, 14,850 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 43,400 ft<sup>3</sup>/s Oct. 17, 1965, gage height, 22.32 ft, present datum; from rating curve extended above 7,000 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft<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)
Sept. 2	0900	3,900	14.02	Sept. 9	0745	*6,100	*15.17

No flow at times during year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.47	.86	.49	.08	.03	.00	.51	.92	.00	6.5
2	.00	.00	.42	.76	.56	.19	.05	137	23	.20	8.5	880
3	.00	.00	.53	.89	.72	.21	.04	37	172	.01	5.1	165
4	.00	.00	.59	.89	.64	.13	.04	11	67	.00	.85	55
5	.00	.00	.59	.93	.49	.09	.05	4.5	56	.00	.80	42
6	.00	.00	.56	.99	.47	.08	.05	1.6	10	.00	.09	16
7	.00	.00	.54	.87	.27	.06	.05	1.1	4.2	.00	.01	20
8	.00	.00	.57	.77	.17	.12	.04	.36	63	.00	2.6	17
9	.00	.00	.56	.71	.18	.24	.05	.14	185	.00	.37	1900
10	.00	.00	.36	.81	.27	.19	.05	.09	38	.00	.06	122
11	.00	.00	.40	.91	.36	.12	.05	.02	9.8	.00	3.9	37
12	.00	.00	.37	.86	.47	.09	.04	.00	3.8	.00	1.2	16
13	.00	.00	.44	.85	.61	.07	.04	.00	1.1	.00	.23	10
14	.00	.02	.45	.75	.85	.07	.00	.00	.83	.87	.02	4.5
15	.00	.07	.45	.74	.85	.09	.02	.00	.89	15	.00	2.9
16	.00	.07	.52	.68	.69	.10	.04	.00	.85	1.3	.00	1.9
17	.13	.10	.64	.63	.29	.09	.03	.00	.68	.58	.00	1.6
18	.09	.10	.73	.56	.14	.14	.00	.00	.36	.26	.00	1.2
19	.00	.10	.95	.49	.11	.10	.02	.00	.16	.08	.00	1.1
20	.00	.10	1.1	.46	.09	.10	.02	.00	.07	.48	.00	1.0
21	.00	.11	1.2	.41	.10	.12	.02	.00	.09	.98	444	.94
22	.00	.14	1.1	.37	.10	.09	.02	.00	.02	157	72	.91
23	.00	.23	1.1	.41	.08	.06	.00	.00	.00	37	364	.90
24	.00	.27	1.0	.42	.18	.05	.00	.00	.00	10	97	.89
25	.00	.30	1.1	.37	.15	.03	.00	42	.00	1.6	16	.83
26	.00	.25	1.1	.41	.13	.05	.00	12	.00	.68	12	.80
27	.00	.22	.98	.45	.12	.05	.02	4.7	.01	.33	6.3	.75
28	.00	.26	1.0	.47	.09	.04	.01	1.3	.33	.41	3.8	.89
29	.00	.31	1.1	.47	---	.02	.00	.35	1.2	.28	1.9	3.7
30	.00	.36	1.1	.46	---	.04	.00	.20	1.8	.11	.83	3.5
31	.00	---	.97	.47	---	.04	---	.58	---	.01	.97	---
TOTAL	.22	3.01	22.99	20.12	9.67	2.95	.78	253.94	640.70	314.23	1042.53	3314.81
MEAN	.01	.10	.74	.65	.35	.09	.03	8.19	21.4	10.1	33.6	110
MAX	.13	.36	1.2	.99	.85	.24	.05	137	185	157	444	1900
MIN	.00	.00	.36	.37	.08	.02	.00	.00	.00	.00	.00	.75
AC-FT	.4	6.0	46	40	19	5.9	1.5	504	1270	623	2070	6570
CAL YR 1985	TOTAL	1642.43		MEAN	4.50	MAX	242	MIN	.00	AC-FT	3260	
WTR YR 1986	TOTAL	5625.95		MEAN	15.4	MAX	1900	MIN	.00	AC-FT	11160	

ARKANSAS RIVER BASIN

41

07156900 CIMARRON RIVER NEAR FORGAN, OK

LOCATION.--Lat 37°00'45", long 100°29'30", in SE 1/4 SE 1/4 sec.8, T.35 S., R.24 E., Mead County, KS, Hydrologic Unit 11040006, near center of span on downstream side of pier of bridge on Kansas State Highway 23, 0.8 mi north of Oklahoma-Kansas State Line, 7.8 mi north of Forgan, and at mile 375.7.

DRAINAGE AREA.--8,536 mi<sup>2</sup>, of which 4,316 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1965 to September 1986 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 2,326.05 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 1-6, 10-16, 25-26, Jan. 1, 6-8, and Feb. 11-14. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Extensive diversion for irrigation above station.

AVERAGE DISCHARGE.--21 years, 70.7 ft<sup>3</sup>/s, 51,220 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,200 ft<sup>3</sup>/s, Oct. 20, 1965, gage height, 8.10 ft; minimum discharge, 14 ft<sup>3</sup>/s, July 10, 1985, July 15-18, 31, and Aug. 12-13, 1986

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft<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)
July 20	0115	*4,440	*4.95	No other peak greater than base discharge.			
Minimum daily discharge, 14 ft <sup>3</sup> /s, July 15-18, 31, and Aug. 12-13.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	46	21	52	57	49	39	26	38	32	18	34
2	40	45	19	61	55	51	35	25	38	22	18	30
3	39	46	23	59	55	52	39	24	32	21	19	37
4	39	45	42	54	58	53	43	25	31	16	19	30
5	37	46	56	44	53	53	48	26	28	15	17	27
6	40	44	61	36	58	46	41	23	25	26	16	28
7	36	45	49	33	60	43	36	22	23	26	15	30
8	38	42	42	35	62	43	39	22	21	26	16	29
9	69	44	48	38	62	41	43	22	23	20	15	28
10	86	51	52	52	63	42	43	23	24	18	18	23
11	58	51	60	50	45	39	45	22	22	17	16	23
12	49	49	66	52	33	40	44	21	18	17	14	22
13	43	50	65	52	37	40	39	20	19	17	14	21
14	35	60	49	48	51	40	42	20	24	15	30	23
15	38	61	39	51	53	48	42	23	24	14	26	22
16	35	55	42	53	55	53	40	24	20	14	22	22
17	37	47	44	51	47	46	39	27	19	14	21	19
18	37	42	48	54	46	49	39	24	19	14	20	20
19	36	42	57	45	46	62	38	19	18	15	22	16
20	37	48	57	44	45	61	36	18	19	441	30	18
21	38	50	54	38	48	61	34	18	18	25	34	22
22	39	46	50	34	49	52	31	20	16	22	26	31
23	38	46	47	37	50	44	36	23	16	29	27	46
24	38	47	47	41	48	39	33	22	16	25	26	32
25	42	47	43	37	44	41	30	26	16	23	24	25
26	41	42	46	38	40	38	30	28	15	20	20	27
27	41	44	50	36	45	36	47	29	20	23	21	23
28	40	40	52	39	48	34	36	27	20	23	24	20
29	43	38	52	41	---	36	32	29	20	19	21	32
30	41	24	51	40	---	39	30	28	19	16	23	33
31	41	---	45	51	---	40	---	32	---	14	33	---
TOTAL	1312	1383	1477	1396	1413	1411	1149	738	661	1039	665	793
MEAN	42.3	46.1	47.6	45.0	50.5	45.5	38.3	23.8	22.0	33.5	21.5	26.4
MAX	86	61	66	61	63	62	48	32	38	441	34	46
MIN	35	24	19	33	33	34	30	18	15	14	14	16
AC-FT	2600	2740	2930	2770	2800	2800	2280	1460	1310	2060	1320	1570

CAL YR 1985 TOTAL 15133 MEAN 41.5 MAX 103 MIN 14 AC-FT 30020  
WTR YR 1986 TOTAL 13437 MEAN 36.8 MAX 441 MIN 14 AC-FT 26650

## 07157580 CIMARRON RIVER NEAR ENGLEWOOD, KS

LOCATION.--Lat 36°58'38", long 99°58'32", in SE 1/4 sec.23, T.9 N., R.26 W., Harper County, OK, Hydrologic Unit 11040008, on the downstream side of bridge on U.S. Highway 283, 4 mi south of Englewood, KS, 10.5 mi north of junction of U.S. Highways 283 and 64, and at mile 341.6.

DRAINAGE AREA.--10,096 mi<sup>2</sup>, of which 4,813 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 11, 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,965.62 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 30 to Dec. 7, 10-18, 21, 22, 25-27, Jan. 4-10, and Feb. 10-15. Records fair, except for winter period which is poor. Flow regulated by canal gates 4.9 mi above station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,560 ft<sup>3</sup>/s, June 10, 1983, gage height, 7.11 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,090 ft<sup>3</sup>/s, July 1, gage height, 6.96 ft; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	44	3.6	47	64	10	.68	.22	.00	173	.00	17
2	45	39	3.3	54	83	17	1.1	.04	.55	53	.00	17
3	39	37	24	54	98	19	.90	.00	9.6	22	.00	38
4	30	42	39	51	95	10	.40	.00	20	13	.00	28
5	27	50	96	33	88	17	.34	.00	25	7.6	.00	23
6	28	51	220	24	75	18	.39	.00	19	6.8	.00	20
7	32	57	210	29	50	24	.60	.00	29	7.8	.00	17
8	30	76	137	27	30	27	.28	.00	26	7.9	.00	17
9	61	81	81	39	19	29	.16	.00	21	5.2	.00	17
10	198	78	42	86	20	43	.17	.00	18	3.1	.00	16
11	113	79	4.0	62	19	40	.25	.00	9.5	2.5	.00	15
12	117	93	2.1	53	15	46	.35	.00	7.2	1.6	.00	13
13	79	106	4.6	55	18	31	.37	.00	3.4	.38	.00	11
14	67	166	26	42	29	33	.12	.00	.64	.00	.00	10
15	55	223	49	41	115	37	.14	.00	.51	.00	.00	9.9
16	48	172	72	39	56	35	.22	.00	7.8	.00	.00	9.2
17	57	118	68	41	30	31	1.4	.00	13	.00	.00	8.3
18	80	107	76	40	26	29	.52	.00	15	.00	.00	7.3
19	78	98	74	45	26	20	.23	.00	13	.00	.00	4.6
20	67	80	56	48	23	18	.14	.00	8.7	53	.00	2.5
21	59	89	66	50	15	17	.04	.00	17	37	.00	1.3
22	50	100	62	47	20	16	.03	.00	8.9	16	.01	.44
23	44	86	32	48	25	20	.01	.00	1.1	9.6	.39	4.8
24	42	68	16	45	25	9.8	.00	.00	.04	4.8	.71	116
25	39	60	8.5	42	23	2.2	.00	.00	.00	1.8	.41	32
26	42	51	12	39	21	.99	.00	.00	.00	.07	12	18
27	49	36	28	49	14	.70	9.0	.00	.00	.00	29	16
28	54	32	42	76	8.9	10	12	.00	.00	.00	17	15
29	53	25	39	75	---	12	10	.00	.00	.00	14	46
30	48	11	59	71	---	11	1.1	.00	.00	.00	11	42
31	54	---	51	62	---	5.7	---	.00	---	.00	24	---
TOTAL	1831	2355	1703.1	1514	1130.9	639.39	40.94	.26	273.94	426.15	108.52	592.34
MEAN	59.1	78.5	54.9	48.8	40.4	20.6	1.36	.008	9.13	13.7	3.50	19.7
MAX	198	223	220	86	115	46	12	.22	29	173	29	116
MIN	27	11	2.1	24	8.9	.70	.00	.00	.00	.00	.00	.44
AC-FT	3630	4670	3380	3000	2240	1270	81	.5	543	845	215	1170

CAL YR 1985 TOTAL 13839.94 MEAN 37.9 MAX 298 MIN .00 AC-FT 27450  
WTR YR 1986 TOTAL 10615.47 MEAN 29.1 MAX 223 MIN .00 AC-FT 21060



## ARKANSAS RIVER BASIN

43

07157580 CIMARRON RIVER NEAR ENGLEWOOD, KS--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year February, 1982 to current year.

REMARKS.--Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)
OCT 03...	1515	1028	80020	5.93	37	3940	8.40	21.5	22.0	703	8.4
30...	1300	1028	80020	5.74	46	3780	8.40	17.0	18.0	708	9.2
DEC 09...	1430	1028	80020	6.01	72	3840	8.30	2.5	2.5	707	14.3
JAN 02...	1300	1028	80020	5.83	50	3830	8.20	11.0	5.0	707	11.0
FEB 11...	1230	1028	80020	5.74	24	4210	8.20	-7.5	0.5	714	14.1
MAR 10...	1500	1028	80020	5.88	43	3870	8.30	14.0	14.5	705	9.6
APR 14...	1500	1028	80020	4.93	0.11	4630	8.40	17.5	17.5	710	8.9
SEP 09...	1630	1028	80020	5.45	17	4400	8.40	31.5	28.0	702	7.1

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)
OCT 03...	106	450	280	100	48	660	76	14	6.4	--	--
30...	106	450	270	110	43	640	75	14	6.3	205	9.0
DEC 09...	115	440	240	110	40	570	74	12	5.4	236	5.0
JAN 02...	94	450	260	110	42	640	75	14	5.9	--	--
FEB 11...	106	490	260	120	47	650	74	13	5.8	285	0
MAR 10...	103	420	230	98	42	670	77	15	6.1	220	6.0
APR 14...	102	750	500	170	80	700	67	11	7.3	280	16
SEP 09...	100	390	240	80	45	750	81	17	7.0	150	12

DATE	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, DIS- SOLVED TOTAL (MG/L AS N)
OCT 03...	--	1.3	230	1100	1.0	9.4	2230	2300	3.0	223	<0.100
30...	183	1.3	210	1000	0.90	11	2180	2100	3.0	268	<0.100
DEC 09...	202	1.9	260	960	0.90	18	2000	2100	2.7	389	0.600
JAN 02...	--	2.2	220	1000	0.90	19	2110	2100	2.9	285	<0.100
FEB 11...	234	2.9	220	1100	1.0	22	2330	2300	3.2	148	0.500
MAR 10...	191	1.8	210	1000	0.90	13	2080	2200	2.8	240	<0.100
APR 14...	256	1.8	350	1200	1.2	20	2580	2700	3.5	0.79	<0.100
SEP 09...	143	0.9	220	1200	0.90	4.3	2350	2400	3.2	111	<0.100

## ARKANSAS RIVER BASIN

07157580 CIMARRON RIVER NEAR ENGLEWOOD, KS--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, TOTAL (MG/L AS PO4)	ARSENIC TOTAL (UG/L AS AS)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)
OCT											
03...	0.030	0.27	0.30	--	--	0.020	0.06	1	170	10	<10
30...	0.040	0.16	0.20	--	--	0.030	0.09	2	160	<10	20
DEC											
09...	0.070	0.63	0.70	1.3	5.8	0.060	0.18	1	150	<10	10
JAN											
02...	0.040	0.46	0.50	--	--	0.020	0.06	2	160	20	<10
FEB											
11...	0.060	0.54	0.60	1.1	4.9	0.050	--	2	170	<10	<10
MAR											
10...	0.050	0.45	0.50	--	--	0.210	--	--	170	20	<10
APR											
14...	0.050	0.35	0.40	--	--	0.010	--	--	220	20	<10
SEP											
09...	<0.010	--	0.50	--	--	0.050	--	--	180	10	10

DATE	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	SELE- NIUM, TOTAL (UG/L AS SE)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT										
03...	<10	20	<100	10	<0.10	3	20	29	2.9	78
30...	10	30	<100	<10	0.10	3	20	216	27	28
DEC										
09...	10	30	<100	10	--	4	30	404	79	29
JAN										
02...	<10	--	<100	--	<0.10	<1	50	158	21	48
FEB										
11...	<10	30	<100	20	0.10	3	10	435	28	11
MAR										
10...	10	20	<100	10	0.30		20	83	9.6	29
APR										
14...	50	90	<100	40	0.10		10	6	0.00	56
SEP										
09...	10	30	<100	10	<0.10	--	10	30	1.4	92

ARKANSAS RIVER BASIN

45

07157950 CIMARRON RIVER NEAR BUFFALO, OK

LOCATION.--Lat 36°51'07", long 99°18'54", in SE 1/4 NE 1/4 sec.2, T.27 N., R.20 W., Harper County, Hydrologic Unit 11050001, near left bank on downstream side of pier of U.S. Highway 64, 0.5 mi downstream from Keno Creek, 17.0 mi northeast of Buffalo, and at mile 289.1.

DRAINAGE AREA.--12,004 mi<sup>2</sup>, of which 4,813 mi<sup>2</sup> is probably noncontributing.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,599.67 ft, National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1979, at site 6.9 mi upstream at an altitude of 1,650 ft.

REMARKS.--Estimated daily discharges: Nov. 30 to Dec. 6, 11-15, 18-21, Jan. 5, 7-9, and Feb. 10-15. Records fair.

AVERAGE DISCHARGE.--26 years, 137 ft<sup>3</sup>/s, 99,260 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,400 ft<sup>3</sup>/s, Sept. 26, 1973, gage height, 5.57 ft, datum then in use; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft<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)
Aug. 22	0215	*2,850	*7.22	No peaks greater than base discharge			
No flow at times.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	100	28	92	84	71	23	22	7.5	6.3	.04	75
2	4.1	89	24	93	83	72	21	17	196	9.1	.02	64
3	3.8	80	26	86	87	69	25	12	547	81	.00	141
4	3.1	73	39	85	96	69	20	9.6	278	49	.00	321
5	2.6	67	51	65	98	69	17	9.1	424	12	.05	234
6	2.4	64	64	75	97	57	18	8.1	256	7.7	.00	128
7	2.2	56	77	44	98	57	24	6.0	244	4.4	.00	101
8	2.3	54	238	22	103	56	16	6.5	280	3.0	.00	61
9	113	56	215	30	98	60	14	11	222	1.7	39	47
10	1250	55	138	65	85	57	15	7.9	153	.96	2.9	38
11	1010	53	66	98	60	53	15	7.0	137	.68	.58	50
12	783	58	41	126	36	79	17	5.3	94	.38	.25	27
13	582	63	34	93	38	68	14	4.1	63	.23	.62	16
14	461	125	39	86	57	67	11	3.8	44	.18	139	10
15	367	120	53	84	102	60	9.1	4.1	33	.14	326	9.2
16	306	116	63	86	212	48	9.7	5.3	118	.10	219	7.6
17	269	115	84	84	171	57	12	25	68	.07	65	7.5
18	259	104	91	81	116	67	12	7.1	35	.06	20	6.2
19	241	84	100	79	92	59	9.3	4.5	28	.19	5.7	4.9
20	228	68	96	80	79	54	10	3.6	17	10	3.0	4.0
21	218	66	91	81	68	49	8.6	2.9	99	.97	435	3.5
22	209	67	130	74	66	45	8.1	2.7	97	.29	1740	3.2
23	207	67	131	73	66	47	7.8	2.5	157	.20	565	3.9
24	195	66	100	75	71	44	6.7	2.1	63	.10	226	1560
25	173	68	84	75	74	44	5.9	3.2	41	.08	107	842
26	159	70	76	74	75	38	23	3.4	21	.09	68	264
27	148	68	67	72	70	33	259	5.9	12	.04	627	136
28	135	66	120	78	66	32	85	5.4	8.7	.02	1040	79
29	127	69	97	80	---	25	54	4.7	5.5	.00	280	417
30	114	52	93	81	---	22	37	4.3	3.7	.00	134	645
31	106	---	92	85	---	25	---	3.6	---	.00	94	---
TOTAL	7685.4	2259	2648	2402	2448	1653	807.2	219.7	3752.4	188.98	6137.16	5306.0
MEAN	248	75.3	85.4	77.5	87.4	53.3	26.9	7.09	125	6.10	198	177
MAX	1250	125	238	126	212	79	259	25	547	81	1740	1560
MIN	2.2	52	24	22	36	22	5.9	2.1	3.7	.00	.00	3.2
AC-FT	15240	4480	5250	4760	4860	3280	1600	436	7440	375	12170	10520
CAL YR 1985	TOTAL	46820.72		MEAN	128	MAX	2660	MIN	.21	AC-FT	92870	
WTR YR 1986	TOTAL	35506.84		MEAN	97.3	MAX	1740	MIN	.00	AC-FT	70430	

## ARKANSAS RIVER BASIN

07157950 CIMARRON RIVER NEAR BUFFALO, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1953, 1961-63, 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1968 to January 1982.

WATER TEMPERATURE: July 1968 to January 1982.

INSTRUMENTATION.--Water quality monitor from March 1969 to September 1979.

REMARKS.--Samples were collected quarterly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	
NOV 07...	1330	1028	80020	59	11000	8.00	18.0	12.0	--	718	10.2	
MAR 06...	1430	1028	80020	64	9320	8.20	23.0	16.5	5.8	716	9.8	
APR 30...	1730	1028	80020	38	17700	8.30	24.5	26.0	2.0	714	7.4	
AUG 14...	1715	1028	80020	123	20300	8.10	27.0	25.0	85	714	8.1	
DATE		OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS./ PER 100 ML)	HARD-NESS (MG/L AS CAC03)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
NOV 07...	105	44	--	800	600	210	68	2300	86	37	6.8	
MAR 06...	110	K4	K4	630	430	150	61	2000	87	36	6.8	
APR 30...	104	69	69	900	720	230	80	3800	90	57	8.9	
AUG 14...	112	5300	7900	1000	930	250	100	4400	90	61	7.2	
DATE		BICAR-BONATE IT-FLD (MG/L AS HC03)	CAR-BONATE IT-FLD (MG/L AS C03)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS-SOLVED (MG/L AS C02)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	
NOV 07...	252	0	207	4.0	480	4100	0.80	16	6670	7300		
MAR 06...	237	0	194	2.4	480	3000	0.80	14	5430	5800		
APR 30...	223	0	183	1.8	710	5700	0.60	16	11000	11000		
AUG 14...	124	0	102	1.6	350	7300	0.20	5.2	13600	12000		
DATE		SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N02)	NITRO-GEN, N02+N03 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	
NOV 07...	9.1	1060	--	<0.010	--	<0.100	0.090	0.100	0.13	0.11		
MAR 06...	7.4	934	--	<0.010	--	<0.100	0.060	0.060	0.08	0.44		
APR 30...	15.0	1120	--	<0.010	--	<0.100	0.110	0.090	0.12	0.39		
AUG 14...	18.5	4520	0.150	0.010	0.03	0.160	0.060	0.040	0.05	0.24		

## ARKANSAS RIVER BASIN

07157950 CIMARRON RIVER NEAR BUFFALO, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS P04)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)
NOV 07...	0.20	0.030	0.09	0.010	0.010	0.03	<10	5	200	--
MAR 06...	0.50	0.020	--	0.020	<0.010	--	10	2	200	<10
APR 30...	0.50	0.020	--	0.020	<0.010	--	--	--	--	--
AUG 14...	0.30	0.170	--	0.020	0.020	0.06	--	--	--	--
DATE	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)
NOV 07...	<1	<1	<1	<1	40	1	60	30	<0.1	4
MAR 06...	1	<1	2	2	20	<1	60	30	<0.1	7
APR 30...	--	--	--	--	--	--	--	--	--	--
AUG 14...	--	--	--	--	--	--	--	--	--	--
DATE	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	
NOV 07...	9	1	<1	--	44	20	41	6.5	67	
MAR 06...	2	2	<1	2400	44	20	39	6.7	41	
APR 30...	--	--	--	--	--	--	37	3.8	21	
AUG 14...	--	--	--	--	--	--	203	67	90	



## ARKANSAS RIVER BASIN

07157960 BUFFALO CREEK NEAR LOVEDALE, OK

LOCATION.--Lat 36°46'08", long 99°21'58", in NW 1/4 NW 1/4 sec.4, T.26 N., R.20 W., Harper County, Hydrologic Unit 11050001, near center of channel on downstream side of pier of bridge on State Highway 34, 1.2 mi east of Lovedale, 1.3 mi upstream from Sleeping Bear Creek, and at mile 7.6.

DRAINAGE AREA.--408 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,602.56 ft, Oklahoma State Highway Department datum.

REMARKS.--Estimated daily discharges: Nov. 29 to Dec. 3, 11-15, Jan. 8, 9, and Feb. 11, 12. Records fair, except for periods of estimated record, which are poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--20 years, 10.2 ft<sup>3</sup>/s, 7,390 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,800 ft<sup>3</sup>/s, Aug. 9, 1967, gage height, 14.80 ft, from rating curve extended above 7,000 ft<sup>3</sup>/s on basis of slope-area determination of peak flow; maximum gage height, 16.17 ft, May 10, 1979; no flow each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<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. 10	1045	*3,680	*12.41	No other peak greater than base discharge			
No flow July 28 to Aug. 8, and Sept. 25-28.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	33	11	10	8.2	7.4	6.0	9.7	6.3	3.0	.00	1.1
2	3.2	32	10	10	8.1	7.4	6.2	7.7	13	5.3	.00	1.1
3	3.9	28	11	9.8	8.4	7.4	6.5	6.4	23	2.6	.00	1.4
4	4.4	26	12	9.7	8.5	7.3	6.2	5.6	18	1.8	.00	1.5
5	4.5	22	13	9.1	8.3	7.3	6.1	5.1	13	1.4	.00	1.5
6	4.3	19	14	9.4	8.2	7.2	6.1	4.7	11	1.1	.00	1.2
7	4.1	18	14	8.8	8.4	7.0	6.3	4.0	14	1.3	.00	1.0
8	4.2	18	13	7.8	9.0	6.9	6.1	3.9	18	3.6	.00	.95
9	6.0	17	13	8.0	9.1	7.1	5.8	4.3	18	2.2	1.1	.78
10	2150	16	13	8.9	9.3	6.8	6.1	4.1	16	.97	1.1	.70
11	533	16	11	9.0	8.4	6.8	6.1	4.6	12	.79	1.5	.58
12	201	15	10	9.0	8.0	7.1	6.3	4.1	11	.65	.66	.45
13	117	15	9.6	9.0	9.6	7.1	6.2	3.5	9.8	.50	.42	.37
14	76	19	10	9.1	10	7.0	5.6	3.4	8.9	.37	3.1	.31
15	60	28	11	9.2	10	6.9	5.4	3.8	7.9	.28	3.0	.29
16	53	26	12	9.3	12	7.0	5.2	3.7	7.1	.20	6.4	.25
17	48	22	12	9.1	12	7.1	5.4	12	15	.13	3.2	.23
18	45	20	12	9.0	11	7.0	5.2	12	12	.09	1.5	.18
19	44	18	11	9.0	11	6.8	5.0	8.1	9.6	.07	.91	.12
20	42	16	11	9.0	10	6.6	4.9	6.3	9.2	.51	.65	.09
21	40	15	11	8.5	9.1	6.6	4.6	5.4	8.4	.40	.80	.05
22	39	15	11	8.1	8.9	6.5	4.5	4.9	6.8	.35	3.0	.02
23	38	15	11	8.3	8.7	6.5	4.4	4.5	5.3	.27	7.2	.02
24	36	14	11	8.4	8.5	6.5	4.1	4.3	4.7	.14	5.6	.01
25	35	14	10	8.2	8.8	6.3	3.9	9.1	3.9	.07	2.6	.00
26	35	14	11	7.9	8.4	6.1	4.0	15	3.2	.06	1.5	.00
27	34	13	11	7.9	7.9	5.9	194	10	2.7	.03	1.5	.00
28	34	13	11	8.1	7.3	5.9	58	8.5	2.6	.00	1.2	.00
29	34	12	10	8.2	---	5.9	20	7.3	2.2	.00	1.1	.20
30	33	11	10	8.2	---	6.0	14	6.7	1.8	.00	.85	3.4
31	33	---	10	8.2	---	6.0	---	6.0	---	.00	.94	---
TOTAL	3797.6	560	350.6	272.2	255.1	209.4	428.2	198.7	294.4	28.18	49.83	17.80
MEAN	123	18.7	11.3	8.78	9.11	6.75	14.3	6.41	9.81	.91	1.61	.59
MAX	2150	33	14	10	12	7.4	194	15	23	5.3	7.2	3.4
MIN	3.0	11	9.6	7.8	7.3	5.9	3.9	3.4	1.8	.00	.00	.00
AC-FT	7530	1110	695	540	506	415	849	394	584	56	99	35

CAL YR 1985 TOTAL 9123.56 MEAN 25.0 MAX 2150 MIN .00 AC-FT 18100  
WTR YR 1986 TOTAL 6461.92 MEAN 17.7 MAX 2150 MIN .00 AC-FT 12820

## 07158000 CIMARRON RIVER NEAR WAYNOKA, OK

LOCATION.--Lat 36°31'02", long 98°52'45", in NW 1/4 NE 1/4 sec.35, T.24 N., R.16 W., Woods County, Hydrologic Unit 11050001, near left bank on downstream side of bridge on U.S. Highway 281, 4 mi south of Waynoka, and at mile 247.0.

DRAINAGE AREA.--13,334 mi<sup>2</sup>, of which 4,830 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--September 1903 to December 1905 (gage heights and discharge measurements only), October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311.

GAGE.--Water-stage recorder. Datum of gage is 1,367.35 ft, National Geodetic Vertical Datum of 1929.

September 1903 to December 1905, nonrecording gage at the Atchison, Topeka and Santa Fe Railway Co. bridge 5 mi upstream at different datum. Feb. 4 to Mar. 3, 1938, nonrecording gage and Mar. 4, 1938, to Oct. 24, 1956, water-stage recorder, on former highway bridge 50 ft downstream at present datum.

REMARKS.--Estimated daily discharges: Oct. 1, Dec. 1-5, 13, 14, and Feb. 11-13. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Extensive diversions for irrigation above station.

AVERAGE DISCHARGE.--49 years, (water years 1938-86), 317 ft<sup>3</sup>/s, 229,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 94,500 ft<sup>3</sup>/s, May 16, 1957, gage height, 15.10 ft, from rating curve extended above 45,000 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of about 14 ft occurred probably in 1914.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 10,000 ft<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. 10	1530	*16,700	*9.83	No other peak greater than base discharge			
No flow at times.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	94	127	112	157	149	112	72	51	33	45	.00	136
2	68	118	84	154	154	116	104	38	128	45	.00	118
3	49	110	92	149	160	115	81	26	594	22	.00	109
4	36	101	118	147	166	114	71	20	412	6.9	.00	125
5	25	97	209	145	168	113	66	15	255	2.8	.00	151
6	17	95	287	140	167	112	63	13	228	6.9	.00	198
7	12	90	257	155	170	106	208	9.4	255	25	.00	154
8	12	95	252	149	178	102	111	12	272	13	.00	131
9	64	99	281	144	183	107	62	13	202	3.0	.00	121
10	9180	101	313	137	183	105	53	24	278	.99	200	109
11	2940	101	285	148	160	104	51	76	274	.28	87	102
12	1370	106	228	158	131	126	50	52	181	.00	16	86
13	871	113	154	173	105	159	50	26	145	.00	1.3	79
14	713	262	144	172	152	137	45	33	102	.00	163	69
15	531	733	163	167	174	126	39	64	72	.00	698	64
16	424	423	190	161	202	128	37	47	72	.00	390	63
17	357	356	207	158	212	122	37	167	44	.00	267	60
18	346	335	216	157	232	121	37	158	90	.00	177	57
19	325	314	216	151	193	117	36	94	63	.00	138	31
20	286	277	203	149	166	114	34	66	40	.00	115	15
21	264	256	203	148	147	107	32	48	27	.00	103	10
22	248	251	196	147	142	104	30	35	24	.00	153	7.8
23	224	251	197	145	142	97	28	27	59	.00	968	5.6
24	208	246	201	149	137	89	25	32	148	.00	394	4.4
25	186	245	194	149	133	86	21	33	76	.00	225	403
26	176	253	180	146	132	81	17	33	36	.00	142	519
27	171	251	170	146	121	78	28	59	22	.00	110	276
28	163	241	168	149	112	76	273	71	29	.00	183	185
29	155	236	165	154	---	71	143	66	16	.00	544	165
30	142	250	168	152	---	68	77	52	5.5	.00	229	311
31	130	---	161	152	---	67	---	42	---	.00	157	---
TOTAL	19787	6533	6014	4708	4471	3280	1981	1502.4	4182.5	170.87	5460.30	3864.8
MEAN	638	218	194	152	160	106	66.0	48.5	139	5.51	176	129
MAX	9180	733	313	173	232	159	273	167	594	45	968	519
MIN	12	90	84	137	105	67	17	9.4	5.5	.00	.00	4.4
AC-FT	39250	12960	11930	9340	8870	6510	3930	2980	8300	339	10830	7670

CAL YR 1985 TOTAL 81115.48 MEAN 222 MAX 9180 MIN .00 AC-FT 160900  
WTR YR 1986 TOTAL 61954.84 MEAN 170 MAX 9180 MIN .00 AC-FT 122900

## ARKANSAS RIVER BASIN

07159100 CIMARRON RIVER NEAR DOVER, OK

LOCATION.--Lat 35°57'06", long 97°54'51", in SW 1/4 NE 1/4 sec.14, T.17 N., R.7 W., Kingfisher County, Hydrologic Unit 11050002, near right bank on downstream bridge on U.S. Highway 81, 1.0 mi downstream from Turkey Creek, 2.0 mi south of Dover, 2.5 mi upstream from Kingfisher Creek, and at mile 160.6.

DRAINAGE AREA.--15,713 mi<sup>2</sup>, of which 4,926 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1973 to current year.

GAGE.--Water-stage recorder. Datum of gage is 999.19 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 6, Dec. 1-4, 13-15, and Feb. 10-12. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--13 years, 723 ft<sup>3</sup>/s, 523,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 68,900 ft<sup>3</sup>/s, May 17, 1982, gage height, 22.87 ft from high-water mark; minimum daily, 4.3 ft<sup>3</sup>/s, Sept. 23, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 12,000 ft<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. 11	Unknown	16,900	17.20	Sept. 30	1630	*38,700	*20.66
Nov. 15	1330	14,400	16.76				

Minimum daily discharge, 41 ft<sup>3</sup>/s, Aug. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1280	412	400	359	267	294	193	360	217	527	43	576
2	959	401	370	367	272	294	234	306	206	773	41	390
3	760	385	380	363	272	284	350	229	279	503	45	307
4	637	368	400	347	263	284	327	176	1380	533	193	262
5	533	353	418	344	272	282	275	144	5140	418	275	288
6	418	353	453	338	272	282	260	132	2840	340	222	248
7	338	343	495	334	276	272	228	126	1810	3680	193	208
8	299	333	508	318	281	274	209	126	1240	1530	259	209
9	285	328	441	315	290	269	207	126	1690	796	177	251
10	420	323	429	322	280	263	345	151	1220	686	147	226
11	12500	323	441	313	270	273	331	276	1070	345	345	199
12	9990	318	502	304	280	252	273	179	869	239	911	221
13	4490	313	480	299	308	260	238	132	809	196	399	172
14	4950	622	450	299	328	268	200	154	1210	161	897	149
15	3220	11300	460	299	338	272	190	189	5020	140	2880	147
16	2540	7710	489	308	328	312	180	203	4920	122	6680	144
17	1570	3770	464	308	328	316	183	659	3100	105	4100	141
18	6760	1660	427	313	338	292	180	1080	1670	93	1490	127
19	3430	1080	411	318	333	312	162	878	805	84	768	115
20	1340	914	407	318	343	344	161	819	598	77	520	105
21	1040	768	412	304	348	338	158	463	523	74	397	95
22	869	630	418	304	353	308	151	337	514	83	405	89
23	793	580	425	294	333	295	146	251	665	80	390	85
24	736	560	503	290	308	281	140	222	3810	119	271	77
25	705	547	466	290	304	271	134	464	2620	104	555	75
26	637	534	414	281	307	274	134	414	1410	85	735	78
27	580	520	419	281	316	266	158	413	793	68	455	72
28	547	471	397	281	307	242	192	288	591	58	354	221
29	501	447	373	272	---	228	177	215	458	51	273	9460
30	447	424	372	272	---	215	138	199	390	46	231	29200
31	429	---	334	267	---	208	---	208	---	43	379	---
TOTAL	64003	37090	13358	9622	8515	8625	6254	9919	47867	12159	25030	43937
MEAN	2065	1236	431	310	304	278	208	320	1596	392	807	1465
MAX	12500	11300	508	367	353	344	350	1080	5140	3680	6680	29200
MIN	285	313	334	267	263	208	134	126	206	43	41	72
AC-FT	126900	73570	26500	19090	16890	17110	12400	19670	94940	24120	49650	87150

CAL YR 1985 TOTAL 246376 MEAN 675 MAX 12500 MIN 29 AC-FT 488700  
WTR YR 1986 TOTAL 286379 MEAN 785 MAX 29200 MIN 41 AC-FT 568000

ARKANSAS RIVER BASIN

51

07159720 COTTONWOOD CREEK NEAR NAVINA, OK

LOCATION.--Lat 35°46'36", long 97°32'45", SW 1/4 NW 1/4 sec.17, T.15 N., R.4 W., Logan County, Hydrologic Unit 11050002 on downstream right bank, 0.5 mi downstream from Deer Creek, 1.7 mi southeast of Navina, 10.7 mi southwest of Guthrie, and at mile 25.0.

DRAINAGE AREA.--247 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1977 to September 1980, March 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is 962.10 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 15. Records fair. Low flow sustained in part by sewage effluent.

AVERAGE DISCHARGE.--7 years (water years 1978-80, 1983-86), 114 ft<sup>3</sup>/s, 82,590 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,000 ft<sup>3</sup>/s, Oct. 20, 1983, gage height, 23.94 ft; minimum daily discharge, 8.0 ft<sup>3</sup>/s, Oct. 14, 15, 1977.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base discharge of 2,000 ft<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. 19	0200	3,740	20.56	May 17	0300	5,670	21.42
May 11	1600	2,180	19.19	Sept. 29	1400	*14,500	*22.89
May 15	1300	5,080	21.19				

Minimum daily discharge, 27 ft<sup>3</sup>/s, Mar. 1, and May 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	231	66	78	59	39	27	33	37	96	54	28	33
2	149	59	76	93	40	28	39	31	146	60	28	54
3	132	56	67	92	43	29	181	30	272	55	29	51
4	124	60	66	75	42	28	292	29	143	52	29	49
5	107	56	65	67	40	30	100	29	109	48	51	47
6	94	48	66	69	38	29	64	30	105	48	91	43
7	91	45	66	55	37	29	51	27	126	47	44	71
8	88	45	65	52	43	28	46	36	176	47	55	51
9	57	48	60	42	47	30	39	1430	98	45	72	49
10	50	49	57	42	42	33	37	900	103	43	49	49
11	178	47	59	44	40	32	36	1790	691	42	42	55
12	97	48	61	42	42	46	36	427	167	42	37	47
13	109	60	56	40	46	43	37	152	97	41	35	44
14	279	214	55	43	43	39	38	668	77	40	34	41
15	427	695	65	40	44	36	33	4270	674	40	56	48
16	353	376	66	39	46	36	31	1660	447	38	81	47
17	261	188	64	40	45	37	31	3020	678	38	45	52
18	2010	155	62	39	42	43	31	3310	262	38	39	54
19	2460	213	57	40	40	52	32	675	179	36	34	47
20	550	132	58	39	35	42	112	402	140	36	34	47
21	358	99	55	42	34	38	58	293	116	36	35	41
22	280	92	58	40	34	34	39	233	99	41	34	37
23	256	85	58	35	36	36	34	195	130	50	32	40
24	237	80	53	37	37	35	35	165	102	37	32	40
25	245	76	48	38	31	33	32	148	82	33	32	42
26	345	94	47	38	30	33	30	134	77	32	33	39
27	125	150	52	38	30	33	34	150	69	34	32	49
28	97	115	48	39	29	33	108	133	62	33	35	56
29	88	77	48	38	---	32	46	113	58	31	34	2740
30	83	70	48	38	---	34	37	100	55	28	33	5510
31	81	---	48	38	---	33	---	98	---	29	33	---
TOTAL	10042	3598	1832	1473	1095	1071	1752	20715	5636	1274	1278	9573
MEAN	324	120	59.1	47.5	39.1	34.5	58.4	668	188	41.1	41.2	319
MAX	2460	695	78	93	47	52	292	4270	691	60	91	5510
MIN	50	45	47	35	29	27	30	27	55	28	28	33
AC-FT	19920	7140	3630	2920	2170	2120	3480	41090	11180	2530	2530	18990
CAL YR 1985	TOTAL 75572	MEAN 207	MAX 3040	MIN 18	AC-FT 149900							
WTR YR 1986	TOTAL 59339	MEAN 163	MAX 5510	MIN 27	AC-FT 117700							

## ARKANSAS RIVER BASIN

07159720 COTTONWOOD CREEK NEAR NAVINA, OK--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1977 to November 1980.

WATER TEMPERATURE: October 1977 to November 1980.

REMARKS.--Samples collected monthly. Specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)
OCT										
17...	1300	1028	80020	9.46	261	633	7.40	23.0	17.5	140
NOV										
27...	1505	1028	80020	8.29	155	1030	7.80	0.0	7.0	52
DEC										
30...	1350	1028	80020	6.60	50	*1430	7.60	15.0	8.0	4.9
JAN										
15...	1125	1028	80020	6.36	40	1460	7.40	15.0	5.5	4.0
MAR										
21...	1200	1028	80020	6.08	40	1440	7.70	18.0	10.5	12
31...	1200	1028	80020	5.94	35	1390	7.50	21.0	18.0	39
MAY										
15...	1730	1028	80020	20.97	4560	320	7.00	27.0	21.0	330
JUN										
19...	1000	1028	80020	8.33	185	754	7.10	26.0	23.0	87
JUL										
24...	1100	1028	80020	5.67	37	1060	7.20	28.0	25.5	80
AUG										
26...	1000	1028	80020	5.60	33	*1230	7.60	26.0	25.0	50
SEP										
29...	1330	1028	80020	18.16	1590	254	6.80	24.0	23.5	1200

DATE	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM
OCT 17...	740	8.0	86	210	58	53	20	49	33
NOV 27...	740	10.2	87	350	130	86	34	81	33
DEC 30...	727	11.6	103	460	170	110	46	130	38
JAN 15...	740	12.6	103	460	150	110	44	130	38
MAR 21...	749	9.2	84	400	180	99	38	110	37
31...	730	7.9	88	460	120	110	45	150	41
MAY 15...	729	8.0	94	98	0	25	8.6	19	29
JUN 19...	740	6.5	78	300	58	73	28	67	32
JUL 24...	730	7.1	91	320	110	79	31	110	42
AUG 26...	740	6.8	85	360	140	88	33	130	43
SEP 29...	730	8.0	99	69	19	18	5.8	21	38

\* SPECIFIC CONDUCTANCE, LAB (US/CM)



## ARKANSAS RIVER BASIN

53

07159720 COTTONWOOD CREEK NEAR NAVINA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
OCT 17...	2	3.8	192	0	157	12	100	55	387
NOV 27...	2	3.5	280	0	229	7.1	180	79	634
DEC 30...	3	4.5	355	0	291	14	240	140	902
JAN 15...	3	5.4	370	0	305	23	260	150	928
MAR 21...	2	5.9	272	0	223	8.6	230	130	832
31...	3	6.5	412	0	338	21	280	170	987
MAY 15...	0.9	4.6	150	0	123	24	45	9.4	181
JUN 19...	2	5.4	293	0	240	37	140	66	555
JUL 24...	3	7.9	256	0	210	26	180	140	746
AUG 26...	3	9.8	259	0	212	10	190	150	800
SEP 29...	1	4.4	61	0	50	15	27	15	216

## ARKANSAS RIVER BASIN

07160000 CIMARRON RIVER NEAR GUTHRIE, OK

LOCATION.--Lat 35°55'07", long 97°25'34", near center of east line of sec.29, T.17 N., R.2 W, Logan County, Hydrologic Unit 11050002, on downstream side of second pier from left bank of State Highway 77 bridge, 1.6 mi downstream from Cottonwood Creek, 2.5 mi north of Guthrie, 6.1 mi upstream from Skeleton Creek, and at mile 122.4.

DRAINAGE AREA.--16,892 mi<sup>2</sup>, of which 4,926 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1937-76, October 1983 to current year. Monthly discharge only for some periods, published in WSP's 1311 and 1731.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 896.50 ft above mean sea level (U.S. Army Corps of Engineers' benchmark). Prior to Mar. 19, 1939, nonrecording gage at railway bridge 1,200 ft upstream at datum 4.00 ft higher. From Mar. 19, 1939 to Sept. 30, 1976, recording gage 125 ft upstream from railway bridge at datum 4.00 ft higher. From Sept. 14, 1967 to Sept. 30, 1976, supplementary water-stage recorder at present site and datum.

REMARKS.--Estimated daily discharges: Oct. 1, 5-10, 19-31, Nov. 16-20, Dec. 1 to Jan. 20, Jan. 22 to Feb. 3, Mar. 27 to Apr. 1, 23-27, May 1, 10-21, June 5-12, 29, July 14-15, July 30 to Aug. 4, and Aug. 31 to Sept. 1, 6-28. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--42 years (water years 1938-76, 1984-86), 892 ft<sup>3</sup>/s, 646,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 158,000 ft<sup>3</sup>/s, May 17, 1957, gage height, 18.58 ft, site and datum then in use; minimum discharge, 0.1 ft<sup>3</sup>/s, Nov. 2, 1939.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base discharge of 16,000 ft<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)
Sept. 30	1830	*43,600	*13.76	Stage rising, peak occurred Oct. 1, 1986. No other known peak greater than base discharge.			

Minimum daily discharge, 149 ft<sup>3</sup>/s, Aug. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1500	605	700	540	485	407	260	300	757	476	162	295
2	1360	549	640	550	480	395	393	315	686	483	154	493
3	1240	527	610	560	475	389	605	416	733	651	150	415
4	1170	507	590	540	482	382	1060	346	911	511	149	349
5	1050	500	630	530	478	373	769	324	2100	455	251	321
6	980	491	670	520	476	367	545	315	4600	418	416	310
7	930	487	719	510	480	366	477	303	2400	384	394	360
8	900	484	723	505	507	355	442	319	1600	2000	311	315
9	890	482	724	500	518	347	386	1260	1300	1240	304	288
10	860	482	703	495	533	352	357	3920	1650	726	307	300
11	2030	482	660	505	535	354	383	2380	1200	729	273	280
12	7000	485	680	495	524	370	464	1790	1000	489	263	260
13	4500	657	710	490	526	390	396	1000	920	394	604	275
14	3680	861	700	485	548	383	376	886	811	307	442	262
15	4800	1200	680	490	532	382	333	1500	828	275	576	245
16	4240	7400	690	498	537	379	326	6200	905	262	2010	228
17	2910	5000	700	500	512	406	328	4490	919	235	4270	220
18	4110	3000	670	505	508	424	329	3610	912	220	2360	210
19	5500	1700	630	510	511	432	332	2940	1400	206	1150	200
20	3970	1350	620	515	517	421	346	2260	1440	201	722	193
21	2750	1220	610	518	520	409	400	1730	1190	198	555	182
22	2000	1070	620	510	528	408	334	1230	975	214	466	169
23	1600	956	640	500	500	376	320	955	870	275	427	162
24	1300	855	680	498	480	355	300	791	861	261	438	160
25	1100	810	710	490	466	333	290	725	2430	239	366	158
26	1000	792	680	488	444	323	280	1020	1820	227	350	152
27	900	776	690	490	426	318	275	889	1200	215	614	150
28	820	774	660	492	417	300	388	852	791	205	446	151
29	750	764	640	491	---	280	478	733	648	201	371	9080
30	700	757	620	490	---	270	370	701	551	188	332	37200
31	650	---	590	490	---	265	---	678	---	175	312	---
TOTAL	67190	36023	20589	15700	13945	11311	12342	45178	38408	13060	19945	53383
MEAN	2167	1201	664	506	498	365	411	1457	1280	421	643	1779
MAX	7000	7400	724	560	548	432	1060	6200	4600	2000	4270	37200
MIN	650	482	590	485	417	265	260	300	551	175	149	150
AC-FT	133300	71450	40840	31140	27660	22440	24480	89610	76180	25900	39560	105900

CAL YR 1985 TOTAL 438714 MEAN 1202 MAX 14900 MIN 54 AC-FT 870200  
WTR YR 1986 TOTAL 347074 MEAN 951 MAX 37200 MIN 149 AC-FT 688400

## ARKANSAS RIVER BASIN

55

## 07160500 SKELETON CREEK NEAR LOVELL, OK

LOCATION.--Lat 36°03'36", long 97°35'05", in NW 1/4 SW 1/4 sec.1, T.18 N., R.4 W., Logan County, Hydrologic Unit 11050002, near right bank on downstream side of pier of bridge on State Highway 74, 2 mi upstream from Otter Creek, 2.8 mi east of Lovell, and at mile 14.6.

DRAINAGE AREA.--410 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 909.76 ft, Oklahoma State Highway Department datum. Prior to Dec. 5, 1949, nonrecording gage at site 60 ft downstream at datum 4.70 ft higher. Prior to Oct. 1, 1979, gage at present site and datum 5.00 ft higher.

REMARKS.--Estimated daily discharges: Oct. 5-10, 13-18, 20-29, Feb. 25-26, Mar. 30, and July 17-22. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--37 years, 118 ft<sup>3</sup>/s, 85,490 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 75,200 ft<sup>3</sup>/s, May 16, 1957, gage height, 34.58 ft, at datum then in use; no flow at times in 1953-54, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,300 ft<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. 19	---	2,770	19.00 (HWM)	Sept. 30	1300	*30,300	*34.75
Nov. 16	0930	2,450	17.68				

Minimum daily discharge, 1.1 ft<sup>3</sup>/s, July 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	245	44	80	52	22	14	28	13	121	65	5.0	3.6
2	37	42	61	49	28	16	44	11	186	78	6.9	5.0
3	9.1	41	70	47	29	17	224	9.9	371	71	6.5	4.4
4	6.2	36	79	46	29	17	155	8.5	1400	30	9.0	5.4
5	5.0	37	79	42	26	14	96	9.2	1270	19	8.0	5.8
6	4.0	32	79	41	20	17	70	9.3	485	15	273	14
7	3.5	39	80	40	27	17	57	7.6	313	382	76	18
8	3.0	36	77	37	31	17	53	7.9	619	1170	97	5.9
9	2.5	34	73	31	36	17	48	8.6	219	87	115	4.2
10	2.9	28	71	45	27	14	34	16	202	15	71	2.8
11	9.9	33	72	47	28	14	39	416	367	5.7	145	2.9
12	21	91	69	40	29	16	38	176	117	3.1	38	3.8
13	34	76	62	40	35	22	32	53	62	2.8	14	3.4
14	50	99	64	36	43	24	34	22	41	62	83	2.5
15	120	1380	70	36	42	20	44	47	586	17	1300	1.2
16	50	2020	76	38	34	21	26	54	866	3.2	571	1.9
17	25	353	73	36	29	18	18	626	1650	2.5	158	3.3
18	300	214	64	36	25	20	25	954	500	2.0	55	4.5
19	1000	170	63	28	22	22	22	176	161	1.6	24	2.5
20	700	136	62	34	21	20	18	76	108	1.4	14	2.7
21	500	119	61	35	23	16	15	45	89	1.2	8.9	2.4
22	300	112	63	33	17	15	14	27	64	1.1	19	1.3
23	200	107	66	25	22	13	11	16	51	455	41	1.5
24	150	103	60	28	21	15	9.9	18	695	279	9.8	1.9
25	100	98	61	29	21	13	12	14	197	28	7.6	1.3
26	80	99	50	29	21	11	10	11	98	27	6.1	3.4
27	70	97	53	27	20	14	25	28	68	14	3.8	4.1
28	60	89	54	24	17	14	78	52	44	9.5	4.6	2.3
29	56	83	50	25	---	13	60	36	34	9.1	5.8	2110
30	52	81	48	26	---	12	26	18	25	6.7	4.4	21100
31	46	---	49	24	---	25	---	14	---	6.8	2.7	---
TOTAL	4242.1	5929	2039	1106	745	518	1365.9	2980.0	11009	2870.7	3183.1	23326.0
MEAN	137	198	65.8	35.7	26.6	16.7	45.5	96.1	367	92.6	103	778
MAX	1000	2020	80	52	43	25	224	954	1650	1170	1300	21100
MIN	2.5	28	48	24	17	11	9.9	7.6	25	1.1	2.7	1.2
AC-FT	8410	11760	4040	2190	1480	1030	2710	5910	21840	5690	6310	46270

CAL YR 1985 TOTAL 44712.6 MEAN 123 MAX 2020 MIN 2.5 AC-FT 88690  
WTR YR 1986 TOTAL 59313.7 MEAN 163 MAX 21100 MIN 1.1 AC-FT 117600

## 07161000 CIMARRON RIVER AT PERKINS, OK

LOCATION.--Lat 35°57'32", long 97°01'49", in SW 1/4 SW 1/4 sec.7, T.17 N., R.3 E., Payne County, Hydrologic Unit 11050003, near right bank at downstream side of bridge on U.S. Highway 177, 1.0 mi south of Perkins, 1.5 mi upstream from Dugout Creek, 4.0 mi downstream from Wildhorse Creek, and at mile 87.3.

DRAINAGE AREA.--17,852 mi<sup>2</sup> of which 4,962 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1939 to current year. Monthly discharge only for some periods, published in WSP 1311. Gage-height records collected at same site since 1927 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 814.88 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to June 26, 1940 and Jan. 9 to Apr. 7, 1957, nonrecording gage at same site and datum 5.00 ft higher. Prior to Oct. 1, 1977, at same site and datum 5.00 ft higher.

REMARKS.--No estimated daily discharge. Records fair.

AVERAGE DISCHARGE.--47 years, 1,200 ft<sup>3</sup>/s, 869,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 149,000 ft<sup>3</sup>/s, May 17, 1957, gage height, 19.53 ft, datum then in use; minimum discharge, 0.8 ft<sup>3</sup>/s, Dec. 8, 1954.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 4, 5, 1926, reached a stage of 17.0 ft from floodmarks, information by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, stage rising, peak occurred on Oct. 1, 1986. Peak discharges greater than base discharge of 16,000 ft<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. 20	--	22,100	15.47	May 19	0100	16,000	14.49
Nov. 16	2000	16,200	14.52	Sept. 30	2400	*78,800	--

Minimum daily discharge, 132 ft<sup>3</sup>/s, Aug. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4450	959	1120	622	622	520	425	442	769	776	150	433
2	3130	814	1200	608	600	520	557	348	1820	751	149	438
3	1890	882	1030	633	616	447	1720	324	1260	724	135	766
4	1520	774	758	676	622	447	2780	425	1590	916	132	677
5	1230	814	859	676	622	438	1600	362	3580	692	170	555
6	1080	797	1000	669	627	433	1220	305	3730	570	239	480
7	983	763	999	658	627	433	848	276	4330	528	773	459
8	900	741	959	639	655	420	639	270	2560	805	723	470
9	848	724	956	627	667	429	520	806	2640	3920	585	419
10	831	667	941	625	667	425	495	2330	1880	1590	805	361
11	848	667	917	616	694	433	447	4100	1950	1080	559	362
12	1570	741	886	632	689	456	407	4360	2510	999	528	361
13	6550	1200	885	627	689	451	541	2900	1800	688	349	244
14	5140	2240	996	623	684	451	505	1990	1320	516	833	314
15	4220	3940	855	616	684	442	412	4120	1200	462	798	406
16	7870	12700	759	616	678	447	369	6440	5890	421	2990	312
17	4450	9990	825	623	678	460	357	10700	8190	334	3770	284
18	7600	5490	879	634	673	495	433	11900	11900	299	4090	273
19	17200	3510	853	643	683	447	386	11500	3960	271	2380	262
20	19100	2510	805	650	695	470	382	4080	2520	257	1580	259
21	4450	2040	792	659	672	460	349	2950	1900	240	1130	245
22	3080	1730	774	644	669	447	420	2260	1570	237	894	226
23	2340	1570	762	627	667	416	341	1750	1510	272	742	208
24	2000	1420	769	633	661	412	316	1390	1320	1060	723	191
25	1730	1330	754	622	627	399	285	1170	2110	867	698	196
26	1570	1310	811	595	600	382	274	1040	2990	330	559	197
27	1630	1250	781	578	562	341	278	1370	2150	267	513	187
28	1350	1220	717	600	541	341	305	1220	1560	229	932	175
29	1200	1190	707	589	---	332	349	1120	1110	198	708	7070
30	1120	1130	685	578	---	328	622	975	874	178	579	57400
31	1040	---	643	616	---	316	---	850	---	154	479	---
TOTAL	112920	65113	26677	19454	18171	13238	18582	84073	82493	20631	29695	74230
MEAN	3643	2170	861	628	649	427	619	2712	2750	666	958	2474
MAX	19100	12700	1200	676	695	520	2780	11900	11900	3920	4090	57400
MIN	831	667	643	578	541	316	274	270	769	154	132	175
AC-FT	224000	129200	52910	38590	36040	26260	36860	166800	163600	40920	58900	147200

CAL YR 1985 TOTAL 664312 MEAN 1820 MAX 19100 MIN 95 AC-FT 1318000  
WTR YR 1986 TOTAL 565277 MEAN 1549 MAX 57400 MIN 132 AC-FT 1121000

## ARKANSAS RIVER BASIN

07161000 CIMARRON RIVER AT PERKINS, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 1953-63, 1965 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1952 to September 1963, June 1965 to January 1982.

WATER TEMPERATURE: October 1962 to September, 1963, June 1965 to January 1982.

INSTRUMENTATION.--Water-quality monitor from April 1969 to September 1980.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)
NOV 25...	1400	1028	80020	8.37	1340	7780	8.20	21.0	11.0	44	730
DEC 23...	1600	1028	1028	7.84	747	11500	8.00	16.0	6.0	--	--
JAN 31...	1045	1028	80020	7.64	627	*9730	8.30	18.5	11.5	10	750
MAR 26...	1415	1028	80020	7.56	398	11100	8.90	24.0	20.0	0.40	750
APR 30...	1245	1028	1028	7.82	555	7700	8.70	26.0	24.0	--	--
MAY 28...	1400	1028	80020	8.53	1200	4200	8.60	28.0	24.0	150	735
JUL 16...	1400	1028	80020	7.60	392	*4110	8.40	33.0	31.5	75	740
AUG 19...	1610	1028	1028	9.51	2220	8300	8.10	33.0	28.0	--	--
SEP 29...	1315	1028	80020	9.24	1900	2660	7.80	27.0	21.0	1000	740
DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS./ PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
NOV 25...	10.2	99	220	170	640	400	160	58	1700	85	30
DEC 23...	--	--	--	--	--	--	--	--	--	--	--
JAN 31...	12.8	123	K7	K5	1300	1000	230	170	1900	76	24
MAR 26...	11.0	128	K3	K8	760	540	180	74	2400	87	39
APR 30...	--	--	--	--	--	--	--	--	--	--	--
MAY 28...	8.9	111	360	65	370	150	100	30	700	80	16
JUL 16...	12.0	--	K5	K5	400	230	97	38	710	79	16
AUG 19...	--	--	--	--	--	--	--	--	--	--	--
SEP 29...	7.3	85	--	--	180	92	44	17	490	85	16

\* SPECIFIC CONDUCTANCE, LAB (US/CM)



07161000 CIMARRON RIVER AT PERKINS, OK--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HC03)	CAR- BONATE IT-FLD (MG/L AS C03)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
NOV 25...	6.6	292	0	239	2.9	460	2500	0.40	13	4890	5100
DEC 23...	--	--	--	--	--	--	--	--	--	--	--
JAN 31...	5.1	285	0	234	2.3	790	3000	0.30	5.4	5690	6200
MAR 26...	6.4	224	20	217	0.4	680	3600	0.50	1.8	6660	7100
APR 30...	--	--	--	--	--	--	--	--	--	--	--
MAY 28...	6.3	244	15	224	1.0	--	1100	0.30	9.5	2240	2200
JUL 16...	7.9	--	--	--	1.3	250	1100	0.30	9.1	2400	2300
AUG 19...	--	--	--	--	--	--	--	--	--	--	--
SEP 29...	5.1	107	0	88	2.7	110	720	0.40	3.6	1620	1400

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N03)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N02)	NITRO- GEN, N02+N03 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N04)
NOV 25...	6.7	17700	1.28	5.8	0.020	0.07	1.30	0.240	0.170	0.22
DEC 23...	--	--	--	--	--	--	--	--	--	--
JAN 31...	7.7	9630	0.730	--	0.020	0.07	0.750	0.110	0.120	0.15
MAR 26...	9.1	7160	--	--	<0.010	--	<0.100	0.110	0.100	0.13
APR 30...	--	--	--	--	--	--	--	--	--	--
MAY 28...	3.0	7280	0.630	--	0.010	0.03	0.640	0.100	0.070	0.09
JUL 16...	3.3	2540	--	--	<0.010	--	<0.100	0.090	0.060	0.08
AUG 19...	--	--	--	--	--	--	--	--	--	--
SEP 29...	2.2	8310	0.350	--	0.020	0.07	0.370	0.700	0.190	0.24

DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS P04)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
NOV 25...	0.36	0.60	0.260	0.80	0.240	0.170	0.52	20	3	200
DEC 23...	--	--	--	--	--	--	--	--	--	--
JAN 31...	0.89	1.0	0.300	--	0.170	0.160	0.49	--	--	--
MAR 26...	1.2	1.3	0.270	--	0.080	0.070	0.21	<10	4	500
APR 30...	--	--	--	--	--	--	--	--	--	--
MAY 28...	1.3	1.4	0.400	--	0.180	0.160	0.49	--	--	--
JUL 16...	1.7	1.8	0.260	--	0.090	0.080	0.25	<10	6	200
AUG 19...	--	--	--	--	--	--	--	--	--	--
SEP 29...	0.60	1.3	0.230	--	0.200	0.190	0.58	--	--	--

ARKANSAS RIVER BASIN

59

07161000 CIMARRON RIVER AT PERKINS, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
NOV 25...	10	2	2	2	4	30	1	30	20	0.3
DEC 23...	--	--	--	--	--	--	--	--	--	--
JAN 31...	--	--	--	--	--	--	--	--	--	--
MAR 26...	<10	1	<1	<1	1	20	<1	50	50	<0.1
APR 30...	--	--	--	--	--	--	--	--	--	--
MAY 28...	--	--	--	--	--	--	--	--	--	--
JUL 16...	2	18	<1	<9	7	12	<5	41	3	<0.1
AUG 19...	--	--	--	--	--	--	--	--	--	--
SEP 29...	--	--	--	--	--	--	--	--	--	--

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SED. SUSP. CHARGE, SUS- PENDE (T/DAY)	SED. SIEVE DIAM. % FINER THAN .062 MM
NOV 25...	1	5	2	1	2100	38	10	187	677	55
DEC 23...	--	--	--	--	--	--	--	--	--	--
JAN 31...	--	--	--	--	--	--	--	--	--	--
MAR 26...	4	<1	2	<1	2500	53	20	36	39	60
APR 30...	--	--	--	--	--	--	--	--	--	--
MAY 28...	--	--	--	--	--	--	--	244	793	97
JUL 16...	<30	12	1	<1	1100	<18	16	92	97	94
AUG 19...	--	--	--	--	--	--	--	--	--	--
SEP 29...	--	--	--	--	--	--	--	1780	9130	91

## ARKANSAS RIVER BASIN

07163000 COUNCIL CREEK NEAR STILLWATER, OK

LOCATION.--Lat 36°06'58", long 96°52'03", in NW 1/4 NE 1/4 sec.22, T.19 N., R.4 E., Payne County, Hydrologic Unit 11050003, on right bank downstream side of bridge on State Highway 51, 10.0 mi east of Stillwater, and at mile 10.0.

DRAINAGE AREA.--31 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1934 to current year.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 828.28 ft, National Geodetic Vertical Datum of 1929.

Prior to May 4, 1934, nonrecording gage at same site and datum. Prior to Nov. 9, 1982, gage 200 ft upstream at 10.00 ft higher datum.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--52 years, 11.4 ft<sup>3</sup>/s, 4.99 in/yr, 8,259 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 25,000 ft<sup>3</sup>/s, Oct. 2, 1959, gage height, 18.9 ft, from floodmarks, from rating curve extended above 2,500 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 13.4 ft and 17.5 ft; no flow at times in each year except 1975.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 27, 1912, reached a stage of 16.6 ft at gage, based on floodmarks set by local resident at site 900 ft downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft<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. 14	0600	1,380	13.43	Apr. 3	1945	1,290	13.14
Nov. 15	0400	3,360	18.63	Sept. 29	2000	*7,070	*23.64

No flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.48	.57	4.9	2.6	2.9	4.2	2.6	2.4	1.7	1.8	.00	.00
2	.28	.57	4.0	2.6	2.8	3.5	25	2.2	1.5	1.1	.00	.00
3	.23	.61	2.9	2.6	2.8	3.3	298	2.1	1.5	.49	.00	.00
4	.21	.66	2.9	2.4	2.9	3.3	176	2.2	1.5	.34	.00	.00
5	.25	.77	3.3	2.4	3.0	3.5	19	2.2	5.8	.28	.00	.00
6	.33	.78	3.6	2.4	2.9	4.0	10	2.1	3.4	.23	.00	.00
7	.39	1.0	3.6	2.4	2.8	4.2	7.6	1.9	26	.20	.00	.00
8	.37	1.5	3.6	2.2	2.8	4.3	5.7	1.9	2.9	.20	15	.00
9	.40	1.6	3.3	2.1	2.8	4.1	4.5	2.6	3.0	.20	1.0	.00
10	.58	1.6	2.9	2.2	2.8	3.9	4.2	2.9	1.8	.18	14	.00
11	.76	1.6	2.8	2.4	2.6	58	4.2	3.4	1.1	.16	.54	.00
12	1.5	145	2.8	2.6	2.6	86	3.9	2.2	1.0	.15	.24	.00
13	1.1	135	2.8	2.6	2.6	11	3.9	1.8	.88	.16	.16	.00
14	479	325	2.6	2.6	2.6	5.4	4.4	3.6	27	.19	.12	.00
15	16	969	2.7	2.6	3.0	4.0	3.6	13	20	.20	.11	.00
16	1.9	42	2.9	2.6	3.4	3.4	3.1	3.1	1.7	.16	.14	.00
17	1.0	18	3.2	2.6	3.7	3.5	7.1	55	1.0	.13	.16	.00
18	339	67	3.3	2.6	3.9	29	7.5	7.8	.76	.11	.13	.00
19	16	30	3.1	2.6	3.4	5.8	4.1	3.0	.59	.08	.10	.00
20	1.6	10	2.7	2.7	3.2	2.9	4.0	2.0	.56	.06	.09	.00
21	.48	6.6	2.6	2.8	2.9	2.4	3.9	1.9	.43	.04	.06	.00
22	.26	6.0	2.7	2.8	2.8	2.5	3.2	1.7	.37	.01	.04	.00
23	.20	5.5	2.9	2.5	2.9	2.4	3.5	1.6	.75	.03	.01	.00
24	.18	4.7	3.0	2.6	3.2	2.4	3.3	1.5	.49	.12	.00	.00
25	.18	4.3	2.8	2.6	3.4	2.6	3.1	1.5	19	.13	.00	.00
26	.18	4.2	2.4	2.5	3.6	2.2	3.0	1.5	41	.11	.00	.00
27	.18	4.1	2.4	2.4	3.6	2.1	3.7	1.6	1.5	.08	.00	.00
28	.22	3.7	2.4	2.5	4.7	2.2	4.1	1.7	.71	.06	.00	.00
29	.60	3.4	2.6	2.6	---	2.3	3.0	1.5	.42	.03	.00	1800
30	.76	3.4	2.6	2.7	---	2.3	2.6	1.6	.34	.0	.00	311
31	.60	---	2.6	2.9	---	2.4	---	1.7	---	.00	.00	---
TOTAL	865.22	1798.16	92.9	78.7	86.6	273.1	631.8	135.2	168.70	7.03	31.90	2111.00
MEAN	27.9	59.9	3.00	2.54	3.09	8.81	21.1	4.36	5.62	.23	1.03	70.4
MAX	479	969	4.9	2.9	4.7	86	298	55	41	1.8	15	1800
MIN	.18	.57	2.4	2.1	2.6	2.1	2.6	1.5	.34	.00	.00	.00
AC-FT	1720	3570	184	156	172	542	1250	268	335	14	63	4190

CAL YR 1985 TOTAL 12817.82 MEAN 35.1 MAX 1340 MIN .00 AC-FT 25420  
WTR YR 1986 TOTAL 6280.24 MEAN 17.2 MAX 1800 MIN .00 AC-FT 12460

ARKANSAS RIVER BASIN

61

07164200 KEYSTONE LAKE NEAR SAND SPRINGS, OK

LOCATION.--Lat 36°09'05", long 96°15'05", in SW 1/4 SE 1/4 sec.4, T.19 N., R.10 E., Tulsa County, Hydrologic Unit 11110101, in stair tower of intake structure near left end of Keystone Dam on Arkansas River, 8.5 mi west of Sand Springs, and at mile 538.6.

DRAINAGE AREA.--74,506 mi<sup>2</sup>, of which 12,541 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--September 1964 to current year. Prior to October 1970, published as Keystone Reservoir near Sand Springs.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929. Prior to Nov. 1, 1964, nonrecording gage nearby at same datum.

REMARKS.--Reservoir is formed by rolled-fill earth dam. Spillway is concrete ogee-type weir controlled by 18 40-foot taintor gates. Outlet works consist of nine sluices. Regulated storage began Sept. 11, 1964; power pool was first filled Nov. 20, 1964. Capacity, 1,738,000 acre-ft, at elevation 754.0 ft, top of flood control pool, 557,600 acre-ft, at elevation 723.0 ft, top of power pool, 260,900 acre-ft, at elevation 706.0 ft, minimum power pool. Figures given herein represent total contents. Reservoir is designed for flood control, power development, and conservation. Revised capacity table, based on survey in 1977, used since Oct. 1, 1983.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,886,000 acre-ft, Nov. 6, 1974, elevation, 754.86 ft; minimum since power pool was first filled, 297,800 acre-ft, Jan. 19, 1965, elevation, 705.07 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 925,400 acre-ft, Nov. 20, elevation 735.53 ft; minimum, 507,200 acre-ft, Oct. 12, elevation, 720.78 ft.

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

715	395,300	725	606,700
718	450,200	733	840,100
721	512,000	740	1,088,000

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	613800	646800	839400	613100	536900	556700	559300	546100	627600	639800	582200	579700
2	610500	636400	825400	606400	543600	562300	556700	537600	624200	635800	578500	584600
3	608500	622400	813900	598800	547300	559700	568600	542000	622400	630500	580200	583900
4	606400	621100	803300	598600	547100	555700	597100	546800	627100	629000	576100	581700
5	598600	625000	790100	593300	545700	552900	604600	538300	635800	627400	582200	581200
6	586600	641200	779500	586100	547100	550600	599300	528300	657700	624500	578000	580900
7	571500	645500	775500	579500	546400	547800	592100	518500	674700	615100	580500	578700
8	565400	651100	770800	574400	553600	552400	591600	513600	689100	605900	584400	572400
9	556900	642500	763500	571500	563100	558800	589600	516200	701400	597600	597300	565400
10	538300	636900	748000	568300	560700	563100	585600	535300	711800	599800	606200	558100
11	517100	624200	731200	565200	557600	570000	579700	560900	705700	605200	606400	559300
12	509200	628700	719700	567100	556700	574600	580000	577500	688200	609000	603100	560000
13	553800	641200	713800	563500	551500	564700	583400	593100	688500	616400	599100	562800
14	658700	674700	707400	559700	547500	551700	571700	611300	697400	619500	595300	565700
15	717400	712700	700800	554800	553600	550600	561900	632700	700500	616700	592600	565400
16	746500	758300	694800	552400	561200	549600	560900	646300	705100	613600	601400	565900
17	764100	840400	688200	549600	557600	545900	563500	697900	696800	624000	610300	562300
18	794200	897600	679800	551000	552700	546800	560200	736000	694200	638500	611800	556200
19	828700	921300	671100	551000	553800	540400	564000	746800	698800	649800	613800	549600
20	852600	925100	666700	541300	553400	537200	565400	743700	694500	646000	614400	551300
21	848000	923700	669200	534700	549700	534700	563500	729400	684000	640600	615900	552900
22	826700	916100	672000	523600	554300	539900	560400	716200	672000	642000	617500	551700
23	802400	902000	668400	522700	553100	545700	559500	701400	661200	642500	621400	550800
24	775200	891800	661500	522900	555200	545900	557400	683700	654400	639300	619500	547100
25	748300	883700	654900	529100	554300	546600	555500	668100	650300	640600	609500	545700
26	721500	882700	651900	534900	555700	546600	559700	649200	645700	642300	599300	548500
27	696800	875300	647400	533100	553100	548200	565400	639600	642000	635300	594300	552000
28	676400	864900	641200	531900	551300	552700	562600	638800	641200	624000	589600	564000
29	663100	854900	635000	529100	---	556900	560000	636100	642000	611000	584100	610500
30	651100	851000	627600	527200	---	558300	554500	631900	642000	597100	589600	830900
31	647900	---	620600	530400	---	558500	---	629500	---	581400	592300	---
MAX	852600	925100	839400	613100	563100	574600	604600	746800	711800	649800	621400	830900
MIN	509200	621100	620600	522700	536900	534700	554500	513600	622400	581400	576100	545700
(+)	726.57	733.33	725.54	721.82	722.73	723.04	722.87	725.88	726.35	723.99	724.43	732.72
(++)	+22,500	+203,100	-230,400	-90,200	+20,900	+7,200	-4,000	+75,000	+12,500	-60,600	+10,900	+238,600
CAL YR 1985	MAX 1070000	MIN 509200	++	-68,800								
WTR YR 1986	MAX 925100	MIN 509200	++	+205,500								

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

LOCATION.--Lat 36°08'37", long 96°00'13", in NW 1/4 sec.11, T.19 N., R.12 E., Tulsa County, Hydrologic Unit 11110101, near left bank on downstream side of pier of 11th Street bridge on U.S. Highway 66 in Tulsa, 10.1 mi upstream from Polecat Creek. 15.1 mi downstream from Keystone Dam. and at mile 523.7.

WATER-DISCHARGE RECORDS

REVISED RECORDS.--WSP 1341: Drainage area.

REMARKS.--Estimated daily discharges: Apr. 23. Records good. Except for 109 m<sup>2</sup> intervening area, flow completely regulated by Keystone Lake (station 07164200) since September 1964. Prior to September 1964, minor regulation by John Martin Lake in Colorado and by Great Salt Plains Lake (station 07150000).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 246,000 ft<sup>3</sup>/s, Oct. 5, 1959, gage height, 22.00 ft; minimum, 27 ft<sup>3</sup>/s, Oct. 12, 13, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 48,200 ft<sup>3</sup>/s, Oct. 21, gage height, 9.67 ft; minimum daily discharge 266 ft<sup>3</sup>/s, Mar. 24.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16400	14700	11700	10200	547	3340	3520	5840	5370	7850	5540	8890
2	16100	13100	11700	9950	301	318	4940	6020	5910	7690	2670	1720
3	15900	13100	11800	9850	309	1910	5650	2510	6600	7750	517	2370
4	13700	10500	11900	7900	3980	4320	7990	387	4890	6590	1320	5200
5	11500	1980	11900	6780	4400	5240	13600	3650	4430	5760	2140	4960
6	13100	4680	11900	10000	4320	5060	13700	6730	4350	5710	2020	3830
7	13300	7740	11900	8760	3980	5250	13500	7640	7290	6640	2030	4060
8	11300	7360	11800	9580	2420	4030	6860	6380	11600	8270	1140	4780
9	8450	3480	12600	9650	348	2430	5660	5160	11700	8180	1720	5610
10	13700	2110	18600	9630	3450	1020	5180	3900	11700	8910	373	6330
11	13500	6080	18800	9550	7870	4780	6350	2610	12600	7570	1860	3980
12	13700	7130	17600	7420	6660	6120	2970	7340	22200	9140	3350	2710
13	13700	7340	12600	8960	6300	8740	2450	8570	20900	8410	4620	2180
14	15700	7730	12400	9530	5380	10000	6360	8630	11600	7690	5170	1150
15	17600	12200	12500	9890	1870	6580	5710	7790	11600	8030	5290	1180
16	28300	12000	12400	9060	354	3840	5920	12900	13000	11100	3020	2730
17	41700	12000	12400	8300	3450	5600	3220	15600	23200	11000	342	4260
18	43500	12200	12300	5360	6600	4220	3660	12500	20700	7910	2110	3910
19	46000	13000	12400	3750	4710	4040	5980	15900	11200	8860	5230	5270
20	47500	11800	12200	7120	4630	5620	4010	23500	11000	11400	5450	3170
21	48000	11700	5650	8200	5490	4500	2640	23300	10800	11200	7040	1190
22	46300	13000	6660	8580	2230	2000	3630	23000	11000	7420	7320	1140
23	44800	17000	8100	5110	3100	316	3170	22600	11000	8160	5040	2030
24	43000	17100	11000	3710	2970	266	3150	22500	9320	8200	3790	2720
25	41400	16300	10300	1780	4930	4370	2770	23500	6600	7160	5900	2210
26	39600	11900	10200	384	5150	3160	1740	22100	8780	1550	7430	2460
27	37800	11600	9720	1340	4810	4390	391	18600	8940	4970	5740	1980
28	34800	11500	9850	3200	5080	2460	1230	11600	7440	7680	4940	1080
29	29000	11700	9790	4950	---	2040	2710	11500	6560	8010	4840	2230
30	25400	11700	9970	5330	---	1900	4800	8080	4420	8260	3050	8600
31	19800	---	9780	4090	---	4490	---	6650	---	8190	966	---
TOTAL	824550	313730	362420	217914	105639	122350	153461	356987	316700	245260	111968	103930
MEAN	26600	10460	11690	7029	3773	3947	5115	11520	10560	7912	3612	346



## ARKANSAS RIVER BASIN

63

07164500 ARKANSAS RIVER AT TULSA, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-61, 1977 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: March 1977 to July 1985.

WATER TEMPERATURE: March 1977 to July 1985.

INSTRUMENTATION.--Water-quality monitor since March 1977.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 7,820 microsiemens, Feb. 16, 1978; minimum daily, 518 microsiemens, July 27, 1977.

WATER TEMPERATURE: Maximum daily, 32.0 °C, July 3-6, 14, 1978; minimum daily, 0.0 °C on many days during winter periods.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)
DEC 30...	1500	1028	80020	4.57	11500	2270	7.80	--	5.0	10	739
JAN 28...	1515	1028	80020	2.05	706	2860	8.20	--	6.0	4.0	738
APR 24...	1640	1028	80020	2.05	574	*2100	8.50	28.0	23.0	6.2	740
JUN 25...	1600	1028	80020	4.72	10900	1700	7.90	31.0	29.5	18	745
JUL 09...	1130	1028	80020	2.41	2170	1380	8.40	35.0	31.0	3.5	744
SEP 24...	1500	1028	80020	2.29	1870	2310	8.50	28.5	28.0	3.1	736
DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS./ 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
DEC 30...	11.7	95	46	55	260	110	71	20	320	72	9
JAN 28...	11.8	99	--	--	340	160	92	27	370	70	9
APR 24...	8.2	99	K6	K18	300	130	77	25	300	68	8
JUN 25...	6.9	93	80	140	230	100	62	18	270	71	8
JUL 09...	8.2	114	59	60	210	84	57	16	200	--	6
SEP 24...	7.0	93	--	--	230	91	61	18	380	78	11
DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HC03)	CAR- BONATE IT-FLD (MG/L AS C03)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITU- ENTS, DIS- SOLVED (MG/L)
DEC 30...	4.9	181	0	148	4.6	130	500	0.30	8.9	1150	1200
JAN 28...	6.7	217	0	178	2.2	170	550	0.90	7.8	1320	1300
APR 24...	5.3	189	6.0	166	0.9	150	480	0.70	3.4	1170	1100
JUN 25...	5.4	156	0	128	3.1	110	430	0.30	6.7	989	980
JUL 09...	--	287	4.0	124	1.8	100	310	0.40	6.4	787	--
SEP 24...	5.7	152	7.0	136	0.8	120	580	0.40	2.9	1400	1300

\* SPECIFIC CONDUCTANCE, LAB (US/CM)

## ARKANSAS RIVER BASIN

07164500 ARKANSAS RIVER AT TULSA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)
DEC 30...	1.6	35700	1.09	4.9	0.010	0.03	1.10	0.090	0.080	0.10
JAN 28...	1.8	2520	0.990	4.4	0.010	0.03	1.00	0.140	0.140	0.18
APR 24...	1.6	1810	0.300	--	0.060	0.20	0.360	0.130	0.120	0.15
JUN 25...	1.3	29100	--	--	<0.010	--	0.560	0.080	0.050	0.06
JUL 09...	--	--	--	--	<0.010	--	0.420	0.090	0.080	0.10
SEP 24...	1.9	7070	0.380	--	0.010	0.03	0.390	<0.010	<0.010	--

DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
DEC 30...	0.51	0.60	0.160	0.49	0.150	0.120	0.37	20	2	100
JAN 28...	0.76	0.90	0.160	--	0.120	0.110	0.34	--	--	--
APR 24...	0.67	0.80	0.120	--	0.080	0.080	0.25	--	--	--
JUN 25...	0.52	0.60	0.140	--	0.110	0.100	0.31	30	3	150
JUL 09...	0.61	0.70	0.130	--	0.100	0.090	0.28	--	--	--
SEP 24...	--	0.90	0.110	--	0.090	0.080	0.25	20	4	100

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
DEC 30...	<10	<1	<1	<1	3	20	1	10	10	0.2
JAN 28...	--	--	--	--	--	--	--	--	--	--
APR 24...	--	--	--	--	--	--	--	--	--	--
JUN 25...	<0.5	5	<1	<3	12	9	<5	13	15	<0.1
JUL 09...	--	--	--	--	--	--	--	--	--	--
SEP 24...	<10	<1	<1	<1	1	<10	<5	10	10	<0.1

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
DEC 30...	3	<1	1	<1	800	10	20	23	714	63
JAN 28...	--	--	--	--	--	--	--	6	11	96
APR 24...	--	--	--	--	--	--	--	10	15	95
JUN 25...	<10	2	<1	<1	720	7	22	24	706	63
JUL 09...	--	--	--	--	--	--	--	12	70	63
SEP 24...	4	1	<1	<1	760	<6	<10	7	35	47

07165000 HEYBURN LAKE NEAR HEYBURN, OK

LOCATION.--Lat 35°56'52", long 96°17'55", in SE 1/4 sec.13, T.17 N., R.9 E., Creek County, Hydrologic Unit 11110101, at intake structure at right abutment of Heyburn Dam on Polecat Creek, 2.5 mi northwest of Heyburn, 3.5 mi upstream from bridge on U.S. Highway 66, 11.0 mi southwest of Sapulpa, and at mile 48.6.

DRAINAGE AREA.--123 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1950 to current year. Prior to October 1970, published as Heyburn Reservoir near Heyburn.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earth dam. Outlet works consist of an 8-foot, 3-inch diameter concrete conduit extending from an uncontrolled concrete drop inlet at the upstream side of dam at a concrete stilling basin near downstream toe of dam and three, 36-inch gated lowflow pipes which drain into the conduit below the drop inlet. Spillway is 200-foot channel in a natural saddle about 1,000 ft west of right abutment. Storage began Sept. 29, 1950; conservation pool was first filled Mar. 10, 1951. Capacity, 147,600 acre-ft, at elevation 802.0 ft maximum pool, 55,400 acre-ft, at elevation 784.0 ft, spillway crest and top of flood control pool, and 7,105 acre-ft, at elevation 761.5, conservation pool. Dead storage, 293 acre-ft, below elevation 740.0 ft, invert of lowflow sluices. Reservoir was designed for flood control and conservation. Figures given herein represent total contents. Revised capacity table, based on survey in 1978, used since Oct. 1, 1984.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 32,210 acre-ft, Nov. 4, 1974, elevation, 776.85 ft; minimum since conservation pool was first filled, 4,070 acre-ft, May 8, 9, 1981, elevation 757.95 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 13,130 acre-ft, May 17, elevation, 766.84 ft; minimum, 6,050 acre-ft, Sept. 25, elevation 760.22 ft.

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

760	5,880	764	9,591
761	6,675	765	10,770
762	7,552	766	12,020
763	8,515	767	13,350

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6750	7360	7650	7320	7250	7250	7450	7470	7400	7300	6550	6190
2	6740	7340	7610	7320	7270	7250	7520	7440	7370	7280	6520	6200
3	6720	7300	7570	7300	7280	7250	9540	7420	7370	7220	6490	6190
4	6710	7300	7520	7300	7300	7250	9670	7330	7410	7210	6460	6200
5	6700	7270	7510	7290	7300	7240	8910	7370	7600	7180	6550	6200
6	6670	7260	7490	7300	7350	7240	8530	7350	7640	7170	6540	6190
7	6640	7240	7480	7280	7360	7230	8210	7340	7670	7150	6520	6170
8	6650	7230	7470	7270	7390	7220	7970	7330	7640	7120	6530	6170
9	6650	7240	7450	7250	7390	7250	7820	7330	7600	7100	6550	6150
10	6720	7250	7490	7240	7380	7240	7710	7620	7580	7070	6530	6140
11	6720	7240	7670	7240	7360	11450	7640	7640	7520	7050	6520	6130
12	6730	7260	7650	7240	7350	11660	7580	7570	7480	7020	6490	6120
13	6860	9770	7620	7240	7340	9930	7580	7510	7440	7000	6470	6090
14	9910	10350	7550	7240	7340	8930	7640	7520	7400	6990	6450	6090
15	8960	9530	7530	7240	7330	8480	6720	7640	7360	6960	6490	6090
16	8330	8800	7520	7240	7410	8210	7540	7600	7340	6930	6470	6120
17	8000	8350	7510	7240	7410	7970	8360	12380	7320	6900	6470	6160
18	12310	9990	7500	7250	7400	7870	8260	10590	7300	6860	6450	6160
19	10250	11960	7470	7250	7890	7730	8210	9340	7270	6840	6430	6150
20	9670	10090	7450	7240	7370	7640	8200	8630	7260	6810	6410	6130
21	8430	9090	7430	7250	7340	7570	8020	8190	7240	6780	6390	6120
22	8090	8490	7420	7240	7330	7510	7830	7950	7220	6770	6370	6100
23	7970	8180	7410	7240	7330	7490	7690	7800	7800	6740	6350	6090
24	7690	7980	7400	7240	7300	7450	7600	7670	7670	6720	6330	6070
25	7600	7820	7370	7240	7330	7420	7540	7580	7570	6700	6300	6050
26	7530	7750	7350	7220	7330	7420	7490	7510	7490	6670	6300	6270
27	7470	7670	7330	7220	7290	7400	7510	7490	7420	6630	6290	6230
28	7420	7610	7330	7230	7270	7390	7460	7450	7370	6610	6270	6230
29	7440	7570	7330	7230	---	7370	7430	7440	7330	6570	6230	6430
30	7410	7580	7330	7230	---	7360	7430	7420	7280	6550	6210	6190
31	7330	---	7330	7230	---	7350	---	7400	---	6540	6200	---
MAX	12310	11960	7670	7320	7890	11660	9670	12380	7800	7300	6550	6430
MIN	6640	7230	7330	7220	7250	7220	6720	7330	7220	6540	6200	6050
(+)	761.81	762.04	761.75	761.64	769.69	761.78	761.87	761.83	761.70	760.84	760.42	760.40
(++)	+580	+250	-250	-100	+40	+80	+80	-30	-120	-740	-340	-10

CAL YR 1985 MAX 30790 MIN 6460 ++ -10,780  
WTR YR 1986 MAX 12380 MIN 6050 ++ -560

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

## ARKANSAS RIVER BASIN

07165570 ARKANSAS RIVER NEAR HASKELL, OK

LOCATION.--Lat 35°49'23", long 95°38'39", in NE 1/4 sec.31, T.16 N., R.16 E., Muskogee County, Hydrologic Unit 11110101, near right bank on downstream side of bridge on State Highway 104, 2 mi east of Haskell, 23.5 mi upstream from Verdigris River, and at mile 483.7.

DRAINAGE AREA.--75,473 mi<sup>2</sup>, of which 12,541 mi<sup>2</sup> probably is noncontributing.

PERIOD OF RECORD.--June 1972 to current year.

GAGE.--Water-stage recorder. Datum of gage is 530.00 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 29 to Jan. 2, Apr. 12-15. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by Keystone Lake (station 07164200) 55.1 mi upstream.

AVERAGE DISCHARGE.--14 years, 8,894 ft<sup>3</sup>/s, 6,444,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 108,000 ft<sup>3</sup>/s Nov. 6, 1974, gage height, 17.30 ft; minimum daily, 193 ft<sup>3</sup>/s Feb. 26, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 56,900 ft<sup>3</sup>/s Oct. 18, gage height, 14.01 ft; minimum daily discharge, 326 ft<sup>3</sup>/s Sept. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17700	20000	14600	9010	2860	3540	2080	5630	8960	6520	9520	811
2	17100	16200	13500	10000	1280	2280	2030	7250	7920	8990	6130	9070
3	17300	15100	12400	9450	738	976	3560	6700	7940	8550	3100	1490
4	17300	14400	12400	9510	620	1340	10500	3860	8760	8570	1160	2590
5	14800	9690	12500	7270	2410	3570	13600	1380	7560	6820	1570	5110
6	14300	4570	12400	6930	4300	3590	15100	3370	11100	6240	2390	4470
7	14700	7010	12400	9460	4020	3390	14400	6920	6880	6180	1970	3220
8	14900	8480	12500	8600	3830	3710	13000	7520	9840	7770	2510	4000
9	12400	8350	12400	9280	2580	2580	8370	6570	15500	9070	1250	4660
10	10800	4190	15000	9270	1170	857	7520	6500	15800	9170	1630	5110
11	15400	3300	23900	9270	2730	812	7000	5350	14600	9650	949	5670
12	15800	7100	22300	9090	6520	8540	7800	4240	17400	8850	1790	2520
13	18700	7960	17300	6810	5560	11200	6600	7690	23100	9960	4320	1570
14	30900	10700	13500	9030	6430	12100	6400	9450	19600	10200	5170	983
15	32900	15900	13200	9250	5750	10800	8400	21500	13700	8900	5930	402
16	24200	17600	13200	9530	2740	6150	7100	15600	13800	9680	6070	462
17	36900	14000	13100	8420	1100	4290	5360	23400	17200	13200	2980	1700
18	47600	15100	12800	7530	2630	5190	4830	25800	23900	12800	815	3660
19	52300	25800	12700	4480	5800	4220	6050	19800	18800	9930	1560	3430
20	47900	23400	12500	3440	3150	4290	4770	21500	13600	10800	5170	4170
21	46700	17100	10900	7320	3210	4940	3900	24500	13400	13100	5390	1780
22	46300	13800	6320	7820	4750	4100	3730	23800	13400	13000	7440	433
23	45700	15800	6000	8400	2930	2730	4140	23200	13400	9900	7820	326
24	44700	17700	8140	4650	2760	1260	3760	23700	13100	10300	4150	739
25	43400	17400	10000	3700	2540	1000	3360	25200	10900	10200	3490	1390
26	42200	15500	9490	2130	3190	2770	3420	24600	9240	7640	6780	1170
27	40700	12800	10200	933	3640	2650	2760	22900	10000	3100	8060	2610
28	39200	12500	9020	1210	3350	2590	1440	18200	10300	6480	5690	1420
29	37700	12000	9030	2730	---	1390	1570	15300	8890	9170	4770	1540
30	34000	12000	9020	3770	---	883	3120	14100	7550	9550	4660	23700
31	26600	---	9040	3600	---	735	---	11400	---	10000	2200	---
TOTAL	921100	395450	381760	211893	92588	118473	185670	436930	386140	284290	126434	100206
MEAN	29710	13180	12310	6835	3307	3822	6189	14090	12870	9171	4079	3340
MAX	52300	25800	23900	10000	6520	12100	15100	25800	23900	13200	9520	23700
MIN	10800	3300	6000	933	620	735	1440	1380	6880	3100	815	326
AC-FT	1827000	784400	757200	420300	183600	235000	368300	866700	765900	563900	250800	198800
CAL YR 1985 TOTAL	4851370			MEAN	13290	MAX	52300	MIN	980	AC-FT	9623000	
WTR YR 1986 TOTAL	3640934			MEAN	9975	MAX	52300	MIN	326	AC-FT	7222000	

## ARKANSAS RIVER BASIN

67

## 07171000 VERDIGRIS RIVER NEAR LENAPAH, OK

LOCATION.--Lat 36°51'05", long 95°35'06", at center of sec.3, T.27 N., R.16 E., Nowata County, Hydrologic Unit 11070103, on right bank on downstream side of county road bridge, 2.8 mi east of Lenapah, 4.5 mi upstream from Cedar Creek, and at mile 144.6.

DRAINAGE AREA.--3,639 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 977: 1942 (M). WSP 1117: drainage area.

GAGE.--Water-stage recorder. Datum of gage is 644.89 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 10-14, Dec. 24 to Jan. 6, and Sept. 5-29. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by dams in Kansas since April 1949.

AVERAGE DISCHARGE.--(Prior to regulation) 11 years (water years 1939-49), 2,599 ft<sup>3</sup>/s, 1,833,000 acre-ft/yr; (since regulation) 20 years (water years 1967-86), 2,613 ft<sup>3</sup>/s, 1,893,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 137,000 ft<sup>3</sup>/s, May 20, 1943, gage height, 40.44 ft, from floodmarks; no flow at times in 1939-40, and 1956.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 39,900 ft<sup>3</sup>/s, Sept. 30, stage rising, peak occurred on Oct. 5, 1986; maximum peak discharge, 30,500 ft<sup>3</sup>/s, Nov. 16, gage height, 28.56 ft; minimum daily discharge, 40 ft<sup>3</sup>/s, Aug. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8690	7530	9190	1520	406	814	446	1540	1360	656	76	57
2	5530	4160	7670	1310	412	705	662	2680	1170	818	74	51
3	6810	1880	5920	1230	489	651	3990	2200	1340	903	67	50
4	7030	1110	3710	1220	4040	644	12200	1870	1330	927	47	50
5	3450	1010	2830	1170	3950	622	10500	1770	1620	893	40	48
6	1750	995	2220	1080	2910	606	6270	1310	6180	875	140	49
7	1070	944	1930	1620	2990	595	4750	1360	3880	1130	187	56
8	965	813	1850	1730	2890	528	4940	2150	2230	759	99	64
9	896	752	1980	1690	2630	489	7070	2270	1870	465	105	84
10	925	740	3310	1710	2360	663	7040	5300	1850	422	108	112
11	1610	730	10500	1410	2160	750	6360	6800	8230	287	310	122
12	5110	780	7670	1410	1980	6180	5940	7710	2620	306	565	165
13	10400	820	6100	1980	1790	3110	5160	6530	1880	19800	268	283
14	14200	4400	3780	2000	1430	1870	5530	7810	1730	12800	184	195
15	9220	29500	2600	2010	1240	1470	5860	16400	1610	2650	150	220
16	7460	29700	2490	2000	1040	1150	4500	7490	1470	2940	134	635
17	7920	26200	2350	1650	1150	1070	3450	16700	1010	2980	516	2410
18	10200	23100	2050	1050	1510	1040	2690	26100	721	2910	547	990
19	15900	18300	1840	725	1640	907	2120	12000	590	2830	292	1150
20	16500	16400	1620	637	1710	863	1570	4590	472	2720	207	910
21	9290	13800	1550	621	1860	842	1330	7370	375	2450	164	695
22	9800	16200	1450	595	1570	1020	1160	8430	220	2330	159	660
23	11300	17500	1900	597	1430	1040	1030	8260	362	1530	168	654
24	11700	17800	2200	974	1290	880	1010	7610	276	983	173	615
25	11600	17500	2100	959	1280	803	948	6930	159	502	214	520
26	11300	17200	2400	792	1240	792	840	6690	158	184	202	460
27	11100	16800	2600	540	1050	687	651	6530	157	131	187	395
28	10800	16000	2700	411	878	487	482	5440	1430	113	134	340
29	11400	13200	2500	397	---	411	452	3860	661	100	96	250
30	11200	9650	2200	389	---	419	406	2920	808	92	80	26900
31	9080	---	1980	399	---	407	---	1910	---	79	63	---
TOTAL	254206	325514	105190	35826	49325	32515	109357	200530	47769	66565	5756	39190
MEAN	8200	10850	3393	1156	1762	1049	3645	6469	1592	2147	186	1306
MAX	16500	29700	10500	2010	4040	6180	12200	26100	8230	19800	565	26900
MIN	896	730	1450	389	406	407	406	1310	157	79	40	48
AC-FT	504200	645700	208600	71060	97840	64490	216900	397800	94750	132000	11420	77730

CAL YR 1985 TOTAL 2222740 MEAN 6090 MAX 48400 MIN 59 AC-FT 4409000  
WTR YR 1986 TOTAL 1271740 MEAN 3484 MAX 29700 MIN 40 AC-FT 2523000



## ARKANSAS RIVER BASIN

07171300 OOLOGAH LAKE NEAR OOLOGAH, OK

LOCATION.--Lat 36°25'19", long 95°40'43", in NE 1/4 NW 1/4 sec.2, T.22 N., R.15 E., Rogers County, Hydrologic Unit 11070103, in gage tower 1,000 ft from left end of dam on Verdigris River, 2.0 mi southeast of Oologah, and at mile 90.3.

DRAINAGE AREA.--4,339 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1963 to current year. Prior to October 1970, published as Oologah Reservoir near Oologah.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth dam. Spillway is concrete ogee-type weir controlled by 7 taintor gates. Storage began May 15, 1963, conservation pool was first filled Apr. 4, 1964. Capacity 1,519,000 acre-ft at elevation 661.0 ft, top of flood control pool, 553,400 acre-ft at elevation 638.0 ft, conservation pool. Dead storage 9,260 acre-ft below elevation 592.0 ft. Figures given herein represent total contents. Reservoir is used for flood control and conservation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,426,000 acre-ft, Apr. 26, 1973, elevation, 659.33 ft; minimum since conservation pool first filled 33,750 acre-ft, Aug. 28, and Oct. 27, 1969, elevation, 602.87 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,086,000 acre-ft, Nov. 21, elevation, 652.47 ft; minimum, 529,600 acre-ft, May 8, elevation, 637.17 ft.

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

636	496,290	644	750,470
638	553,420	648	896,300
641	645,970	652	1,109,000

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	576500	659000	922800	604600	552300	553100	552600	557200	604000	582000	550800	553100
2	566300	659000	890300	602200	552800	554900	554600	556600	605900	575800	550800	553100
3	561200	655400	854300	596400	555400	555100	564500	553100	605600	570600	550000	552600
4	564200	650200	818300	592400	559500	554600	591500	548500	606500	564500	548200	552800
5	566300	641100	780200	584700	563900	555400	608600	542800	610800	563000	550000	552600
6	563300	640100	756400	582300	562000	554300	610800	536200	619400	560600	549400	556300
7	556300	632600	743200	572200	565700	556600	608300	533000	624000	557700	549100	552600
8	560000	623300	732700	561800	563600	555100	607400	533900	622400	555400	558900	550500
9	558900	622400	721600	554300	565400	553100	610200	533300	623700	554900	562000	548500
10	556300	616000	719900	550500	561200	558900	610800	538800	624600	553400	563900	548000
11	552600	609200	730700	552600	560000	567600	615700	549700	636200	553700	563000	550800
12	554600	627400	731700	554300	563000	578900	616900	558000	638800	551100	562700	550800
13	566300	661600	721600	556000	565400	580100	629000	559700	634900	605000	562700	550800
14	600700	729600	720600	561800	568800	572500	603700	560600	631000	635600	562400	550500
15	608600	799400	712900	558600	564200	566000	606200	578300	625500	625800	563000	554600
16	604300	862600	705300	556900	566300	558000	607400	586000	623300	615700	564200	580100
17	600700	916100	703200	555700	564800	553400	607700	605900	621200	605600	564800	594800
18	615400	972300	694900	558300	563600	554600	611100	642700	620300	596700	565400	591500
19	632000	1038000	691300	556300	558900	553400	610200	663900	619100	590500	565400	588100
20	643700	1078000	687700	552800	559500	553100	608600	655100	616600	584400	564500	582300
21	643400	1081000	685700	556600	556000	551400	604600	646900	614800	577100	563300	575800
22	636200	1074000	684400	554300	556000	549700	599400	642100	611100	572800	562400	570900
23	638100	1072000	685100	551400	556300	551100	591800	638100	615700	568200	564500	564500
24	638500	1066000	685700	554000	556300	549700	588700	631600	617200	563000	560000	557700
25	636800	1051000	681800	555100	555100	551100	584700	624300	619700	560600	559500	555700
26	635900	1039000	675600	560000	556600	549700	578000	616300	622100	558300	564200	570600
27	635200	1022000	665200	554600	557200	549700	575200	610500	601300	554600	560900	590500
28	633900	997700	649900	554900	553700	548800	570300	609600	598200	553700	558000	589000
29	646300	974400	630000	553400	---	548800	563600	607400	592100	553400	555700	651200
30	647300	949100	617800	552600	---	550000	562400	607700	586600	551700	555100	793900
31	650500	---	611100	551100	---	548500	---	605000	---	552800	554600	---
MAX	650500	1081000	922800	604600	568800	580100	629000	663900	638800	635600	565400	793900
MIN	552600	609200	611100	550500	552300	548500	552600	533000	586600	551100	548200	548000
(+)	641.14	649.32	639.90	637.92	638.01	637.83	638.31	639.70	639.10	637.98	638.04	645.31
(++)	+77,800	+298,600	-338,000	-60,000	+2,600	-5,200	+13,900	+42,600	-18,400	-33,800	+1,800	+239,300
CAL YR 1985	MAX	1126000	MIN	532100	(++)	-160,700						
WTR YR 1986	MAX	1081000	MIN	533000	(++)	+221,200						

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET

ARKANSAS RIVER BASIN

69

07171400 VERDIGRIS RIVER NEAR OOLOGAH, OK

LOCATION.--Lat 36°25'17", long 95°41'01", in NW 1/4 sec.2, T.22 N., R.15 E., Rogers County, Hydrologic Unit 11070105, on right bank 0.2 mi downstream from Oologah Dam, 1.2 mi upstream from Fourmile Creek, 2 mi southeast of Oologah, and at mile 90.0.

DRAINAGE AREA.--4,339 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 552.00 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 12, 18-20, Mar. 29 to Apr. 15, May 17, July 13, Aug. 9, and Sept. 27, 29-30. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by several dams in Kansas prior to May 1963, and completely regulated thereafter by Oologah Lake (station 07171300).

AVERAGE DISCHARGE.--(Since regulation by Oologah Lake) 22 years (water years 1965-86), 2,880 ft<sup>3</sup>/s, 2,087,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,000 ft<sup>3</sup>/s, May 16, 1973, gage height, 38.05 ft; no flow at times in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1943 reached a stage of 65.2 ft, from floodmarks. Flood of May 9, 1961, reached a stage of 52.8 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 25,700 ft<sup>3</sup>/s, Nov. 26, gage height, 33.28 ft; minimum daily discharge, 14 ft<sup>3</sup>/s, Aug. 10-18 and Sept. 8-16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9820	4120	24800	4100	95	520	102	3130	3040	3350	20	253
2	9810	4120	24700	4100	93	510	102	3090	1910	3340	18	253
3	9710	4120	24400	4100	93	506	2020	3090	1070	2660	18	120
4	6190	4100	24200	4090	1550	495	3200	3080	496	2110	19	16
5	2030	4100	23900	4090	3400	342	3200	3810	935	2110	20	16
6	2030	3120	15900	4500	3390	75	3200	5440	1680	2110	16	15
7	2030	4070	9390	6190	3390	66	4500	3550	3060	2110	16	15
8	2030	4050	9390	6200	3390	65	6500	2040	3040	1400	16	14
9	2030	4050	9360	6200	3390	65	7400	2040	1500	454	16	14
10	2020	4040	9360	4090	3390	65	7150	2050	101	454	14	14
11	2880	4040	9600	69	2790	108	7200	2040	1140	258	14	14
12	4040	9600	9420	67	90	1730	7200	3080	3240	112	14	14
13	4050	12300	8520	368	88	5010	7200	5950	3230	90	14	14
14	4250	9350	7300	76	632	5380	7200	6330	3230	3250	14	14
15	6040	3670	7300	2370	1820	5350	6200	6360	3220	8640	14	14
16	9890	59	7280	4400	1810	5330	3000	6470	3180	8540	14	14
17	9860	22	6400	2480	1790	2880	3000	6470	1750	8510	14	1100
18	7880	22	5120	870	2270	844	3020	6580	839	7860	14	3420
19	7560	22	4270	870	3350	836	3020	6630	833	6280	249	3390
20	9980	22	3090	865	3350	833	3020	8780	833	6260	249	3380
21	10700	10700	3090	849	2560	831	3020	11000	833	6260	253	3360
22	11800	18400	3080	849	818	829	2590	11000	833	4500	253	3360
23	11800	18400	3080	834	818	825	3090	11000	828	3090	253	3360
24	11800	18400	3060	553	1250	827	3090	11000	823	3090	253	3340
25	11700	22900	3060	95	1520	825	3090	11000	870	1830	253	2780
26	11700	25700	4890	95	897	820	3090	11000	833	813	253	236
27	11700	25600	9020	411	886	597	3090	9040	1930	818	253	69
28	11700	25600	11800	1060	661	171	3090	6120	3380	424	253	69
29	11800	25000	11700	1030	---	102	3100	5230	3380	83	253	69
30	11800	24800	9260	1030	---	102	3100	3040	3380	43	253	69
31	8650	---	5010	737	---	102	---	3040	---	21	253	---
TOTAL	239280	294497	310750	67638	49581	37041	117784	182480	55417	90870	3566	28816
MEAN	7719	9817	10020	2182	1771	1195	3926	5886	1847	2931	115	961
MAX	11800	25700	24800	6200	3400	5380	7400	11000	3380	8640	253	3420
MIN	2020	22	3060	67	88	65	102	2040	101	21	14	14
AC-FT	474600	584100	616400	134200	98340	73470	233600	361900	109900	180200	7070	57160
CAL YR 1985	TOTAL 2751780	MEAN 7539	MAX 25700	MIN 5.2	AC-FT 5458000							
WTR YR 1986	TOTAL 1477720	MEAN 4049	MAX 25700	MIN 14	AC-FT 2931000							

## 07172500 HULAH LAKE NEAR HULAH, OK

LOCATION.--Lat 36°55'44", long 96°05'18", in SE 1/4 sec.2, T.28 N., R.11 E., Osage County, Hydrologic Unit 11070106, in stair tower at right end of Hulah Dam on Caney River, 0.5 mi downstream from Hickory Creek, 2.0 mi west of Hulah, 15.7 mi upstream from Little Caney River, and at mile 96.2.

DRAINAGE AREA.--732 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1950 to current year. Prior to October 1970, published as Hulah Reservoir near Hulah.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929. Prior to Feb. 15, 1951, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by an earth dam. Spillway is 472-foot concrete ogee-type weir controlled by 10 taintor gates. Outlet works consist of nine rectangular sluices, two 24-inch gated pipes, and one 10-inch water-supply pipe. Closure for diversion made Feb. 6, 1950; regulated storage began Oct. 25, 1950; conservation pool was first filled Sept. 24, 1951. Capacity, 289,000 acre-ft, at elevation 765.0 ft, top of taintor gates, 61,360 acre-ft, at elevation 740.0 ft, crest of spillway, and 31,120 acre-ft, at elevation 733.0 ft, conservation pool. Figures given herein represent total contents. Reservoir is used for flood control, conservation, and municipal water supply. Revised capacity table, based on survey in 1973, used since Oct. 1, 1977.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 293,400 acre-ft, June 23, 1957, elevation, 764.87 ft; minimum since conservation pool was first filled, 11,250 acre-ft, Mar. 20, 1957, elevation, 723.22 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 138,300 acre-ft, June 8, elevation 751.13 ft; minimum, 30,550 acre-ft, Sept. 3, elevation 732.84 ft.

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

727	13,750	743	78,170
732	27,660	749	120,500
737	47,070	756	184,200

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35550	54070	84720	31760	31580	31400	32860	36900	97170	61360	32670	30650
2	34300	52280	81560	32970	31690	31580	39040	35740	95010	57970	32530	30690
3	32750	50660	78660	32750	31760	31660	49530	35060	93970	55610	32450	31400
4	31910	48980	75770	32820	31800	31760	62660	34380	99780	53690	32380	31760
5	32090	47110	72900	32780	31690	31840	66550	33630	115400	51770	32420	31760
6	32340	45230	70100	32490	31580	31940	68920	34150	132300	49930	32380	31800
7	32490	43440	67700	31730	31400	31940	69200	35440	137100	48090	32200	31660
8	32890	41640	64510	31660	31730	31870	67700	41520	137200	46360	40940	31800
9	33190	39800	61720	31840	31690	32020	65520	47600	134800	44460	41520	31760
10	33670	39360	59430	32160	31840	31910	63180	64240	133300	42560	41560	31620
11	34870	41310	57730	32560	31870	32930	61310	67320	136200	40940	40370	31760
12	37570	36090	55130	32670	31980	34980	59930	75590	132100	38960	38760	31910
13	37960	40700	53460	32930	32020	35210	58820	75230	130500	42640	36360	31840
14	49480	47290	52050	33190	32160	34570	59330	75350	121400	46410	34230	31730
15	51120	83450	50620	33220	32230	33860	58570	79760	116100	48220	32890	31730
16	50710	90560	49250	32820	32380	33150	56980	81560	110500	48270	32340	34980
17	49710	95280	47910	32450	32600	32450	56840	119200	106600	47290	31870	35670
18	71980	106600	46580	32050	32640	31840	56050	126600	103200	46140	31550	35520
19	78050	113700	45150	31660	32380	31300	54460	128700	99710	44760	31550	34490
20	79640	115400	44120	31220	32130	31260	52750	127100	96190	43310	31480	33740
21	79390	113800	43570	31120	31840	31400	50940	125100	92600	41680	31440	32820
22	77870	111100	43190	31080	31660	31550	49120	122600	89290	40090	31400	32050
23	76070	108000	43100	31120	31550	31690	47420	119900	88760	38720	31370	31480
24	73880	104900	42560	31220	31370	31840	45410	116900	85560	37020	31300	31400
25	71570	102200	41930	31300	31300	31910	43520	113900	82120	35590	31220	31400
26	69090	99360	41390	31400	31400	32090	41680	110600	78660	34680	31010	31440
27	66660	96470	40170	31400	31300	32200	41310	109400	75060	33670	31010	31440
28	63970	93490	38440	31400	31300	32310	40210	109100	71690	33220	30900	31440
29	61570	90430	36830	31480	---	32340	38880	106700	68200	32930	30690	31620
30	59120	88160	35170	31480	---	32420	37410	103800	64930	32780	30690	31480
31	56300	---	34080	31510	---	32340	---	100500	---	32710	30690	---
MAX	79640	115400	84720	33220	32640	35210	69200	128700	137200	61360	41560	35670
MIN	31910	36090	34080	31080	31300	31260	32860	33630	64930	32710	30690	30650
(+)	738.99	744.58	733.81	733.11	733.05	733.34	734.68	746.37	740.68	733.44	732.88	733.10
(++)	+19,800	+31,860	-54,080	-2,570	-210	+1,040	+5,070	+63,090	-35,570	-32,220	-2,020	+790
CAL YR 1985	MAX 156800	MIN 30770	++	-9,290								
WTR YR 1986	MAX 137200	MIN 30650	++	-5,020								

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET

## 71

LOCATION.--Lat 36°55'34", long 96°05'01", in NE 1/4 NE 1/4 sec.11, T.28 N., R.11 E., Osage County, Hydrologic Unit 11070106, on left bank 1,200 ft downstream from Hulah Dam, 2.1 mi upstream from Opossum Creek, 2.5 mi west of Hulah, and at mile 95.9.

PERIOD OF RECORD.--October 1937 to current year.

GAGE.--Water-stage recorder. Datum of gage is 699.00 ft, National Geodetic Vertical Datum of 1929. Prior to Feb. 18, 1939, nonrecording gage. Feb. 18, 1939 to Sept. 30, 1948, waterstage recorder at county road bridge, 0.2 mi upstream at datum 14.04 ft lower. Oct. 1, 1948 to Sept. 30, 1972, at site 0.6 mi downstream at datum 17.04 ft lower.

AVERAGE DISCHARGE.--(Prior to regulation by Hulah Dam) 13 years (water years 1938-50). 413 ft<sup>3</sup>/s, 299,200 acre-ft/yr; (since regulation by Hulah Dam) 36 years (water years 1951-86). 356 ft<sup>3</sup>/s, 257,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 51,000 ft<sup>3</sup>/s, Apr. 10, 1944, gage height, 39.45 ft, at former site and datum; no flow at times in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 40.2 ft occurred at former site and datum, date unknown, from floodmark, from information by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,190 ft<sup>3</sup>/s, June 13, gage height, 6.39 ft; minimum daily discharge, 2.1 ft<sup>3</sup>/s, Mar. 5 and Aug. 28.

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	932	1320	1870	520	41	2.6	157	966	1950	1790	5.1	3.6
2	925	998	1850	516	41	2.3	176	678	1950	1770	4.9	3.6
3	923	991	1830	297	42	2.3	103	486	1390	1410	4.9	4.0
4	542	982	1770	170	157	2.2	6.4	486	328	929	4.9	4.0
5	3.9	977	1820	169	247	2.1	6.1	486	22	925	5.2	3.9
6	3.7	967	1800	330	247	6.8	6.0	486	17	915	5.1	3.9
7	3.7	958	1780	522	159	21	695	486	15	908	5.4	3.9
8	3.6	941	1770	189	46	52	1440	491	872	901	17	3.7
9	3.0	934	1780	6.1	45	49	1610	503	2140	894	16	3.6
10	3.8	932	1820	5.5	45	97	1590	527	2750	888	16	4.1
11	214	932	1800	5.2	45	173	1230	563	2740	880	488	11
12	395	540	1760	4.9	44	196	1040	571	2900	880	984	14
13	398	25	1400	4.3	44	186	1040	1070	3050	391	976	14
14	416	32	1090	3.7	43	561	376	1160	3030	33	967	14
15	655	40	1070	177	43	534	601	6.7	3020	25	651	14
16	979	23	1060	332	42	534	1030	6.7	3010	551	265	17
17	969	26	1060	332	42	538	391	40	2350	905	265	5.7
18	441	32	1050	332	130	545	638	15	1970	905	125	229
19	623	56	1050	332	256	326	1030	1020	1960	905	7.4	421
20	1040	368	830	329	256	118	1020	2010	1940	901	6.7	418
21	1310	1660	565	160	224	6.8	1010	1980	1930	892	5.7	418
22	1570	2150	555	54	159	6.7	1010	1970	1920	889	5.4	414
23	1560	2240	555	52	159	6.4	1010	1960	1910	884	5.2	266
24	1550	2230	555	47	159	6.3	1000	1960	1900	881	5.2	83
25	1550	1970	535	42	103	6.2	999	1940	1890	730	5.3	5.5
26	1540	1940	534	42	68	6.1	992	1940	1880	475	8.3	5.4
27	1530	1940	826	39	67	6.1	532	952	1860	473	7.3	5.5
28	1510	1940	1040	40	41	5.8	477	1020	1850	283	2.1	5.4
29	1500	1940	1040	41	---	5.8	768	1950	1830	17	3.4	71
30	1500	1940	1030	41	---	5.8	969	1960	1820	13	3.6	163
31	1490	---	748	41	---	67	---	1960	---	5.1	3.6	---
TOTAL	26083.7	32024	38243	5175.7	2995	4077.3	22952.5	31649.4	56194	23248.1	4874.7	2632.8
MEAN	841	1067	1234	167	107	132	765	1021	1873	750	157	87.8
MAX	1570	2240	1870	522	256	561	1610	2010	3050	1790	984	421
MIN	3.0	23	534	3.7	41	2.1	6.0	6.7	15	5.1	2.1	3.6
AC-FT	51740	63520	75850	10270	5940	8090	45530	62780	111500	46110	9670	5220
CAL YR 1985	TOTAL 338813.3	MEAN 928	MAX 3670	MIN .35	AC-FT 672000							

## ARKANSAS RIVER BASIN

07174300 COPAN LAKE NEAR COPAN, OK

LOCATION.--Lat 36°53'13", long 95°57'10", in NW 1/4, NW 1/4 sec.29, T.28 N., R.13 E., Washington County, Hydrologic Unit 11070106, 600 ft northwest of project office, 1.5 mi southwest of Copan and at mile 7.4.

DRAINAGE AREA.--505 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth dam. Spillway is concrete ogee-type weir controlled by 4 taintor gates. A 36-inch diameter low-flow pipe and a 12-inch diameter future water-supply pipe extend through the spillway. Storage began Apr. 1, 1983, conservation pool was first filled Apr. 23, 1983. Capacity 227,700 acre-feet at elevation 732.0 ft, top of flood control pool; 43,400 acre-ft at elevation, 710.0 ft, top of conservation pool. Dead storage 600 acre-ft below elevation 687.5 ft. Figures given herein represent total contents. Reservoir is used for flood control, water conservation, and future water supply.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 153,700 acre-ft, Mar. 7, 1985, elevation, 725.59 ft; minimum since conservation pool first filled, 30,830 acre-ft, Oct. 14, 1983, elevation, 707.17 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 129,200 acre-ft, May 20, elevation, 722.88 ft; minimum, 41,810 acre-ft, Sept. 11, elevation, 709.67 ft.

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

708	34,270	717	84,210
711	48,390	720	105,900
714	65,070	726	158,200

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49430	50570	82720	45460	43930	43300	44230	46260	83190	51310	45610	42530
2	47880	49010	80310	44720	44030	43300	45910	47470	79850	49840	45460	42430
3	46360	47010	78010	44370	44180	43200	52060	47570	78470	48550	45460	42380
4	45210	45310	76580	44230	44180	43150	62000	47420	79390	52860	44870	42380
5	45210	44180	76060	44130	44080	43250	67600	47120	86600	46810	44870	42380
6	45110	43930	74840	44230	44030	43200	70610	46610	94930	46160	45360	42580
7	44720	43880	73310	43930	44030	43200	71920	46960	99100	45360	45360	42340
8	45110	43690	71800	43880	44030	43010	70670	48080	101000	44570	47620	42050
9	45010	43980	70300	44030	44030	43060	68090	51900	100200	43590	48190	41950
10	44910	43930	69130	43980	43980	43350	65070	55030	97260	43150	48490	41950
11	44820	43930	69310	44130	43930	44130	62520	63110	95870	42910	47880	41810
12	45510	46610	68150	44270	43830	47520	60380	71170	93280	42910	47070	42290
13	47170	50570	66270	44370	43790	48860	58380	73060	89730	51530	46210	42240
14	45310	52970	64890	44470	43790	48030	56970	84550	85920	68390	45360	42190
15	52060	72240	63700	44420	43790	47010	55360	93640	81510	75160	44770	42190
16	51630	86120	62000	44370	43830	45810	53080	96530	77550	76840	44720	50680
17	50520	93920	60660	44180	43830	44320	51900	116100	73500	76320	44520	53890
18	53780	99900	59120	44030	43930	43540	51210	123900	70800	74330	44320	54000
19	59400	108600	57650	43880	43930	43350	49630	128500	67290	72110	44180	52750
20	62410	112800	56470	43590	43980	43350	47680	129200	64590	69000	44030	51100
21	63520	112200	55920	43540	43790	43200	46110	127400	62700	65960	43740	49370
22	63700	110000	55360	43490	43790	43300	44570	124500	60840	60380	43490	48080
23	63350	106900	54760	43350	43830	43490	43490	120900	59460	62230	43540	46660
24	62460	103300	54110	43350	43740	43450	43690	116600	57590	61710	43250	46110
25	61180	99620	53240	43450	43740	43640	43830	111900	55860	59340	43150	44470
26	59800	96310	52700	43490	43790	43790	43880	107300	53940	56030	43150	44370
27	58380	93140	51530	43490	43690	43790	44370	104000	52060	52490	43150	44620
28	56810	90010	50000	43640	43400	43790	44470	100600	54110	50120	42960	44520
29	55470	87290	48140	43690	---	43980	44230	92560	53780	48550	42820	56690
30	53890	85300	46960	43740	---	43980	44270	91920	52590	47010	42620	56750
31	52220	---	46210	43790	---	43880	---	87850	---	45860	42620	---
MAX	63700	112800	82720	45460	44180	48860	71920	129200	101000	76840	48490	56750
MIN	44720	43690	46210	43350	43400	43010	43490	46260	52060	42910	42620	41810
(+)	711.73	717.16	710.57	710.08	710.08	710.10	710.18	417.53	711.80	710.50	709.84	712.56
(++)	+2,740	+33,080	-39,090	-2,420	-390	+480	+390	+43,580	-35,260	-6,730	-3,240	+14,130
CAL YR 1985	MAX	153500	MIN	42640	(++)	-7,670						
WTR YR 1986	MAX	129200	MIN	41810	(++)	+7,270						

(+) ELEVATION, IN FEET, AT END OF MONTH  
(++) CHANGE IN CONTENTS, IN ACRE-FEET



## ARKANSAS RIVER BASIN

73

07174400 CANEY RIVER ABOVE COON CREEK AT BARTLESVILLE, OK

LOCATION.--Lat 36°45'20", long 95°58'21", in NE 1/4 NE 1/4 sec.12, T.26 N, R.12 E, Washington County, Hydrologic Unit 11070103, at right bank in city of Bartlesville water intake tower, .2 mi upstream from State Highway 123 bridge and low-water dam, .5 mi downstream from Atchison, Topeka, and Santa Fe railroad bridge, 1.0 mi upstream from confluence with Coon Creek, 2.7 mi downstream from confluence with Butler Creek, 5.0 mi upstream from confluence with Sand Creek, and at river mile 69.2.

DRAINAGE AREA.--1,392 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1, 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 653.33 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 19 to Jan 28. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Considerable regulation by Hulah Lake (station 07172500) 27 mi upstream, and Copan Lake (station 07174300) 12 mi upstream. Diversion by city of Bartlesville, at gage for municipal water supply.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,100 ft<sup>3</sup>/s, Sept. 30, 1986, gage height, 18.25 ft; minimum daily discharge, 11 ft<sup>3</sup>/s, Mar. 6, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,100 ft<sup>3</sup>/s, Sept. 30, gage height, 18.25 ft; minimum daily discharge, 11 ft<sup>3</sup>/s, Mar. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1810	2360	3110	1050	53	137	218	1040	4400	3140	287	22
2	1930	1950	3070	980	53	91	511	1040	4350	3100	103	22
3	1930	1820	3020	880	53	85	1410	901	3960	3030	95	22
4	1780	1810	2930	440	61	80	2170	874	4270	1810	95	20
5	519	1710	2340	370	386	26	510	865	2740	1510	95	18
6	131	1330	2340	370	451	11	220	864	1490	1490	113	18
7	115	1090	2630	550	454	13	223	864	583	1480	102	18
8	114	1050	2650	530	256	21	1680	864	510	1470	5680	18
9	114	1020	2650	200	155	56	2600	905	2750	1440	750	18
10	112	995	2650	100	154	66	2980	1020	4640	1390	188	27
11	117	994	2700	105	148	173	2900	1210	5250	1100	154	29
12	509	1230	2760	100	147	985	2260	1030	5350	1060	1350	20
13	608	2480	2930	80	144	771	2170	1050	5670	2810	1530	22
14	756	5940	2140	60	141	785	2070	2330	5780	816	1530	24
15	826	8380	1970	70	141	1260	1050	2100	5770	212	1500	42
16	1690	2220	1940	340	141	1200	1920	245	5700	662	650	4250
17	1720	388	1930	430	141	1190	1900	2240	5200	2580	445	2620
18	1890	384	1900	420	141	1170	757	945	4280	3230	433	256
19	736	796	1850	415	284	890	1630	562	4100	3270	193	1200
20	1400	736	1700	420	370	381	1730	3180	4000	3270	106	1330
21	1840	2380	1200	400	371	204	1740	4090	3380	3250	101	1330
22	2300	4050	1100	250	325	55	1740	4250	3280	3140	91	1330
23	2390	4180	1090	155	281	24	1640	4300	3270	2360	35	1270
24	2390	4140	1070	150	281	22	1090	4290	3270	1300	26	795
25	2390	4080	1040	100	280	19	1010	4270	3250	1990	25	622
26	2360	3930	1020	70	201	18	987	4230	3240	2600	24	576
27	2350	3610	1150	65	175	18	986	4000	3210	2640	27	172
28	2380	3510	1750	61	170	18	318	2220	3190	2500	29	22
29	2380	3460	1850	63	---	18	839	3930	3170	1280	25	3280
30	2370	3190	1780	55	---	18	973	4350	3170	1060	24	18500
31	2370	---	1420	53	---	18	---	4370	---	1000	22	---
TOTAL	44327	75213	63680	9332	5958	9823	42232	68429	113223	61990	15828	37893
MEAN	1430	2507	2054	301	213	317	1408	2207	3774	2000	511	1263
MAX	2390	8380	3110	1050	454	1260	2980	4370	5780	3270	5680	18500
MIN	112	384	1020	53	53	11	218	245	510	212	22	18
AC-FT	87920	149200	126300	18510	11820	19480	83770	135700	224600	123000	31390	75160

WTR YR 1986 TOTAL 547928 MEAN 1501 MAX 18500 MIN 11 AC-FT 1087000

## ARKANSAS RIVER BASIN

## 07174600 SAND CREEK AT OKESA, OK

LOCATION.--Lat 36°43'10", long 96°07'56", in NW 1/4 NW 1/4 sec.21, T.26 N., R.11 E., Osage County, Hydrologic Unit 11070106, on downstream side of left abutment of county road bridge, 0.5 mi northeast of Okesa, 9 mi southwest of Bartlesville, and at mile 17.2.

DRAINAGE AREA.--139 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 689.20 ft, National Geodetic Vertical Datum of 1929. Prior to May 25, 1960, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--27 years, 76.6 ft<sup>3</sup>/s, 55,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,700 ft<sup>3</sup>/s, Sept. 30, 1986, gage height, 26.44 ft; maximum gage height, 27.7 ft, Sept. 13, 1961, from floodmarks; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft<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. 18	1415	6,250	15.96	May 17	0730	5,210	14.60
Nov. 13	1615	5,060	14.40	June 4	1230	9,270	19.44
Nov. 15	1000	7,270	17.20	July 13	1445	3,650	11.54
Nov. 19	1415	3,720	12.43	Sept. 30	0600	*16,700	12.32
Apr. 4	0345	4,200	13.15				

Minimum daily discharge, 0.98 ft<sup>3</sup>/s, Sept. 7-9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	86	26	49	21	11	9.7	14	20	31	10	2.2	1.4
2	45	23	43	21	11	8.8	330	17	27	9.6	2.0	1.3
3	32	19	36	21	12	8.4	1200	16	36	8.6	1.8	1.3
4	25	17	34	20	14	8.2	1890	16	4040	7.3	1.4	1.3
5	19	15	36	19	14	7.8	286	16	1230	6.1	1.5	1.3
6	16	13	39	18	15	7.5	194	15	699	5.3	2.0	1.3
7	14	12	41	17	15	7.1	130	14	253	4.6	1.9	.98
8	12	11	41	17	15	7.3	92	13	175	4.2	566	.98
9	10	11	39	16	15	7.6	64	38	93	3.6	60	.98
10	9.2	11	37	15	15	7.5	48	430	93	3.1	22	1.8
11	9.2	11	65	15	15	46	42	870	92	2.6	14	3.6
12	12	527	85	15	13	673	38	191	68	2.5	11	2.2
13	31	1550	56	16	13	185	35	98	45	1140	9.1	1.5
14	159	1720	46	16	13	92	271	66	32	196	8.3	1.1
15	172	3860	40	16	13	58	106	129	24	55	7.8	1.2
16	74	424	38	16	13	44	53	167	20	29	7.4	190
17	45	208	40	16	13	39	43	2400	18	18	6.9	142
18	2130	811	41	16	14	44	46	287	16	14	6.3	46
19	430	1480	39	16	14	40	48	133	15	11	5.6	23
20	155	333	35	16	14	33	42	81	14	9.6	5.1	15
21	92	164	33	16	14	27	34	58	12	8.0	4.5	12
22	64	122	31	15	13	22	29	47	11	6.4	3.8	9.7
23	51	95	33	14	12	20	25	40	115	5.5	3.3	8.5
24	43	78	34	14	12	19	22	34	91	5.2	2.7	7.4
25	34	69	33	13	12	17	20	32	38	4.9	2.5	6.4
26	28	69	27	12	11	17	18	30	23	5.3	2.1	6.1
27	25	69	24	12	9.9	16	22	33	17	5.0	2.5	5.9
28	22	57	23	12	9.8	15	33	34	15	4.1	2.2	5.3
29	20	50	23	11	---	14	24	115	13	3.3	1.8	3700
30	19	45	22	12	---	14	21	57	12	2.9	1.6	12900
31	25	---	21	11	---	14	---	38	---	2.4	1.4	---
TOTAL	3908.4	11900	1184	485	365.7	1528.9	5220	5535	7368	1593.1	770.7	17099.54
MEAN	126	397	38.2	15.6	13.1	49.3	174	179	246	51.4	24.9	570
MAX	2130	3860	85	21	15	673	1890	2400	4040	1140	566	12900
MIN	9.2	11	21	11	9.8	7.1	14	13	11	2.4	1.4	.98
AC-FT	7750	23600	2350	962	725	3030	10350	10980	14610	3160	1530	33920

CAL YR 1985 TOTAL 81193.20 MEAN 222 MAX 6910 MIN .00 AC-FT 161000  
WTR YR 1986 TOTAL 56958.09 MEAN 156 MAX 12900 MIN .98 AC-FT 113000

## ARKANSAS RIVER BASIN

75

## 07175500 CANEY RIVER NEAR RAMONA, OK

LOCATION.--Lat 36°30'31", long 95°50'36", in NE 1/4 NW 1/4 sec.5, T.23 N., R.14 E., Washington County, Hydrologic Unit 11070106, on left bank near downstream abutment of county road bridge, 1 mi upstream from Buck Creek, 2.2 mi downstream from Double Creek, 4.5 mi southeast of Ramona, and at mile 32.0.

DRAINAGE AREA.--1,955 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1945 to current year. Monthly discharge only for some periods, published in WSP 1311. Previous reports have included Caney River near Collinsville from Oct. 1935 to Feb. 1939; this record has been separated from Ramona.

REVISED RECORDS.--WSP 1117: Drainage area. WSP 1241: 1939.

GAGE.--Water-stage recorder. Datum of gage is 586.43 ft, National Geodetic Vertical Datum of 1929. Sept. 1, 1945 to Feb. 15, 1946, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Nov. 13, 14, Dec. 1-5, Feb. 13-18, and Sept. 17-22. Records fair. Regulation since February 1950 by Hulah Lake (station 07172500) and since April 1983 by Copan Lake (station 07174300).

AVERAGE DISCHARGE.--Since regulation by Hulah Reservoir, 32 years (water years 1951-1982), 925 ft<sup>3</sup>/s, 670,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 43,000 ft<sup>3</sup>/s, Sept. 30, 1986, gage height, 29.14 ft, stage rising, peak on Oct. 5, 1987; maximum gage height, 30.12 ft, Oct. 3, 1945; no flow Sept. 11 to Nov. 3, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 43,000 ft<sup>3</sup>/s, Sept. 30, gage height, 29.14 ft, stage rising, peak on Oct. 5, 1987; minimum daily discharge, 40 ft<sup>3</sup>/s, Sept. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2260	2600	3660	1510	127	228	97	1340	4450	2900	793	59
2	2220	2530	3470	1100	134	207	281	1380	4410	2870	259	59
3	2270	2150	3290	1020	166	158	1520	1330	4410	2830	116	59
4	2200	1980	3200	893	203	140	5860	1110	4470	2600	100	59
5	1910	1950	3050	480	168	135	6090	1080	7360	1700	100	59
6	634	1820	2600	392	382	97	2270	1080	8490	1490	109	54
7	245	1440	2600	393	506	64	1260	1060	5230	1480	130	48
8	208	1150	2830	613	491	56	1140	1060	1930	1460	2330	44
9	195	1100	2860	606	360	57	2530	1110	1490	1450	7540	41
10	190	1060	2950	286	275	94	3280	1380	3160	1430	3480	40
11	191	1030	3330	152	255	167	3580	3060	4510	1320	585	170
12	215	1710	3300	184	239	2500	3420	3160	5030	1040	469	167
13	514	5100	3170	129	223	3010	2840	1770	5150	4500	1470	95
14	1070	7800	2990	112	214	1500	3170	1780	5290	7970	1590	74
15	1550	11500	2440	102	209	1190	3150	4810	5360	3450	1550	88
16	1370	11600	2170	128	203	1440	1930	3770	5330	844	1390	1950
17	1870	10300	2130	415	198	1350	2540	3070	5250	1150	578	9850
18	2430	6060	2120	530	190	1320	2280	6660	4850	2470	392	7200
19	4440	6640	2080	522	249	1260	1350	3820	4100	2860	371	2110
20	2870	5990	2040	519	330	909	2180	2010	3840	2870	200	1820
21	2020	3000	1890	521	392	441	2290	3820	3630	2840	145	1700
22	2300	3350	1300	490	389	314	2250	4390	3170	2820	151	1580
23	2630	4590	1170	320	352	154	2210	4650	3200	2630	140	1540
24	2710	4820	1170	254	318	132	2010	4660	3150	1970	98	1300
25	2690	4790	1140	249	317	119	1440	4620	3160	1340	70	828
26	2650	4740	1120	200	313	109	1320	4590	3050	1870	62	993
27	2620	4570	1100	145	264	113	1290	4550	3000	2220	66	3310
28	2600	4080	1250	127	245	100	1250	4120	2970	2240	71	934
29	2630	3840	1850	128	---	94	542	3020	2940	1970	73	4050
30	2660	3730	1940	125	---	89	1110	4190	2920	1120	65	33500
31	2610	---	1870	128	---	82	---	4490	---	917	61	---
TOTAL	56972	127020	72080	12776	7712	17629	66480	92940	125300	70621	24554	73781
MEAN	1838	4234	2325	412	275	569	2216	2998	4177	2278	792	2459
MAX	4440	11600	3660	1510	506	3010	6090	6660	8490	7970	7540	33500
MIN	190	1030	1100	102	127	56	97	1060	1490	844	61	40
AC-FT	113000	251900	143000	25340	15300	34970	131900	184300	248500	140100	48700	146300
CAL YR 1985	TOTAL	1092826		MEAN	2994	MAX	24300	MIN	42	AC-FT	2168000	
WTR YR 1986	TOTAL	747865		MEAN	2049	MAX	33500	MIN	40	AC-FT	1483000	

## ARKANSAS RIVER BASIN

07175500 CANEY RIVER NEAR RAMONA, OK--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1952-53, 1955-62, 1965 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1966 to April 1982.

WATER TEMPERATURE: October 1966 to April 1982.

REMARKS.--Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	
OCT 28...	1430	1028	80020	11.98	2580	315	7.30	20.5	19.0	746	8.8	
NOV 26...	1145	1028	80020	17.83	4750	--	7.00	10.0	9.5	742	--	
DEC 09...	1505	1028	80020	12.84	2900	350	7.00	8.5	5.5	750	11.8	
JAN 15...	1500	1028	80020	3.22	95	720	7.90	16.0	6.0	--	--	
FEB 27...	1300	1028	80020	3.97	251	610	7.80	16.0	11.0	750	12.4	
MAR 27...	1440	1028	80020	3.35	114	--	8.40	22.0	19.5	753	10.2	
APR 29...	1500	1028	80020	4.32	363	495	7.75	26.0	21.0	739	7.7	
JUN 04...	1530	1028	80020	15.45	4240	308	7.70	27.5	24.0	740	8.0	
24...	1400	1028	80020	12.33	3090	328	7.58	31.5	26.0	747	7.4	
JUL 17...	1530	1028	80020	6.65	1240	368	7.67	36.0	29.0	746	5.6	
AUG 20...	1530	1028	80020	3.75	197	405	7.87	34.0	29.0	744	6.9	
SEP 22...	1200	1028	80020	7.72	1600	298	7.86	29.5	24.5	746	7.3	
DATE		OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	HARD-NESS (MG/L AS CaCO3)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE IT-FLD (MG/L AS HCO3)	CAR-BONATE IT-FLD (MG/L AS CO3)
OCT 28...	97	120	0	40	5.7	12	17	0.5	3.2	186	0	0
NOV 26...	--	120	27	37	5.4	13	19	0.6	3.3	107	0	0
DEC 09...	95	130	21	42	6.1	13	17	0.5	2.8	133	0	0
JAN 15...	--	240	62	74	12	48	31	1	2.5	--	--	--
FEB 27...	114	230	34	71	12	43	29	1	2.5	237	0	0
MAR 27...	113	240	68	74	13	49	31	1	2.6	--	--	--
APR 29...	89	190	13	60	10	25	22	0.8	2.4	218	0	0
JUN 04...	98	130	21	40	6.2	16	21	0.6	3.3	128	0	0
24...	93	130	10	41	5.7	12	17	0.5	2.8	142	0	0
JUL 17...	75	110	24	34	5.6	24	32	1	3.8	102	0	0
AUG 20...	92	160	24	50	8.0	18	20	0.6	3.0	163	0	0
SEP 22...	90	110	12	34	5.2	14	22	0.6	3.2	116	0	0

## ARKANSAS RIVER BASIN

07175500 CANEY RIVER NEAR RAMONA, OK--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	ALKA- LITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEC. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N03)
OCT 28...	152	15	17	16	7.7	173	200	0.24	1210	0.360	1.6
NOV 26...	88	17	22	20	8.5	164	160	0.22	2100	--	--
DEC 09...	109	21	14	23	8.8	187	180	0.25	1460	0.300	1.3
JAN 15...	--	4.2	26	81	9.0	367	360	0.50	94	0.340	--
FEB 27...	194	6.0	23	80	5.2	364	350	0.50	247	0.230	--
MAR 27...	--	1.3	45	98	4.3	403	390	0.55	124	--	--
APR 29...	179	6.2	25	43	7.3	280	280	0.38	274	0.280	--
JUN 04...	105	4.1	21	18	12	209	180	0.28	2390	0.300	1.3
JUN 24...	116	5.9	14	13	8.3	170	170	0.23	1420	0.080	--
JUL 17...	84	3.5	23	43	7.0	196	190	0.27	656	--	--
AUG 20...	134	3.5	15	37	7.1	228	220	0.31	121	--	--
SEP 22...	95	2.5	15	22	5.9	205	160	0.28	886	--	--
DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N02)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)
OCT 28...	0.010	0.03	0.370	0.040	0.05	0.020	0.06	--	1	66	<0.5
NOV 26...	<0.010	--	0.310	0.050	0.06	0.020	0.06	--	<1	60	<0.5
DEC 09...	0.010	0.03	0.310	0.060	0.08	0.030	0.09	--	<1	61	<0.5
JAN 15...	0.040	0.13	0.380	0.100	0.13	<0.010	--	--	<1	100	<0.5
FEB 27...	0.010	0.03	0.240	0.020	0.03	0.060	0.18	--	<1	98	<0.5
MAR 27...	<0.010	--	0.110	0.040	0.05	<0.010	--	--	<1	110	<0.5
APR 29...	0.030	0.10	0.310	0.120	0.15	0.060	0.18	--	1	90	<0.5
JUN 04...	0.030	0.10	0.330	0.050	0.06	0.030	0.09	--	2	95	1
JUN 24...	0.020	0.07	0.100	0.030	0.04	0.030	0.09	--	2	64	1
JUL 17...	--	--	<0.100	--	--	--	--	--	1	69	0.6
AUG 20...	--	--	--	--	--	--	--	30	<1	60	<5
SEP 22...	<0.010	--	0.400	0.020	0.03	0.040	0.12	--	1	72	<0.5



07175500 CANEY RIVER NEAR RAMONA, OK--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)
OCT 28...	<1	<10	<3	<10	47	<10	5	4	0.1	<10
NOV 26...	<1	<10	<3	<10	100	<10	5	17	--	<10
DEC 09...	<1	<10	<3	<10	88	30	5	26	<0.1	<10
JAN 15...	<1	<10	<3	<10	13	<10	11	440	0.2	<10
FEB 27...	1	<10	<3	<10	27	<10	12	130	0.1	<10
MAR 27...	<1	<10	<3	<10	5	<10	10	160	--	<10
APR 29...	<1	<10	<3	<10	470	10	<4	92	0.5	<10
JUN 04...	2	<10	<3	--	1700	<10	6	180	0.1	<10
24...	<1	<10	<3	<10	300	20	8	54	<0.1	<10
JUL 17...	4	<10	<3	10	82	<10	7	15	--	<10
AUG 20...	<1	<1	<1	5	<10	<5	<10	20	0.3	<1
SEP 22...	<1	<10	<3	<10	78	<10	<4	10	<0.1	<10

DATE	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 28...	--	--	280	<6	18
NOV 26...	--	--	280	<6	8
DEC 09...	--	--	300	<6	10
JAN 15...	--	--	690	<6	24
FEB 27...	--	--	710	<6	33
MAR 27...	--	--	720	<6	9
APR 29...	--	--	460	<6	24
JUN 04...	--	--	310	<6	85
24...	--	--	280	<6	10
JUL 17...	--	--	320	<6	31
AUG 20...	<1	<1	390	1	50
SEP 22...	--	--	280	<6	110

## ARKANSAS RIVER BASIN

79

## 07176000 VERDIGRIS RIVER NEAR CLAREMORE, OK

LOCATION.--Lat 36°18'26", long 95°41'52", SE 1/4 SW 1/4 sec.10, T.21 N., R.15 E., Rogers County, Hydrologic Unit 11070105, on left bank on downstream side of bridge on State Highway 20, 2.3 mi downstream from Caney River, 4.5 mi west of Claremore, 12.4 mi upstream from Bird Creek, and at mile 76.0.

DRAINAGE AREA.--6,534 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1935 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 538.62 ft, National Geodetic Vertical Datum of 1929. Prior to Feb. 24, 1939, and May 17 to Aug. 24, 1967, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 28-31, Nov. 7-12, Nov. 17 to Dec. 2, Dec. 7, 8, 10, 13-28, Dec. 31 to Jan. 13. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated since May 1963 by Oologah Lake 14.3 mi upstream (station 07171300); some regulation by dams in Kansas since 1949 and by Hulah Lake since 1950 (station 07172500).

AVERAGE DISCHARGE.--(Prior to regulation by Oologah Lake) 27 years (water years 1936-62), 3,723 ft<sup>3</sup>/s, 2,695,000 acre-ft/yr; (since regulation by Oologah Lake) 22 years (water years 1965-86), 4,138 ft<sup>3</sup>/s, 2,998,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 182,000 ft<sup>3</sup>/s May 21, 1943, gage height, 55.05 ft; no flow at times in 1936, 1939-40, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 30,000 ft<sup>3</sup>/s Nov. 27; minimum daily discharge, 56 ft<sup>3</sup>/s Sept. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8370	6700	29200	5800	283	772	230	5120	7780	6310	827	333
2	11300	6680	28700	5400	260	736	244	4700	6970	6300	606	333
3	11400	6510	26800	5300	255	707	1670	4580	6690	5830	260	284
4	8970	6140	26400	5200	1620	683	9060	4440	6860	4990	156	96
5	4390	6060	26100	4800	3800	637	10800	4710	7940	4400	137	80
6	3770	5180	21900	5500	3790	270	9360	6520	11200	3720	137	75
7	2730	5700	12400	6500	4080	218	6500	5090	11600	3620	138	68
8	2440	5400	12100	6700	4180	182	7810	3190	7440	3180	252	63
9	2380	5300	12000	6700	4120	168	9300	3180	3590	1850	5910	61
10	2370	5300	12100	4100	3940	165	10500	3350	2210	1830	6890	58
11	2910	5300	14400	1000	3410	193	11100	4070	4660	1680	1650	56
12	4510	9600	13300	1000	436	4100	11300	6390	8560	1240	482	106
13	4560	19000	12300	500	360	9840	10800	8290	8930	5190	795	173
14	5880	20200	10200	251	531	8890	10600	7900	9040	9720	1460	111
15	7420	18000	10000	1690	2270	7430	10100	8990	9190	15100	1490	101
16	11000	12500	9700	4740	2250	7340	5750	11700	9040	10400	1450	278
17	11200	10800	8700	3260	2250	5790	5220	11200	7760	8920	991	6250
18	10600	6600	7200	1520	2590	2620	5750	12000	6580	9300	464	12000
19	11000	7200	6400	1630	4060	2560	4950	13100	5810	8730	615	9110
20	14400	6500	5400	1630	3990	2370	4890	10800	5090	8900	603	5240
21	12700	12800	5300	1610	3630	1900	5470	13300	4910	8860	472	5210
22	13800	21500	4600	1600	1400	1480	5150	14700	4490	7400	414	5010
23	14100	22800	4500	1510	1380	1310	5430	15300	4160	5910	400	4900
24	14300	23000	4500	1150	1670	1190	5360	15400	4160	5460	398	4820
25	14400	27500	4500	377	2200	1130	4950	15400	4140	3860	371	3700
26	14300	29000	5900	352	1390	1090	4510	15300	4090	2360	345	1390
27	14300	30000	10000	445	1370	950	4450	14100	4900	2940	342	4040
28	14300	29500	12500	1360	1220	525	4430	10700	6470	2880	334	2700
29	14300	29300	12800	1320	---	241	4240	9150	6410	2210	333	2320
30	14300	29200	12700	1300	---	233	3910	6600	6370	1570	333	18700
31	9800	---	7100	1150	---	224	---	7630	---	926	333	---
TOTAL	292200	429270	389700	85395	62735	65944	193834	276900	197040	165586	29388	87666
MEAN	9426	14310	12570	2755	2241	2127	6461	8932	6568	5341	948	2922
MAX	14400	30000	29200	6700	4180	9840	11300	15400	11600	15100	6890	18700
MIN	2370	5180	4500	251	255	165	230	3180	2210	926	137	56
AC-FT	579600	851500	773000	169400	124400	130800	384500	549200	390800	328400	58290	173900
CAL YR 1985	TOTAL	3832158	MEAN	10500	MAX	30000	MIN	56	AC-FT	7601000		
WTR YR 1986	TOTAL	2275658	MEAN	6235	MAX	30000	MIN	56	AC-FT	4514000		

## ARKANSAS RIVER BASIN

07176460 BIRCH LAKE NEAR BARNSDALL, OK

LOCATION.--Lat 36°32'05", long 96°09'45", in NW 1/4 NE 1/4 sec.30, T.24 N., R.11 E., Osage County, Hydrologic Unit 11070107, 450 ft north of dam on Birch Creek, 1.5 mi south of Barnsdall and at mile 0.8.

DRAINAGE AREA.--66.0 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929. Prior to May 31, 1977 nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earth dam with uncontrolled concrete spillway. Storage began Mar. 18, 1977; conservation pool was first filled Mar. 23, 1978. The outlet work is a gated intake structure. Capacity, 58,180 acre-ft at elevation 774.0 ft, crest of uncontrolled spillway and 19,180 acre-ft at elevation 750.5 ft, top of conservation pool. Dead storage, 3,360 acre-ft below elevation 730.0 ft. Figures given herein represent total contents. Reservoir is used for flood control, water supply, water quality, recreation, and fish and wildlife.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 37,560 acre-ft, Sept. 30, 1986, elevation, 763.75 ft; minimum since conservation pool was first filled, 13,080 acre-ft, Oct. 26-29, 1977, elevation, 744.68 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 37,560 acre-ft, Sept. 30, elevation, 763.75 ft; minimum, 17,980 acre-ft, Sept. 13, 14, elevation, 749.43 ft.

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

750	18,620	758	28,650
751	19,750	763	36,300
754	23,350	764	37,990

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19000	19320	19930	18920	18370	18440	19520	18820	19260	19250	18540	18220
2	19010	19320	19870	18890	18380	18440	20720	18800	19270	19230	18500	18220
3	18990	19320	19810	18860	18390	18430	21580	18760	19270	19190	18470	18200
4	18970	19310	19750	18830	18410	18410	21670	18740	21030	19160	18450	18190
5	18930	19290	19680	18800	18410	18410	21790	18830	21360	19120	18440	18170
6	18920	19260	19640	18750	18410	18390	21870	18810	22400	19080	18410	18140
7	18910	19260	19570	18740	18430	18380	21330	18800	22610	19080	18370	18070
8	18890	19240	19500	18710	18430	18430	20800	18830	22660	19040	18500	18060
9	18870	19210	19490	18680	18430	18430	20250	18830	22670	19020	18780	18040
10	18890	19190	19470	18660	18440	18480	19850	20420	22380	18990	18810	18080
11	18910	19160	19430	18640	18430	19800	20190	20510	21900	18940	18810	18050
12	18990	22120	19370	18600	18430	19480	20150	20530	21210	18900	18800	18010
13	18990	25200	19340	18590	18440	19210	19560	20370	20630	19160	18770	17980
14	20490	27810	19280	18570	18440	19210	19520	20180	20150	19180	18740	17980
15	20330	30850	19270	18560	18460	19210	19440	19960	19970	19160	18750	18030
16	20010	31070	19250	18550	18470	19210	19400	19710	19720	19150	18730	19240
17	19580	31130	19240	18530	18470	19240	19370	21310	19500	19100	18690	19350
18	21210	31630	19230	18480	18470	19240	19360	21370	19350	19060	18680	19360
19	20920	31310	19200	18470	18470	19200	19270	21310	19340	19020	18660	19350
20	20510	30780	19190	18470	18470	19180	19230	20990	19290	18990	18630	19330
21	20150	29140	19180	18440	18460	19170	19160	20070	19270	18920	18570	19310
22	19680	27950	19150	18410	18460	19140	19140	20260	19230	18900	18540	19290
23	19360	25140	19110	18410	18470	19280	19100	20010	19330	18870	18510	19260
24	19350	23080	19090	18380	18470	19110	18910	19880	19390	18840	18490	19240
25	19350	21610	19080	18380	18470	19200	18910	19680	19360	18810	18480	19200
26	19350	20290	19060	18360	18470	19160	18870	19500	19330	18780	18440	19180
27	19350	20170	19030	18360	18460	19150	18910	18760	19290	18760	18400	19160
28	19340	20110	19000	18360	18450	19060	18870	18740	19290	18730	18360	19120
29	19350	20040	18980	18350	---	19040	18870	18710	19270	18680	18310	29070
30	19350	20010	18970	18350	---	19020	18850	18710	19240	18650	18280	37560
31	19340	---	18940	18360	---	19090	---	18690	---	18580	18250	---
MAX	21210	31630	19930	18920	18470	19800	21870	21370	22670	19250	18810	37560
MIN	18870	19160	18940	18350	18370	18380	18850	18690	19230	18580	18250	17980
(+)	750.64	751.22	750.29	749.77	749.85	750.42	750.21	750.07	750.55	749.97	749.67	763.75
(++)	+320	+670	-1,770	-580	+90	+640	-240	-160	+550	-660	-330	+19,310
CAL YR 1985	MAX	36280	MIN	18400	(++)	-3,940						
WTR YR 1986	MAX	37560	MIN	17980	(++)	+18,540						

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET

LOCATION.--Lat 36°32'08", long 96°09'38", NW 1/4 NE 1/4 sec.30, T.24 N., R.11 E., Osage County, Hydrologic Unit 11070107, 300 ft downstream from Birch Dam, 1.5 mi south of Barnsdall, and at mile 0.7.

PERIOD OF RECORD.--February 1977 to current year.

REVISED RECORDS.--WDR OK-86-1: 1984-85.

REMARKS.--Estimated daily discharges: Oct. 18-20, Nov. 12 to Jan. 24, Mar. 11, Apr. 3-4, May 17, June 4-11, July 10-16, and Sept. 29-30. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow completely regulated since March 1977 by Birch Lake (station 0716460).

AVERAGE DISCHARGE.--9 years, 40.1 ft<sup>3</sup>/s, 29,050 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,690 ft<sup>3</sup>/s, June 13, 1985, gage height, 11.50 ft; maximum gage height, 26.40 ft, June 10, 1985 (backwater from Bird Creek); no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,030 ft<sup>3</sup>/s, Nov. 21; maximum gage height, 22.64 ft, Sept. 30 (backwater from Bird Creek); minimum daily discharge, 0.80 ft<sup>3</sup>/s, Feb. 15.

REVISIONS.--Revised daily discharges, in cubic feet per second, for periods December 1983 and January 1984 are given below. These figures supersede those published in the reports for 1984 and 1985.

Dec. 23...2.2	Dec. 26...2.0	Dec. 29...2.0	Jan. 1....2.0
24...2.2	27...2.0	30...2.0	2....2.0
25...2.2	28...2.0	31...2.0	3....2.0

	TOTAL	MEAN	MAX	MIN	AC-FT
December 1983	366.4	11.8	86	1.6	727
January 1984	64.2	2.07	2.2	1.6	127
Cal Yr 1983	15,282.81	41.9	600	.00	30,310
Wtr Yr 1984	18,015.07	49.2	569	.00	35,730
Cal Yr 1984	19,383.34	53.0	569	.00	38,450

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	1.0	25	1.0	1.0	1.1	4.2	11	11	5.3	6.1	7.2
2	1.2	1.1	25	1.0	1.0	1.2	4.1	11	11	4.8	6.1	7.2
3	1.2	1.1	25	1.0	1.0	1.3	4.1	11	11	7.6	6.1	7.2
4	1.0	1.1	25	1.0	1.0	1.3	4.1	11	11	7.6	6.1	7.2
5	1.1	1.1	25	1.0	.99	1.3	4.1	11	12	7.6	6.1	7.2
6	1.0	1.1	25	1.0	.90	1.3	4.1	10	11	7.6	6.1	7.2
7	.92	1.1	25	1.0	.90	1.3	116	10	11	7.6	6.1	7.2
8	.90	1.1	25	1.0	.90	1.3	252	10	11	7.6	7.5	7.2
9	1.0	1.1	25	1.0	.90	1.2	250	10	70	7.6	7.8	7.2
10	1.1	1.1	25	1.0	.90	1.3	212	9.8	123	7.6	7.2	7.3
11	1.1	1.1	25	1.0	.90	1.3	101	10	287	7.6	7.2	7.6
12	1.1	1.1	25	1.0	.90	62	28	10	268	7.6	7.2	7.6
13	1.1	1.3	25	1.0	.90	172	28	74	188	7.8	7.2	7.6
14	1.7	1.4	25	1.0	.81	63	28	122	72	7.6	7.2	7.6
15	67	1.3	25	1.0	.80	6.4	28	121	72	7.6	7.2	7.6
16	164	1.1	10	1.0	.84	6.4	28	97	72	7.6	7.2	8.9
17	161	1.1	1.0	1.0	.93	6.4	28	28	47	7.6	7.2	7.6
18	160	1.1	1.0	1.0	1.2	5.9	29	13	10	7.6	7.2	7.6
19	160	5.0	1.0	1.0	1.2	5.4	29	50	9.2	7.6	7.2	7.6
20	155	568	1.0	1.0	1.0	5.5	29	117	8.9	7.6	7.2	7.6
21	147	1030	1.0	1.0	1.0	5.7	19	115	8.9	7.6	7.2	7.6
22	165	927	1.0	1.0	.94	5.7	13	115	8.9	7.6	7.2	7.6
23	100	888	1.0	1.0	.98	5.7	13	97	9.4	7.6	7.2	7.6
24	2.4	887	1.0	.88	1.0	4.2	12	68	8.9	5.6	7.2	7.6
25	1.1	725	1.0	.90	1.0	3.4	12	68	8.9	5.7	7.2	7.6
26	1.1	690	1.0	.93	1.0	3.9	12	68	8.9	5.7	7.2	7.6
27	1.0	283	1.0	1.0	1.1	4.0	12	68	9.0	5.7	7.2	7.6
28	1.0	79	1.0	.96	1.1	3.4	11	30	9.8	5.7	7.2	7.6
29	1.0	25	1.0	.93	---	3.7	11	12	9.8	5.8	7.2	7.6
30	1.0	25	1.0	1.0	---	4.1	11	11	9.5	6.1	7.2	7.6
31	1.0	---	1.0	1.0	---	4.1	---	11	---	6.1	7.2	---
TOTAL	1304.12	6152.4	400.0	30.60	27.09	394.8	1336.7	1409.8	1408.1	216.3	216.4	225.4
MEAN	42.1	205	12.9	.99	.97	12.7	44.6	45.5	46.9	6.98	6.98	7.51
MAX	165	1030	25	1.0	1.2	172	252	122	287	7.8	7.8	8.9
MIN	.90	1.0	1.0	.88	.80	1.1	4.1	9.8	8.9	4.8	6.1	7.2
AC-FT	2590	12200	793	61	54	783	2650	2800	2790	429	429	447

CAL YR 1985	TOTAL 48257.54	MEAN 132	MAX 1510	MIN .90	AC-FT 95720
WTR YR 1986	TOTAL 13121.60	MEAN 35.9	MAX 1030	MIN .80	AC-FT 26030

## ARKANSAS RIVER BASIN

07176500 BIRD CREEK NEAR AVANT, OK

LOCATION.--Lat 36°29'12", long 96°03'50", in NW 1/4 sec.7, T.23 N., R.12 E., Osage County, Hydrologic Unit 11070107, 150 ft upstream from county road bridge at Avant, 1.5 mi upstream from Candy Creek, and at mile 54.2.

DRAINAGE AREA.--364 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 651.28 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation since March 1977 by Birch Lake, located on Birch Creek, 12.1 mi upstream. Small diversions upstream for municipal water supply for the cities of Pawhuska and Barnsdall.

AVERAGE DISCHARGE.--41 years, 212 ft<sup>3</sup>/s, 153,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,400 ft<sup>3</sup>/s, Oct. 2, 1959, gage height, 31.40 ft; maximum gage height, 32.03 ft, Mar. 11, 1974; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft<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. 18	1800	8,960	12.02	May 17	1600	7,040	9.19
Nov. 13	2200	10,100	14.01	June 4	1400	9,080	12.23
Nov. 15	1200	10,300	14.39	Sept. 30	0700	*27,600	*30.54
Apr. 4	0600	7,230	9.46				

Minimum daily discharge, 10 ft<sup>3</sup>/s, Sept. 8-10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	214	55	129	41	18	21	40	64	82	44	18	12
2	106	53	122	41	19	21	413	69	79	37	18	13
3	65	38	102	41	20	21	2970	92	90	34	18	13
4	42	27	92	41	20	20	4690	67	4430	38	18	13
5	24	21	91	41	26	20	950	58	2160	41	20	12
6	19	21	91	41	31	20	584	54	3250	41	22	12
7	16	20	92	37	31	18	474	54	800	41	24	11
8	15	19	94	36	31	18	569	51	456	41	78	10
9	13	18	94	35	31	18	485	63	330	41	98	10
10	13	18	91	32	31	18	431	893	397	40	278	10
11	13	17	140	29	30	313	295	2690	521	38	36	13
12	14	3220	170	29	24	1880	134	513	489	37	19	13
13	19	4450	141	29	22	624	113	311	434	908	18	12
14	1620	6600	114	29	21	318	175	357	195	786	18	12
15	583	7530	103	29	22	141	289	445	185	163	17	16
16	509	1600	95	30	27	101	155	452	183	80	16	1100
17	405	594	81	31	31	78	121	4060	174	56	16	327
18	4780	2080	81	31	31	81	128	1390	86	45	16	113
19	2470	2930	78	31	31	101	136	499	69	34	15	49
20	933	1570	70	32	31	84	134	442	64	31	15	24
21	567	1690	65	36	29	64	112	361	64	29	14	19
22	489	1480	64	37	25	57	82	310	53	29	13	17
23	406	1360	62	28	24	54	71	282	880	29	13	16
24	127	1270	62	20	24	49	66	192	189	29	13	15
25	84	1060	62	19	21	41	63	204	98	29	13	13
26	68	847	60	18	21	35	61	189	68	25	13	15
27	59	606	53	18	21	31	62	179	64	21	16	16
28	48	144	44	18	21	31	74	242	68	20	14	15
29	41	121	42	18	---	31	70	172	54	20	13	5160
30	41	111	41	18	---	29	62	116	48	20	12	24700
31	46	---	41	18	---	28	---	89	---	20	12	---
TOTAL	13849	39570	2667	934	714	4366	14009	14960	16060	2847	924	31781
MEAN	447	1319	86.0	30.1	25.5	141	467	483	535	91.8	29.8	1059
MAX	4780	7530	170	41	31	1880	4690	4060	4430	908	278	24700
MIN	13	17	41	18	18	18	40	51	48	20	12	10
AC-FT	27470	78490	5290	1850	1420	8660	27790	29670	31860	5650	1830	63040

CAL YR 1985 TOTAL 269692 MEAN 739 MAX 17500 MIN 4.1 AC-FT 534900  
WTR YR 1986 TOTAL 142681 MEAN 391 MAX 24700 MIN 10 AC-FT 283000



## 07177400 SKIATOOK LAKE NEAR SKIATOOK, OK

LOCATION.--Lat 36°21'02", long 96°05'13", in NE 1/4 SE 1/4 sec.26, T.22 N., R.11 E., Osage County, Hydrologic Unit 11070107, at right end of dam, 5.0 mi west of Skiatook and at mile 14.3.

DRAINAGE AREA.--354 mi<sup>2</sup>.

PERIOD OF RECORD.--October 31, 1984 to current year.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by rolled earthfill dam. Spillway is a concrete uncontrolled structure in right abutment. Outlet works consists of a controlled intake structure with a 10-foot, 6-inch diameter tunnel, a 2-foot, 6-inch by 5-foot low-flow sluice and a 36-inch water-supply pipe. Regulated storage began Oct. 31, 1984. Capacity, 893,000 acre-ft, at elevation 750.8 ft, maximum pool; 513,500 acre-ft at elevation 729.0 ft, top of flood control pool; 331,200 acre-ft, at elevation 714.0 ft, top of conservation pool; 11,800 acre-ft, at elevation 657.0 ft, top of inactive pool. Figures given herein represent total contents. Reservoir is designed for flood control, water supply, water quality, recreation and conservation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 201,400 acre-ft, Sept. 30, 1986, elevation 699.80 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 201,400 acre-ft, Sept. 30, elevation 699.80 ft; minimum, 10,660 acre-ft, Oct. 1, elevation 656.23 ft.

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

656	103,500	680	79,350
662	206,700	690	133,100
670	412,300	701	210,900

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10810	34510	76620	80080	81010	81840	92180	106700	124300	135300	132600	131500
2	10920	34480	79440	80220	81100	81980	92180	106900	124400	135400	132800	131600
3	10950	34480	79620	80220	81100	81890	96440	106800	124400	135600	132700	131600
4	10970	34510	79810	80360	81150	81890	102400	106800	124400	136100	132400	131600
5	10950	34540	79990	80220	81150	81700	103200	106700	133400	136400	132300	131600
6	10940	34620	80130	80220	81150	81700	104200	106800	136900	136600	132300	131600
7	10950	34560	80360	80130	81150	81700	104700	106800	138600	136800	132300	131300
8	10950	34560	80360	80130	81150	81750	104700	107000	139100	137000	132400	131100
9	10950	34620	80640	80220	81150	81750	104700	107000	139300	137100	132400	131000
10	10940	34510	80870	80360	81190	82210	104900	108400	138200	137100	132400	131100
11	10940	34450	80960	80450	81190	81940	105000	109200	137200	137000	132400	131100
12	11010	40160	81290	80540	81190	81660	105000	109500	136400	137000	132400	130900
13	11040	49360	81290	80450	81190	90000	105600	109500	135700	137000	132400	130800
14	18530	69360	81150	80500	81130	90540	105400	110300	134800	136900	132100	130800
15	19770	82690	81150	80590	81470	90790	105400	111800	134400	136200	132100	130700
16	19990	85720	81150	80780	81660	91090	105400	112400	134000	136000	132200	132600
17	20120	86580	81050	80780	81660	90330	105600	120900	133900	135300	132300	134000
18	29790	91230	80640	80870	81840	91730	106000	122000	133500	134800	132200	134100
19	33270	93940	80410	80820	81800	91730	106100	122300	133300	134700	132100	134300
20	33660	93990	80310	81050	81800	91680	106400	122500	133700	134400	132100	134300
21	33850	90940	80180	81010	81560	91580	106300	122400	133900	134100	132200	134300
22	34070	87500	80220	80730	81160	91580	106200	122600	134100	134100	132400	134200
23	34180	83910	80130	80680	81890	91830	106400	122700	134000	134100	132300	134200
24	34230	80360	79780	80780	81750	92030	106500	122700	134000	134100	132300	134200
25	34230	78710	79620	80870	82030	91980	106500	123600	134100	133900	132100	134000
26	34230	79260	79780	80910	82220	92180	106500	123700	134400	134000	132100	134300
27	34260	79720	79780	80540	81750	92130	106800	123800	134500	134000	132300	134400
28	34260	79720	79810	80730	81750	92180	106500	124000	134600	133900	132100	134400
29	34370	79720	79850	80730	---	92230	106600	124100	134600	133900	131800	153000
30	34400	79670	80080	80680	---	92130	106600	124100	135100	133500	131600	201400
31	34450	---	80080	81010	---	92130	---	124300	---	133400	131600	---
MAX	34450	93990	81290	81050	82220	92230	106800	124300	139300	137100	132800	201400
MIN	10810	34450	76620	80080	81010	81660	92180	106700	124300	133400	131600	130700
(†)	667.68	680.07	680.16	680.36	680.52	682.67	685.44	688.56	690.33	690.05	689.76	700.80
(††)	+23,780	+45,220	+410	+930	+740	+10,380	+14,470	+17,700	+10,800	-1,700	-1,800	+69,800
CAL YR 1985	MAX	93990	MIN	7000	(††)	+50,360						
WTR YR 1986	MAX	201400	MIN	10810	(††)	+190,730						

(†) ELEVATION, IN FEET, AT END OF MONTH  
(††) CHANGE IN CONTENTS, IN ACRE-Feet

## ARKANSAS RIVER BASIN

07177410 HOMINY CREEK NEAR SKIATOOK, OK

LOCATION.--Lat 36°21'01", long 96°04'56", in SW 1/4 SW 1/4 sec.25, T.22 N., R.11 E., Osage County, Hydrologic Unit 11070107, located 300 ft downstream from Skiatook Lake stilling basin on the left bank of outlet channel, approximately 5.0 mi west of Skiatook, and at mile 14.0 on Hominy Creek.

DRAINAGE AREA.--354 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1984 to current year.

GAGE.--Water-stage recorder. Datum of gage is at 610.00 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Water year 1985: Oct. 26-29, Dec. 13-16, Dec. 25 to Jan. 6, 12-15, 18-21, Feb. 21-23, Mar. 25. to Apr. 7, 13-14, Apr. 29 to May 1, June 3-6, 8-19, July 4-31, and Aug. 13 to Sept. 30. Records poor. Flow regulated by Skiatook Lake (station 07177400).

Water year 1986: Oct. 1, Oct. 3 to Nov. 19, Nov. 26 to Jan. 22, Mar. 11-12, Apr. 3 to May 19, May 21 to June 8, 17, 19, and Sept. 29-30. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by Skiatook Lake (07177400).

COOPERATION.--Water year 1985: Gage-height record and discharge measurements furnished by the U.S. Army Corps of Engineers; records computed by the U.S. Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,880 ft<sup>3</sup>/s, May 9, 1985, gage height 21.52 ft; maximum gage height, 25.44 ft, Apr. 30, 1985 (from backwater); minimum daily discharge, 0.03 ft<sup>3</sup>/s, Nov. 10-14, 1984, and Feb. 22-24, 1986.

EXTREMES FOR CURRENT PERIOD.--Water year 1985: Maximum discharge, 3,880 ft<sup>3</sup>/s, May 9, gage height 21.52 ft; maximum gage height, 25.44 ft, Apr. 30 (from backwater); minimum daily discharge, 0.03 ft<sup>3</sup>/s, Nov. 10-14. water year 1986: Maximum discharge, 3,080 ft<sup>3</sup>/s, Nov. 21, gage height, 19.44 ft; maximum gage height, 20.49 ft, Sept. 29 (from backwater); minimum daily discharge, 0.03 ft<sup>3</sup>/s, Feb. 22-24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.98	.76	.05	500	.82	2700	15	.60	31	2230	.16	.25
2	.73	.40	.05	800	.78	2670	2200	.34	31	1980	.16	.28
3	.78	.32	.05	1300	.97	2450	2150	1180	32	995	.22	.25
4	.63	.25	.06	2120	.82	383	2100	2280	35	175	.16	.26
5	1.1	.22	.11	2100	.78	203	1200	2250	33	93	.43	.25
6	.80	.14	.11	2100	205	1510	700	2530	31	28	.32	.28
7	.86	.05	.18	2180	363	2950	690	2840	709	27	.33	.49
8	1.0	.03	.26	2140	356	3150	475	2800	1450	26	.28	.40
9	.94	.03	.36	1430	346	3120	107	3390	1400	26	.25	.60
10	1.2	.03	.19	646	340	3080	109	3170	540	25	.29	.77
11	.70	.03	.11	367	334	3050	107	2580	10	3.7	.22	.25
12	.56	.03	.06	725	329	2990	109	2520	8.0	.10	.24	.24
13	.98	.03	.35	740	122	2940	105	2200	215	.09	.22	1.0
14	1.8	.03	1.8	950	.28	2900	104	2080	1130	.08	.50	.60
15	1.0	.05	1.1	1300	.25	2860	109	2390	1080	.07	.45	.35
16	.72	.05	1.0	682	.31	2800	112	2330	9.0	.08	.38	.25
17	.25	.43	260	375	.25	2750	362	1480	8.6	.10	.32	.22
18	.24	1.3	1200	170	.22	2780	555	790	900	.19	.29	.23
19	.24	.55	1290	87	.25	2690	254	780	2300	.25	.40	.21
20	1.4	.41	1060	40	.31	2410	69	771	2570	.10	.37	.22
21	.64	.39	648	38	400	2040	72	259	2560	.33	.30	.21
22	.53	.39	399	9.0	390	1900	73	.52	1180	1.2	.28	.38
23	.60	.39	389	1.6	120	1820	73	.34	5.8	.19	.26	1.1
24	.53	.35	95	1.3	27	1770	73	.26	785	.30	.27	.52
25	27	.24	8.0	1.2	.87	180	262	.23	2260	.29	.25	1.1
26	45	.14	.56	1.0	409	11	228	.20	2490	.45	.30	.90
27	70	.14	.39	.98	1350	.70	215	1.0	2460	.38	.28	.48
28	120	.14	.44	.93	2340	.45	238	.94	2410	.30	.27	.38
29	80	.06	.40	.93	---	.33	220	448	2350	.23	.26	1.0
30	50	.05	.50	.87	---	.29	1.0	460	2290	.20	.27	.60
31	8.2	---	740	.83	---	.27	---	140	---	.17	.26	---
TOTAL	419.41	7.43	6097.13	20808.62	7437.91	58109.02	13087.0	39672.41	31313.4	5613.79	8.99	14.07
MEAN	13.5	.25	197	671	266	1874	436	1280	1044	181	.29	.47
MAX	120	1.3	1290	2180	2340	3150	2200	3390	2570	2230	.50	1.1
MIN	.24	.03	.05	.83	.22	.27	1.0	.20	5.8	.07	.16	.21
AC-FT	832	15	12090	41270	14750	115300	25960	78690	62110	11130	18	28

WTR YR 1985 TOTAL 182588.06 MEAN 500 MAX 3390 MIN .03 AC-FT 362200

## ARKANSAS RIVER BASIN

85

07177410 HOMINY CREEK NEAR SKIATOOK, OK--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.40	.53	1.3	.34	.25	.19	.75	.40	.26	.97	.93	1.2
2	.35	.50	1.2	.35	.14	.21	.78	.38	.35	1.0	.93	1.6
3	.33	.52	1.1	.33	.14	.21	1.3	.35	.33	1.0	.93	1.2
4	.32	.52	1.0	.33	.16	.22	1.9	.34	.90	1.0	.93	1.2
5	.33	.49	.97	.32	.16	.22	1.7	.30	.88	1.0	1.0	1.2
6	.32	.51	.98	.29	.16	.22	2.0	.28	.85	1.0	.93	1.2
7	.31	.50	.94	.25	.16	.22	1.7	.25	.83	1.0	1.0	1.2
8	.35	.52	.92	.22	.14	.21	1.5	.18	.82	1.0	1.1	1.2
9	.34	.48	1.1	.20	.08	.26	1.4	.50	250	1.0	1.1	1.2
10	.38	.47	1.0	.20	.08	.29	1.3	1.6	512	.93	1.1	1.2
11	.40	.45	1.5	.19	.08	.25	1.6	1.3	513	.93	1.1	1.4
12	.39	.48	1.2	.18	.08	.21	1.1	.98	513	.95	1.1	1.4
13	.38	1.4	.48	.17	.06	.18	.95	.84	359	1.4	1.1	1.4
14	1.1	1.7	.99	.16	.06	.16	1.7	1.0	257	115	1.1	1.4
15	.90	1.6	.98	.15	.06	.16	1.2	1.6	257	263	1.1	1.5
16	.70	1.3	.97	.14	.06	.16	1.0	.94	146	263	1.1	2.0
17	.64	1.2	.96	.14	.06	.16	1.2	1.5	45	263	1.1	1.7
18	.90	1.3	.95	.13	.06	.20	1.4	1.1	43	127	1.1	1.6
19	.86	2.5	.94	.12	.06	.22	1.0	.70	10	48	1.1	1.6
20	.80	647	.94	.13	.06	.22	1.2	.30	.82	48	1.1	1.7
21	.68	2050	.93	.12	.03	.22	.80	.24	.87	19	1.1	1.8
22	.48	2250	.93	.12	.03	.24	.60	.22	.89	.93	1.1	1.8
23	.41	2190	.92	.11	.03	.29	.50	.21	1.0	.93	1.1	1.8
24	.39	2140	.5.0	.11	.03	.31	.40	.20	1.0	.93	1.1	1.8
25	.38	2020	1.0	.11	.08	.31	.30	.58	.99	.93	1.3	1.8
26	.39	.50	.60	.11	.15	.32	.25	.39	.82	.93	1.3	2.1
27	.37	1.1	.50	.11	.16	.36	.23	.51	.86	.93	1.4	1.8
28	.38	.90	.41	.11	.15	.39	.60	.48	.88	.93	1.1	1.9
29	.70	1.0	.39	.14	---	.46	.45	.47	.87	.93	1.1	3.0
30	.68	.96	.37	.22	---	.56	.30	.36	.87	.93	1.2	6.0
31	.54	---	.35	.25	---	.53	---	.30	---	.93	1.2	---
TOTAL	15.90	11367.93	1020.83	5.85	2.77	8.16	31.11	18.80	2920.09	1168.48	33.95	51.9
MEAN	.51	.379	.32.9	.19	.10	.26	1.04	.61	97.3	37.7	1.10	1.73
MAX	1.1	2250	.99	.35	.25	.56	2.0	1.6	513	263	1.4	6.0
MIN	.31	.45	.35	.11	.03	.16	.23	.18	.26	.93	.93	1.2
AC-FT	32	22550	2020	12	5.5	16	62	37	5790	2320	67	103
CAL YR 1985	TOTAL	188467.84	MEAN	516	MAX	3390	MIN	.07	AC-FT	373800		
WTR YR 1986	TOTAL	16645.48	MEAN	45.6	MAX	2250	MIN	.03	AC-FT	33020		

## ARKANSAS RIVER BASIN

07177500 BIRD CREEK NEAR SPERRY, OK

LOCATION.--Lat 36°16'42", long 95°57'14", in NW 1/4 NW 1/4 sec.29, T.21 N., R.13 E., Tulsa County, Hydrologic Unit 11070107, on downstream side of right pier of county road bridge, 1.5 mi upstream from Delaware Creek, 2.4 mi downstream from Hominy Creek, 2.5 mi southeast of Sperry, and at mile 25.0.

DRAINAGE AREA.--905 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area. WSP 1921: 1943.

GAGE.--Water-stage recorder. Datum of gage is 579.43 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated to some extent since 1985 by Skiatook Lake, and by Birch Lake since 1977 (combined capacity, about 950,000 acre-ft).

AVERAGE DISCHARGE.--48 years, 507 ft<sup>3</sup>/s, 367,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 90,000 ft<sup>3</sup>/s Oct. 3, 1959, gage height, 32.60 ft, from rating curve extended above 49,000 ft<sup>3</sup>/s; no flow at times in 1939, 1954-57, 1964-66, 1970.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 18, 1943, reached a stage of 31.68 ft, discharge 72,200 ft<sup>3</sup>/s. Flood in 1915 reached a stage similar to flood of Oct. 31, 1941, 30.14 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 11,000 ft<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)
Sept. 30	2400	*19,800	*29.42	Stage rising, peak occurred Oct. 1, 1986. No peaks greater than base discharge.			

Minimum daily discharge, 9.4 ft<sup>3</sup>/s, Sept. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	327	67	371	75	29	31	51	111	116	58	29	14
2	181	67	267	75	30	31	64	94	106	58	26	15
3	107	62	195	75	31	30	1460	93	1570	50	26	16
4	70	52	164	73	32	28	5130	109	1950	46	26	16
5	53	45	153	69	33	26	3160	88	4970	46	29	16
6	41	40	152	69	38	26	1050	77	3730	43	30	15
7	33	38	152	65	44	26	846	73	1960	42	32	13
8	28	35	152	62	46	25	703	70	759	41	87	13
9	24	33	152	59	46	24	661	69	507	41	269	12
10	22	29	188	58	46	25	571	127	941	41	430	11
11	21	28	886	56	46	78	472	2060	1050	40	192	11
12	21	406	400	56	45	3390	317	1430	1100	38	68	9.4
13	26	5030	292	54	42	1690	184	432	1010	398	42	12
14	1850	8210	322	53	41	723	251	356	669	1600	33	14
15	1980	9280	318	52	41	368	350	763	520	666	30	20
16	573	6900	305	52	44	206	308	650	468	439	30	130
17	446	1930	297	52	47	161	205	3710	246	368	26	1990
18	1550	1610	275	52	47	134	202	4210	216	305	24	360
19	4690	5860	268	52	47	127	201	1080	144	106	22	136
20	1720	3910	256	52	45	137	211	566	98	92	21	74
21	706	3310	246	52	43	112	197	481	84	85	21	50
22	486	3630	238	51	40	93	154	392	79	54	19	38
23	434	3500	238	51	39	85	119	339	793	43	16	31
24	305	3410	231	48	38	77	108	285	366	43	15	26
25	128	3130	124	38	37	71	98	670	191	41	15	23
26	94	1140	94	34	36	64	90	347	112	40	14	211
27	79	916	96	31	32	61	88	241	84	38	15	222
28	69	445	84	31	31	57	87	230	102	35	17	52
29	85	208	78	30	---	54	96	264	90	33	17	980
30	97	186	75	30	---	52	96	187	66	31	17	12900
31	73	---	75	29	---	50	---	141	---	30	15	---
TOTAL	16319	63507	7144	1636	1116	8062	17530	19745	24097	4991	1653	17430.4
MEAN	526	2117	230	52.8	39.9	260	584	637	803	161	53.3	581
MAX	4690	9280	886	75	47	3390	5130	4210	4970	1600	430	12900
MIN	21	28	75	29	29	24	51	69	66	30	14	9.4
AC-FT	32370	126000	14170	3250	2210	15990	34770	39160	47800	9900	3280	34570
CAL YR 1985	TOTAL	613329.9		MEAN	1680	MAX	24000	MIN	5.2	AC-FT	1217000	
WTR YR 1986	TOTAL	183230.4		MEAN	502	MAX	12900	MIN	9.4	AC-FT	363400	

## ARKANSAS RIVER BASIN

87

07178050 BIRD CREEK NEAR CATOOSA, OK

LOCATION.--Lat 36°14'21", long 95°50'52", in NW 1/4 SW 1/4 sec.5, T.20 N., R.14 E., Tulsa County, Hydrologic Unit 11070107, at bridge on U.S. Highway 75, approximately 5.5 mi northwest of Catoosa.

DRAINAGE AREA.--1,080 mi<sup>2</sup>.

PERIOD OF RECORD.--Water years 1965 to current year.

REMARKS.--Samples were collected on a monthly basis and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	METRIC PRES- SURE (MM OF HG)
OCT 28...	1645	1028	80020	480	6.80	19.5	20.5	24	746
NOV 26...	1345	1028	80020	*297	6.60	9.0	13.0	76	742
DEC 10...	1135	1028	80020	670	7.10	--	8.0	22	747
JAN 21...	1230	1028	80020	810	7.70	--	10.5	6.0	742
FEB 27...	0830	1028	80020	*913	7.00	16.0	13.0	7.5	750
APR 29...	1115	1028	80020	714	7.70	23.5	20.0	16	742
JUN 06...	1015	1028	80020	244	7.50	25.0	23.0	230	741
19...	1045	1028	80020	450	7.50	32.0	26.5	30	746
JUL 18...	1330	1028	80020	418	7.60	36.0	29.5	55	748
SEP 10...	1145	1028	80020	620	7.20	29.5	24.5	8.8	741
22...	1400	1028	80020	420	7.50	30.5	27.5	46	746

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
OCT 28...	8.9	101	140	9	43	8.0	33	33	1
NOV 26...	--	--	92	28	27	6.0	18	29	0.8
DEC 10...	10.2	88	210	48	64	12	41	29	1
JAN 21...	10.0	92	230	67	68	15	65	37	2
FEB 27...	10.8	104	260	75	78	17	80	39	2
APR 29...	7.1	80	190	42	57	12	53	37	2
JUN 06...	8.2	99	79	7	24	4.6	12	24	0.6
19...	7.5	96	140	31	41	8.7	34	34	1
JUL 18...	6.2	83	110	26	32	7.2	30	36	1
SEP 10...	6.2	77	140	36	42	9.0	58	45	2
22...	6.9	90	110	29	34	6.5	38	41	2

\* SPECIFIC CONDUCTANCE, LAB (US/CM)



## ARKANSAS RIVER BASIN

07178050 BIRD CREEK NEAR CATOOSA, OK

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
OCT								
28...	5.3	138	0	131	35	40	43	261
NOV								
26...	3.1	78	0	64	31	26	26	159
DEC								
10...	3.9	196	0	161	25	61	59	362
JAN								
21...	5.2	201	0	165	6.4	72	96	438
FEB								
27...	5.3	232	0	190	37	80	130	517
APR								
29...	4.5	183	0	150	5.8	69	78	388
JUN								
06...	4.0	117	0	72	5.9	23	11	135
19...	4.1	130	0	107	6.5	39	42	261
JUL								
18...	4.4	102	0	84	4.1	24	49	223
SEP								
10...	9.6	129	0	106	13	52	71	372
22...	6.2	101	0	83	5.1	37	40	280

## ARKANSAS RIVER BASIN

89

07178620 VERDIGRIS RIVER NEAR INOLA, OK  
(National stream-quality accounting network station)

LOCATION.--Lat 36°09'43", long 95°37'07", in NW 1/4 NW 1/4 sec.4, T.9 N., R.16 E., Rogers County, Hydrologic Unit 11070105, at bridge on State Highway 33, 6.0 mi west of Inola, and at navigation channel mile 36.6.

DRAINAGE AREA.--7,911 mi<sup>2</sup>.

PERIOD OF RECORD.--Water years 1972 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1971 to September 1976.

WATER TEMPERATURE: December 1971 to September 1976.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	
DEC 12...	1240	1028	80020	300	6.80	-0.5	4.5	65	747	11.8	93	59	
FEB 25...	1400	1028	80020	540	8.00	20.5	13.5	10	747	10.3	101	--	
MAY 01...	1300	1028	80020	*485	7.54	21.5	18.5	28	752	9.5	103	--	
JUN 25...	1230	1028	80020	345	7.30	37.0	28.0	42	746	7.2	94	110	
AUG 06...	1130	1028	80020	310	7.90	28.0	29.0	46	740	7.1	95	42	
DATE		STREP-TOCOCCEI FECAL, KF AGAR (COLS./PER 100 ML)	HARD-NESS (MG/L AS CAC03)	NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE IT-FLD (MG/L AS HCO3)	CAR-BONATE IT-FLD (MG/L AS CO3)	ALKA-LITY, CARBON-ATE IT-FLD (MG/L AS CAC03)
DEC 12...	44	110	35	34	6.8	11	17	0.5	3.2	95	0	76	
FEB 25...	--	190	51	58	11	29	25	1	2.8	170	0	139	
MAY 01...	--	200	46	61	11	21	19	0.7	2.6	185	0	152	
JUN 25...	45	140	9	43	7.1	16	20	0.6	2.8	156	0	129	
AUG 06...	270	110	16	35	5.8	16	23	0.7	3.0	116	0	95	
DATE		CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)
DEC 12...	24	21	15	0.20	8.9	155	150	0.21	0.0	0.370	1.6	0.020	
FEB 25...	2.7	59	52	0.20	6.8	311	300	0.42	0.0	0.580	--	0.020	
MAY 01...	8.5	58	27	0.20	3.4	282	280	0.38	0.0	0.310	--	0.070	
JUN 25...	12	23	22	0.20	7.8	205	200	0.28	0.0	0.300	--	0.010	
AUG 06...	2.3	20	32	0.30	4.8	181	170	0.25	0.0	--	--	<0.050	

\* SPECIFIC CONDUCTANCE, LAB (US/CM)

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[illegible][illegible]

LOCATION.--Lat 36°55'43", long 94°57'26", in SW 1/4 SE 1/4 sec.5, T.28 N., R.22 E., Ottawa County, Hydrologic Unit 11070206, on downstream side of right pier of county road bridge, 1.3 mi upstream from Mud Creek, 2.2 mi downstream from Four Mile Creek, 4.5 mi west of Commerce, and at mile 153.4.

DRAINAGE AREA.--5,876 mi<sup>2</sup>.

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

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 748.97 ft, U.S. Army Corps of Engineers datum.

REMARKS.--Estimated daily discharges: Dec. 13, 14. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated to some extent since 1963 by John Redmond Reservoir in Kansas, 190 mi upstream.

AVERAGE DISCHARGE.--47 years, 3,600 ft<sup>3</sup>/s, 2,608,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 267,000 ft<sup>3</sup>/s, July 15, 1951, computed by flood-routing methods from hydrograph defined at Miami, mile 144.2, by several discharge measurements, gage-height record, and by comparison with computed inflow into Lake O' The Cherokees; maximum gage height, 34.03 ft, July 16, 1951, from floodmark; no flow at times in 1953-54, and 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 20,000 ft<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. 20	0900	22,900	15.68	Apr. 5	0600	20,100	14.29
Nov. 19	1900	*48,400	*20.81	Apr. 9	1200	20,800	14.66
Dec. 12	0200	21,900	15.20	May 19	0200	26,100	17.17

Minimum daily discharge, 196 ft<sup>3</sup>/s, July 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18500	13400	12800	2900	962	1550	782	1610	1040	253	500	1280
2	15400	12600	11400	2750	963	1510	781	2250	1280	196	594	1280
3	7470	12200	8690	2170	1560	1430	2140	2650	2150	4230	745	1260
4	8910	11900	7710	1940	10800	1250	11700	1820	2470	5960	825	1240
5	11000	11700	7390	1720	14800	1190	19500	1310	1870	5670	1020	1110
6	10700	11500	6940	1500	6570	1160	13600	1170	2130	3680	925	813
7	8620	11800	5230	1420	4670	1090	5210	1100	3260	3420	684	720
8	7670	11900	3890	1360	6270	922	11700	1070	2570	3550	662	635
9	7170	11600	4510	1270	7300	852	20000	1030	2070	3310	650	434
10	5620	11100	6970	1220	7760	776	15600	1040	1910	4530	669	322
11	4160	10700	19600	1200	7400	706	7710	1550	6950	7600	3230	509
12	11000	13500	20200	1040	6120	2230	6070	1630	3880	9340	4230	1900
13	14100	26800	11600	818	2810	3510	7910	1870	2050	11100	3420	1180
14	17400	35800	6720	785	1390	2690	8710	1590	1490	9810	2970	500
15	15600	39000	5410	768	1020	1580	8710	5020	1160	7410	1870	272
16	11400	40400	4700	772	999	1190	7610	6960	931	7190	1150	1690
17	11000	40200	4050	797	2740	1180	6040	14100	658	7500	1500	8300
18	15200	39100	4030	802	4420	1150	3320	24800	707	5360	1670	5970
19	21500	43600	4010	809	4000	1110	2180	24900	620	2420	989	3850
20	22600	46900	3740	823	3510	1100	1840	18100	557	1210	763	3180
21	19200	40500	3500	854	3160	1140	1630	4660	533	894	665	3130
22	10300	20400	3210	893	2860	1320	1430	4800	489	1090	615	2200
23	10800	8560	2840	894	2160	1390	1340	8470	545	1090	587	1580
24	11800	7490	3340	1170	1820	1340	1280	10200	1630	1070	709	1460
25	12200	6820	4500	1660	1760	1300	1230	10500	1010	1060	1040	1410
26	12100	6210	4120	1710	1690	1280	1190	6940	708	1050	1060	1490
27	12000	6250	3670	1410	1660	1260	1190	4920	546	1020	1100	4550
28	11900	7400	3450	1170	1610	1110	1290	4530	545	889	919	2200
29	13500	8240	3120	1060	---	861	1280	3980	447	628	682	4940
30	18500	8180	3040	991	---	796	1430	2100	332	544	826	34400
31	16100	---	2970	962	---	774	---	1210	---	516	985	---
TOTAL	393420	575750	197350	39638	112784	40747	174403	177880	46538	113590	38254	93805
MEAN	12690	19190	6366	1279	4028	1314	5813	5738	1551	3664	1234	3127
MAX	22600	46900	20200	2900	14800	3510	20000	24900	6950	11100	4230	34400
MIN	4160	6210	2840	768	962	706	781	1030	332	196	500	272
AC-FT	780300	1142000	391400	78620	223700	80820	345900	352800	92310	225300	75880	186100
CAL YR 1985	TOTAL	3375919		MEAN	9249	MAX	70800	MIN	226	AC-FT	6696000	
WTR YR 1986	TOTAL	2004159		MEAN	5491	MAX	46900	MIN	196	AC-FT	3975000	

LOCATION.--Lat 36°54'00", long 94°52'05", in NW 1/4 NE 1/4 sec.19, T.28 N., R.23 E., Ottawa County, Hydrologic Unit 11070206, near downstream left abutment of 22nd Street bridge in Miami, 0.5 mi east of intersection of Main and 22nd Street.

PERIOD OF RECORD.--January 11, 1984 to current year.

GAGE.--Water-stage recorder. Datum of gage is 762.23 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Apr. 9 to May 6. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,310 ft<sup>3</sup>/s, Sept. 30, 1986, gage height, 13.73 ft; minimum daily discharge, 0.07 ft<sup>3</sup>/s, Aug. 15, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,310 ft<sup>3</sup>/s, Sept. 30, gage height, 13.73 ft; minimum daily discharge, 0.46 ft<sup>3</sup>/s, July 21.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	45	397	13	6.0	10	11	17	4.1	6.4	2.3	3.8
2	12	29	110	13	5.8	10	12	14	4.6	12	12	3.8
3	10	23	48	12	169	9.4	21	13	9.1	5.3	4.5	5.2
4	8.2	19	37	12	150	9.2	509	12	25	3.6	2.6	5.8
5	6.9	18	34	11	60	8.3	145	10	31	2.6	2.3	6.4
6	6.2	17	30	11	130	8.2	60	9.5	41	2.0	21	6.2
7	5.6	15	28	9.9	136	7.8	118	9.0	30	1.8	7.0	5.6
8	5.5	14	26	8.3	67	7.3	1450	8.7	26	1.5	3.9	5.4
9	5.4	14	25	7.8	45	7.6	150	8.3	22	1.2	4.3	5.9
10	5.5	13	126	8.0	33	8.9	70	8.1	12	1.2	15	6.4
11	9.3	12	754	8.5	23	27	35	15	129	1.4	4.7	6.2
12	18	768	169	8.7	19	316	33	8.3	62	2.3	2.7	6.7
13	19	2570	67	8.3	17	91	30	6.9	28	9.8	2.3	7.1
14	220	2900	40	8.3	18	43	110	6.4	17	5.8	2.1	7.3
15	155	935	32	8.2	19	28	50	13	11	2.7	1.9	17
16	56	309	32	8.5	42	22	35	11	8.6	2.0	2.3	58
17	32	121	33	8.7	60	19	32	48	6.9	1.2	2.6	43
18	648	1170	30	8.9	36	19	31	37	5.8	.92	2.7	27
19	628	1270	26	8.9	25	17	29	21	5.2	.70	2.5	18
20	118	405	22	8.2	20	14	26	15	4.6	.65	2.3	15
21	60	114	20	7.9	16	13	24	12	3.8	.46	2.3	12
22	41	73	23	6.9	15	12	22	11	3.2	.51	2.1	12
23	30	56	25	6.3	15	12	20	9.7	2.7	.67	2.2	12
24	24	45	24	6.5	14	12	17	8.7	2.8	.67	2.5	12
25	20	42	18	6.1	12	11	16	7.8	2.8	.56	2.7	11
26	18	47	16	5.9	12	11	15	7.0	2.7	.49	2.9	380
27	16	42	15	5.0	12	11	24	6.5	18	.79	4.4	362
28	15	34	14	5.4	11	11	30	6.9	99	.59	4.9	83
29	186	30	14	5.7	---	11	26	6.0	18	.69	4.7	343
30	293	33	14	5.3	---	10	21	5.2	8.9	1.3	4.0	3340
31	87	---	14	5.6	---	10	---	4.7	---	1.8	3.9	---
TOTAL	2774.6	11183	2263	257.8	1187.8	806.7	3172	376.7	644.8	73.60	137.6	4826.8
MEAN	89.5	373	73.0	8.32	42.4	26.0	106	12.2	21.5	2.37	4.44	161
MAX	648	2900	754	13	169	316	1450	48	129	12	21	3340
MIN	5.4	12	14	5.0	5.8	7.3	11	4.7	2.7	.46	1.9	3.8
AC-FT	5500	22180	4490	511	2360	1600	6290	747	1280	146	273	9570
CAL YR 1985	TOTAL 37724.58			MEAN 103	MAX 3580	MIN .40	AC-FT 74830					
WTR YR 1986	TOTAL 27704.17			MEAN 75.9	MAX 3340	MIN .46	AC-FT 54950					



## ARKANSAS RIVER BASIN

93

## 07188000 SPRING RIVER NEAR QUAPAW, OK

LOCATION.--Lat 36°56'04", long 94°44'45", in NE 1/4 SW 1/4 sec.5, T.28 N., R.24 E., Ottawa County, Hydrologic Unit 11070207, near center of span on downstream side of pier of county road bridge, 0.1 mi upstream from Rock Creek, 3.0 mi southeast of Quapaw, and at mile 13.9. Records include flow of Rock Creek.

DRAINAGE AREA.--2,510 mi<sup>2</sup>, includes that of Rock Creek.

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

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 746.25 ft, National Geodetic Vertical Datum of 1929. Nonrecording gage on right bank at same datum used May 20 to Nov. 16, 1943.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Occasional releases from floodgates at old Riverton Hydroelectric plant, 15 mi upstream.

AVERAGE DISCHARGE.--47 years, 2,013 ft<sup>3</sup>/s, 10.89 in/yr, 1,458,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 190,000 ft<sup>3</sup>/s, May 19, 1943, gage height, 43.4 ft, from floodmark, from rating curve extended above 54,000 ft<sup>3</sup>/s, on basis of slope-area measurement of peak flow; minimum daily discharge, 5.8 ft<sup>3</sup>/s, July 8, 1954.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 67,000 ft<sup>3</sup>/s, Sept. 30, stage rising, peak occurred on Oct. 2, 1986; Peak discharges greater than base discharge 18,000 ft<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)
Nov. 15	2100	54,700	25.73	Dec. 11	1400	26,400	18.49
Nov. 20	0700	*57,200	*26.24	Apr. 8	0700	25,700	18.30
Dec. 2	0700	25,600	18.24				

Minimum daily discharge, 170 ft<sup>3</sup>/s, Sept. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	488	1950	17400	2370	1460	1830	1440	4010	668	856	212	227
2	700	1470	22500	2320	1460	1780	1490	3940	678	613	287	220
3	613	1330	12500	2270	1990	1750	1690	1820	799	601	292	217
4	564	1100	7610	2230	5830	1700	7860	1440	1120	338	286	211
5	409	785	5240	2180	5040	1660	11500	1380	1240	498	246	205
6	404	908	4630	2140	4020	1630	5790	1320	3520	481	251	199
7	400	887	4270	2080	5410	1600	3780	1260	3820	486	347	190
8	318	846	3930	2040	4550	1550	22100	1200	2160	514	324	181
9	319	810	3740	2000	3410	1530	13400	1140	1500	478	275	177
10	323	762	6480	1830	2710	1520	7880	1090	1830	453	350	170
11	345	738	24000	1870	2390	1570	5060	1050	4950	264	328	209
12	421	4100	21400	1900	2310	5050	3870	1030	2260	326	330	2060
13	584	24500	12700	1880	2200	6090	3140	991	1370	392	312	2300
14	1410	46200	7630	1860	2150	3710	3270	956	1090	386	303	985
15	1940	53800	4570	1840	2140	2600	2870	1140	1010	384	288	1170
16	1500	47900	4290	1820	2460	2410	2510	1200	883	414	193	3640
17	1030	29800	4010	1810	5000	2230	2350	2230	801	384	183	4940
18	5760	24500	3770	1790	4410	1980	2240	4610	1030	370	214	15200
19	10400	39800	3460	1770	3320	2050	2090	1880	871	238	254	12800
20	4430	54800	3250	1760	2690	1980	2030	1370	762	219	304	7070
21	2440	40200	3180	1740	2450	1880	1840	1030	694	264	224	2930
22	1680	19500	3080	1710	2290	1820	1670	1050	653	338	182	935
23	1500	8200	3080	1670	2190	1770	1690	986	722	325	181	489
24	1180	6510	3080	1640	2120	1740	1630	932	1350	324	182	546
25	1210	5240	2990	1600	2070	1690	1560	884	1160	318	195	484
26	990	5070	2800	1570	2010	1650	1490	846	901	323	223	854
27	961	7180	2620	1540	1760	1620	1460	813	729	229	242	2730
28	766	6330	2520	1530	1830	1600	1540	655	1460	196	260	1030
29	1040	4780	2510	1480	---	1470	1460	695	1090	196	270	2310
30	3760	4280	2450	1370	---	1310	1380	698	985	207	260	48000
31	2980	---	2400	1460	---	1450	---	686	---	211	238	---
TOTAL	50865	444276	208090	57070	81670	64220	122080	44332	42106	11626	8036	112679
MEAN	1641	14810	6713	1841	2917	2072	4069	1430	1404	375	259	3756
MAX	10400	54800	24000	2370	5830	6090	22100	4610	4950	856	350	48000
MIN	318	738	2400	1370	1460	1310	1380	655	653	196	181	170
AC-FT	100900	881200	412700	113200	162000	127400	242100	87930	83520	23060	15940	223500
CAL YR 1985	TOTAL 2037350	MEAN 5582	MAX 99900	MIN 283	AC-FT 4041000							
WTR YR 1986	TOTAL 1247050	MEAN 3417	MAX 54800	MIN 170	AC-FT 2474000							

## ARKANSAS RIVER BASIN

07189000 ELK RIVER NEAR TIFF CITY, MO

LOCATION.--Lat 36°37'50", long 94°35'12", in NE 1/4 sec.22, T.22 N., R.34 W., McDonald County, Hydrologic Unit 11070208, on downstream side of second pier from right bank of bridge on State Highway 43, 0.8 mi downstream from Blackfoot Branch, 2.8 mi upstream from Buffalo Creek, 3.0 mi southeast of Tiff City, and at mile 15.8.

DRAINAGE AREA.--872 mi<sup>2</sup>.

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

REVISED RECORDS.--WSP 927: 1940. WSP 1117: Drainage area.

GAGE.--Water stage recorder. Datum of gage is 750.61 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Sept. 6, 1960 to Aug. 25, 1961, at site 100 ft downstream.

REMARKS.--Estimated daily discharges: July 7 to Aug. 26, Aug. 28 to Sept. 14. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--47 years, 797 ft<sup>3</sup>/s, 12.41 in/yr, 577,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 137,000 ft<sup>3</sup>/s Apr. 19, 1941, gage height, 28.4 ft, from floodmark, from rating curve extended above 60,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum daily discharge, 5.1 ft<sup>3</sup>/s, Sept. 5-6, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft<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)
Nov. 16	0800	10,400	12.03	Dec. 1	1900	13,000	13.46
Nov. 19	0300	30,300	20.06	Apr. 8	1530	*58,700	*23.52

Minimum daily discharge, 72 ft<sup>3</sup>/s Sept. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	169	541	9560	1140	609	1010	817	869	407	463	86	87
2	167	496	6900	1110	614	975	819	905	416	408	84	86
3	161	447	3900	1090	646	947	861	825	449	364	82	84
4	154	405	2930	1060	901	917	4150	764	442	328	81	83
5	151	376	2400	1030	967	890	6210	713	416	299	80	81
6	146	350	2060	1000	1010	873	3690	672	479	277	140	79
7	142	330	1840	980	1480	849	2860	630	1990	260	210	78
8	139	310	1680	950	1860	829	33700	587	1960	240	185	77
9	139	291	1570	922	1840	816	13100	542	1770	225	162	76
10	139	281	2180	904	1740	814	5720	500	1820	215	150	75
11	140	271	6630	885	1640	814	3830	563	1470	200	140	74
12	145	898	7050	868	1530	998	2900	641	1170	190	134	74
13	173	2960	4290	851	1440	1450	2380	559	950	185	127	73
14	303	6710	3160	834	1380	1530	2100	510	792	176	122	72
15	606	7250	2570	816	1340	1470	1880	1000	683	170	118	114
16	566	8450	2240	804	1310	1390	1640	1230	594	160	200	496
17	466	3880	2030	790	1420	1320	1480	1200	524	150	180	1200
18	519	9810	1880	780	1550	1260	1390	1310	466	145	160	916
19	864	23700	1750	765	1550	1230	1280	1200	421	135	148	608
20	1000	12300	1680	750	1490	1170	1230	1040	390	126	140	435
21	863	6120	1600	732	1410	1120	1260	869	362	122	134	375
22	734	4130	1540	722	1330	1080	1270	789	336	117	126	322
23	629	3040	1490	707	1270	1040	1200	706	318	113	119	288
24	551	2410	1440	693	1210	1010	1120	642	306	110	113	258
25	486	2030	1390	681	1170	986	1050	607	287	108	107	235
26	435	2170	1340	651	1120	964	971	590	278	104	103	222
27	398	2290	1310	632	1090	938	912	571	268	99	99	232
28	368	1890	1260	630	1050	913	888	520	286	97	97	255
29	363	1670	1230	611	---	888	837	477	523	94	94	312
30	446	1610	1200	613	---	864	779	441	555	91	91	14000
31	536	---	1170	616	---	839	---	413	---	88	89	---
TOTAL	12098	107416	83270	25617	35967	32194	102324	22885	21128	5859	3901	21367
MEAN	390	3581	2686	826	1285	1039	3411	738	704	189	126	712
MAX	1000	23700	9560	1140	1860	1530	33700	1310	1990	463	210	14000
MIN	139	271	1170	611	609	814	779	413	268	88	80	72
CFSM	.45	4.11	3.08	.95	1.47	1.19	3.91	.85	.81	.22	.14	.82
IN.	.52	4.58	3.55	1.09	1.53	1.37	4.37	.98	.90	.25	.17	.91
AC-FT	24000	213100	165200	50810	71340	63860	203000	45390	41910	11620	7740	42380
CAL YR 1985 TOTAL	624409	MEAN	1711	MAX	24900	MIN	139	CFSM	1.96	IN.	26.64	AC-FT 1239000
WTR YR 1986 TOTAL	474026	MEAN	1299	MAX	33700	MIN	72	CFSM	1.49	IN.	20.22	AC-FT 940200

## 07190000 LAKE O' THE CHEROKEES AT LANGLEY, OK

LOCATION.--Lat 36°28'17", long 95°02'19", in SW 1/4 sec.14, T.23 N., R.21 E., Mayes County, Hydrologic Unit 11070209, on upstream side of pier at intake structure near right end of Pensacola Dam on Neosho River at Langley, 9.9 mi upstream from Big Cabin Creek, and at mile 77.0.

DRAINAGE AREA.--10,298 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1940 to current year. Prior to October 1940, published as Grand Lake at Langley.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1.10 ft, U.S. Army Corps of Engineers datum. Prior to Nov. 14, 1941, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by multiple-arch concrete dam, with top of taintor-type spillway gates at gage height 755.0 ft. Storage began Mar. 21, 1940; power-pool was first filled Apr. 19, 1941. Capacity between gage heights 682.0 ft, sill of powerhouse penstock, and 745.0 ft, maximum power pool is 1,492,000 acre-ft. Capacity between gage heights 745.0 ft and 755.0 ft is 525,000 acre-ft, and is reserved for flood control. Dead storage below gage height 682.0 ft is 180,200 acre-ft. Figures given herein represent total contents. Reservoir is utilized for power development and flood control.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 2,213,000 acre-ft, May 25, 1957, gage height, 755.27 ft, minimum since power-pool was first filled, 642,900 acre-ft, Sept. 28, 1954, gage height, 713.41 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 2,126,000 acre-ft, Nov. 22, gage height, 753.79 ft; minimum, 1,487,000 acre-ft Mar. 9, gage height, 740.84 ft.

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

739	1,411,000	747	1,767,000
741	1,494,000	751	1,970,000
744	1,626,000	754	2,138,000

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1537000	1758000	1898000	1615000	1500000	1516000	1503000	1590000	1545000	1505000	1579000	1533000
2	1548000	1753000	1918000	1606000	1497000	1512000	1499000	1584000	1544000	1499000	1582000	1533000
3	1545000	1747000	1891000	1595000	1493000	1500000	1505000	1574000	1545000	1497000	1583000	1534000
4	1541000	1741000	1860000	1585000	1509000	1496000	1548000	1559000	1543000	1501000	1581000	1536000
5	1541000	1733000	1823000	1573000	1538000	1494000	1613000	1546000	1549000	1510000	1583000	1536000
6	1540000	1726000	1785000	1572000	1545000	1495000	1645000	1532000	1555000	1510000	1585000	1539000
7	1534000	1719000	1755000	1569000	1552000	1496000	1682000	1527000	1562000	1512000	1582000	1536000
8	1538000	1717000	1728000	1565000	1561000	1492000	1793000	1517000	1558000	1511000	1585000	1534000
9	1536000	1723000	1714000	1562000	1571000	1490000	1817000	1509000	1551000	1505000	1589000	1533000
10	1531000	1725000	1725000	1558000	1577000	1494000	1807000	1514000	1544000	1513000	1589000	1526000
11	1518000	1726000	1779000	1553000	1579000	1500000	1788000	1514000	1553000	1527000	1584000	1528000
12	1516000	1765000	1802000	1550000	1580000	1508000	1778000	1510000	1552000	1543000	1586000	1533000
13	1525000	1843000	1789000	1544000	1578000	1522000	1762000	1514000	1549000	1559000	1581000	1539000
14	1546000	1925000	1763000	1541000	1573000	1523000	1757000	1519000	1547000	1563000	1579000	1540000
15	1565000	1956000	1732000	1537000	1563000	1520000	1754000	1513000	1551000	1568000	1578000	1544000
16	1571000	1960000	1714000	1537000	1563000	1515000	1747000	1508000	1550000	1579000	1571000	1562000
17	1576000	1933000	1711000	1535000	1569000	1509000	1733000	1519000	1545000	1587000	1563000	1574000
18	1599000	1964000	1705000	1533000	1577000	1506000	1718000	1552000	1539000	1595000	1556000	1599000
19	1647000	2045000	1704000	1531000	1580000	1507000	1707000	1584000	1534000	1599000	1548000	1617000
20	1680000	2098000	1699000	1528000	1582000	1506000	1693000	1607000	1528000	1604000	1540000	1620000
21	1706000	2125000	1691000	1528000	1574000	1502000	1680000	1599000	1523000	1604000	1537000	1614000
22	1711000	2108000	1687000	1525000	1570000	1503000	1664000	1588000	1523000	1603000	1533000	1599000
23	1712000	2062000	1679000	1522000	1564000	1502000	1652000	1585000	1509000	1600000	1534000	1580000
24	1718000	2021000	1674000	1521000	1559000	1500000	1643000	1585000	1507000	1594000	1533000	1565000
25	1720000	1982000	1666000	1521000	1549000	1498000	1635000	1586000	1506000	1591000	1533000	1557000
26	1723000	1956000	1662000	1518000	1549000	1499000	1630000	1581000	1505000	1594000	1537000	1560000
27	1726000	1927000	1656000	1512000	1534000	1498000	1621000	1570000	1510000	1593000	1538000	1559000
28	1731000	1902000	1649000	1510000	1525000	1497000	1616000	1562000	1516000	1587000	1535000	1545000
29	1738000	1877000	1642000	1508000	---	1495000	1604000	1555000	1511000	1580000	1533000	1554000
30	1754000	1860000	1633000	1506000	---	1496000	1594000	1552000	1506000	1578000	1534000	1764000
31	1760000	---	1624000	1502000	---	1500000	---	1548000	---	1578000	1534000	---
MAX	1760000	2125000	1918000	1615000	1582000	1523000	1817000	1607000	1562000	1604000	1589000	1764000
MIN	1516000	1717000	1624000	1502000	1493000	1490000	1499000	1508000	1505000	1497000	1533000	1526000
(+)	746.86	748.87	743.96	741.18	741.71	741.15	743.29	742.26	741.29	742.94	741.92	746.93
(++)	+235,000	+100,000	-236,000	-122,000	-23,000	-25,000	+94,000	-46,000	-42,000	+72,000	-44,000	+230,000
CAL YR 1985	MAX	2125000	MIN	1513000	(++)	-183,000						
WTR YR 1986	MAX	2125000	MIN	1490000	(++)	+239,000						

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

LOCATION.--Lat 36°26'15", long 95°02'44", in SE 1/4 sec.27, T.23 N., R.21 E., Mayes County, Hydrologic Unit 11070209, in concrete stilling well on left bank, 0.5 mi upstream from bridge on State Highway 82, 1.5 mi south of Langley, 3.6 mi downstream from Pensacola Dam, 6.3 mi upstream from Big Cabin Creek, and at mile 73.4.

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

REVISID RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 607.65 ft, U.S. Army Corps of Engineers datum. Prior to Feb. 16, 1940, nonrecording gage at site 0.1 mi upstream at same datum. Feb. 10, 1954 to Sept. 30, 1963, water-stage recorder at site 0.5 mi downstream at same datum. Auxiliary water-stage recorders at sites 2.0 and 3.0 mi upstream at same datum.

REMARKS.--Estimated daily discharges: Jan. 13 to Apr. 7, Apr. 24 to June 30, and Aug. 11 to Sept. 10. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Low flow values of 25 ft<sup>3</sup>/s consist of estimated base flow (since July 1964). Flow regulated since 1940 by Lake O' The Cherokees (station 0719000).

AVERAGE DISCHARGE.--47 years, 7,094 ft<sup>3</sup>/s, 5,140,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 300,000 ft<sup>3</sup>/s, May 20, 1943, gage height, 45.5 ft, from floodmarks, from computation of outflow from Lake O' the Cherokees; minimum daily, 9 ft<sup>3</sup>/s, Mar. 25, 1940 (caused by closure of Pensacola Dam).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 98,200 ft<sup>3</sup>/s, Nov. 21, gage height, 33.13 ft; minimum daily discharge, 25 ft<sup>3</sup>/s at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11900	17600	23200	11200	3850	8320	1820	11100	5400	3290	365	1550
2	12100	17400	30800	11300	3920	7510	6900	10800	3080	4770	25	1340
3	11600	17300	37700	11200	6520	7660	3580	10800	5120	5220	25	1110
4	10700	17000	33000	10700	9130	5240	9160	10600	7100	4430	1800	1260
5	11900	16700	33800	10500	9190	4200	9500	10700	5560	2750	766	1110
6	11700	16400	31700	8020	9190	2280	9470	10200	8010	4730	101	800
7	11700	16200	26400	5040	9370	2970	10500	6730	7650	3320	1220	1240
8	9510	15700	24700	5950	9260	2950	19800	7560	12200	4750	897	730
9	9430	11100	19200	5400	9300	2990	39100	6220	7400	7020	25	860
10	9080	11400	14100	5470	9290	1850	39700	2670	14700	342	1370	2860
11	12500	11400	25800	5630	9380	4850	29900	3260	10100	1700	5130	1440
12	11900	11600	42900	5500	9270	5480	19900	5290	8180	25	4270	793
13	12100	25900	38200	5250	8620	9080	19300	2270	7150	7940	4410	742
14	12300	57400	31700	5240	7880	8900	19000	1800	5340	10400	5310	873
15	11600	93800	30000	4970	7980	7930	17800	8180	3760	5600	4230	3730
16	12000	97700	22700	3810	6260	7810	16500	11000	2740	2750	5440	5890
17	9330	95000	15100	3830	6080	7640	16300	11100	4170	4050	5390	9660
18	12100	84100	12500	4160	6770	6300	16300	11100	6060	2350	6230	9230
19	12600	83600	12500	4000	8480	3500	12700	11200	2830	25	5220	9690
20	12500	91100	12100	3850	8620	4120	11100	11300	4410	25	4920	10200
21	12500	81700	12400	3970	8960	5580	11200	11300	8440	828	1640	10000
22	12200	62300	12300	4350	8370	3760	11200	11300	5230	1260	2700	10100
23	12600	38600	12400	3930	8930	4490	9820	11100	4360	2250	970	11700
24	12600	28500	11200	3350	8030	4060	8990	11200	4260	4650	220	10700
25	12500	27300	12100	3960	8120	4060	8380	11200	3420	2840	590	7150
26	12600	26500	11700	5350	7990	3770	7350	11200	1350	329	730	6700
27	12600	24500	11700	5350	7870	3460	7020	11200	1660	825	710	11700
28	12600	23300	11200	3790	7760	3130	8860	10600	2010	4210	1500	11000
29	12700	22800	11200	3940	---	3490	8300	7900	6520	3750	1130	12200
30	13700	22100	11600	4100	---	2370	9410	4970	2930	1840	690	31500
31	17200	---	11200	3900	---	520	---	4720	---	833	1220	---
TOTAL	372350	1166000	647100	177010	224390	150270	418860	270570	171140	99102	69244	187858
MEAN	12010	38870	20870	5710	8014	4847	13960	8728	5705	3197	2234	6262
MAX	17200	97700	42900	11300	9380	9080	39700	11300	14700	10400	6230	31500
MIN	9080	11100	11200	3350	3850	520	1820	1800	1350	25	25	730
AC-FT	738600	2313000	1284000	351100	445100	298100	830800	536700	339500	196600	137300	372600
CAL YR 1985	TOTAL 6481200 MEAN 17760 MAX 133000 MIN 242 AC-FT 12860000											
WTR YR 1986	TOTAL 3953890 MEAN 10830 MAX 97700 MIN 25 AC-FT 7843000											

## ARKANSAS RIVER BASIN

97

## 07191000 BIG CABIN CREEK NEAR BIG CABIN, OK

LOCATION.--Lat 36°34'06", long 95°09'07", in NE 1/4 NE 1/4 sec.15, T.24 N., R.20 E., Craig County, Hydrologic Unit 11070209, near downstream side of right bank end of county road bridge, 4.9 mi northeast of Big Cabin, 0.9 mi downstream from White Oak Creek, 6.8 mi upstream from Mustang Creek, and at mile 13.0.

DRAINAGE AREA.--450 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1947 to current year.

GAGE.--Water-stage recorder. Datum of gage is 622.00 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 30, 1972, water-stage recorder at site 4.5 mi downstream at same datum and present site used as supplemental gage.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Low flow sustained in part by sewage from city of Vinita.

AVERAGE DISCHARGE.--39 years, 323 ft<sup>3</sup>/s, 9.41 in/yr, 234,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 52,000 ft<sup>3</sup>/s, Oct. 3, 1959, gage height, 34.55 ft, at former site; maximum gage height, 46.65 ft, Feb. 23, 1985; minimum discharge, 0.10 ft<sup>3</sup>/s at times in 1954, 1956, and 1963.

EXTREMES FOR OUTSIDE PERIOD OF RECORD.--Flood of May 18, 1943, reached a stage of 34.96 ft at former site; discharge, 63,000 ft<sup>3</sup>/s, by slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft<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)
Nov. 13	1745	18,400	37.65	Nov. 18	2400	13,000	34.48
Nov. 15	0400	20,600	38.58	Sept. 30	2330	*32,900	*42.86

Minimum daily discharge, 0.85 ft<sup>3</sup>/s, Sept. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	226	3830	98	25	40	30	392	26	36	1.3	.90
2	47	139	885	93	25	37	40	253	31	18	1.6	.90
3	32	96	380	89	26	33	144	103	80	14	1.6	.90
4	17	71	330	84	79	31	4110	70	454	9.6	1.5	.90
5	11	54	302	77	132	29	1560	55	872	6.7	1.2	.90
6	7.3	43	269	70	165	28	484	44	1170	5.8	11	.90
7	4.2	34	246	65	545	26	1190	40	1180	5.0	7.1	.85
8	2.9	28	222	54	307	25	4250	34	313	4.5	11	.86
9	2.4	20	214	50	215	23	841	30	171	3.9	10	.90
10	2.3	17	1160	47	164	25	326	29	148	3.0	18	.90
11	3.5	15	7040	47	115	61	247	115	110	2.7	8.0	.86
12	5.8	2320	1910	47	94	2500	190	189	133	10	4.6	.86
13	10	14400	579	47	85	1080	152	80	99	1920	2.5	.86
14	1050	15500	370	47	83	326	267	49	63	1760	2.0	.86
15	1410	18000	331	49	97	206	293	67	44	251	2.5	3.9
16	266	5200	353	49	201	152	156	104	33	108	4.5	1410
17	122	764	367	49	242	121	127	1900	22	65	3.3	1390
18	2870	5520	320	49	175	109	204	1080	16	40	2.4	274
19	3190	11000	243	49	123	105	185	294	13	24	3.2	104
20	417	6190	192	49	99	84	355	154	10	15	1.7	54
21	208	793	166	49	82	69	316	102	8.6	12	1.7	28
22	124	489	178	45	69	57	169	79	7.6	7.9	1.5	15
23	84	362	224	39	61	54	117	64	7.2	6.0	1.3	8.8
24	61	293	220	35	56	50	93	54	7.5	4.1	1.2	5.9
25	45	261	162	32	54	45	77	67	21	3.8	1.0	3.9
26	34	1550	116	29	51	43	66	47	27	3.3	.91	263
27	25	864	109	27	49	39	62	36	19	3.3	.90	4020
28	17	387	102	25	44	36	81	30	199	2.8	.94	400
29	1600	277	99	25	---	33	101	27	144	2.3	.96	1290
30	2900	395	97	25	---	32	94	31	71	2.0	.90	23000
31	451	---	97	25	---	31	---	23	---	1.5	.90	---
TOTAL	15047.4	85308	21113	1565	3463	5530	16327	5642	5499.9	4351.2	111.21	32282.85
MEAN	485	2844	681	50.5	124	178	544	182	183	140	3.59	1076
MAX	3190	18000	7040	98	545	2500	4250	1900	1180	1920	18	23000
MIN	2.3	15	97	25	25	23	30	23	7.2	1.5	.90	.85
AC-FT	29850	169200	41880	3100	6870	10970	32380	11190	10910	8630	221	64030

CAL YR 1985 TOTAL 300489.81 MEAN 823 MAX 37000 MIN .90 AC-FT 596000  
WTR YR 1986 TOTAL 196239.66 MEAN 538 MAX 23000 MIN .85 AC-FT 389200



## ARKANSAS RIVER BASIN

07191220 SPAVINAW CREEK NEAR SYCAMORE, OK

LOCATION.--Lat 36°20'07", long 94°38'24", in NE 1/4 NW 1/4 sec.4, T.21 N., R.25 E., Delaware County, Hydrologic Unit 11070209, on right bank 1.8 mi upstream from Cherokee Creek, 4.8 mi northeast of Row, 6.5 mi southeast of Sycamore, and at mile 35.0.

DRAINAGE AREA.--133 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 2121: 1965 (M).

GAGE.--Water-stage recorder. Altitude of gage is 875 ft, from topographic map.

REMARKS.--Estimated daily discharges: Jan. 20-28. Records good.

AVERAGE DISCHARGE.--25 years, 108 ft<sup>3</sup>/s, 11.03 in/yr, 78,250 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,800 ft<sup>3</sup>/s, July 27, 1975, gage height, 22.07 ft; minimum, 1.2 ft<sup>3</sup>/s Aug. 9, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--According to local residents, a flood of approximately the same magnitude as the July 27, 1975 flood occurred in the early 1880's.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft<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)
Nov. 18	2245	2,960	10.02	Sept. 30	1215	*11,400	*14.96
Apr. 8	0515	6,700	12.73				

Minimum daily discharge, 23 ft<sup>3</sup>/s Sept. 13, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	89	861	102	59	83	68	146	123	68	30	26
2	37	85	522	100	59	81	68	155	177	66	30	26
3	37	78	379	96	62	78	72	143	288	65	29	25
4	37	72	311	94	67	75	542	133	252	63	29	25
5	37	68	265	91	73	73	510	125	211	61	30	25
6	36	65	234	89	100	71	392	117	200	59	41	26
7	34	63	213	86	193	70	466	110	244	56	42	26
8	33	60	194	82	227	68	3600	104	263	54	56	26
9	32	58	180	80	213	68	871	100	253	51	59	26
10	32	56	310	78	192	67	487	98	211	50	59	25
11	32	54	800	76	169	68	362	97	188	48	55	24
12	32	53	586	73	151	116	299	105	170	47	52	24
13	33	52	423	72	138	206	254	102	150	48	49	23
14	39	53	336	70	130	196	239	98	134	47	47	23
15	54	106	289	69	123	173	213	214	123	48	44	25
16	116	212	256	68	122	151	195	244	113	48	43	25
17	104	182	235	67	126	134	182	285	106	47	47	58
18	140	1670	219	66	128	123	174	302	100	47	53	115
19	200	1710	207	65	125	115	164	256	93	45	53	97
20	205	895	193	64	122	107	178	216	88	42	50	85
21	169	538	180	63	115	102	203	186	83	40	47	75
22	142	400	169	63	109	97	201	165	81	39	44	67
23	122	328	159	62	105	91	188	147	78	37	41	61
24	103	279	150	62	100	86	175	132	74	37	38	56
25	88	246	141	61	98	83	162	143	73	37	37	51
26	78	236	133	61	95	81	150	177	71	37	35	47
27	71	222	127	60	92	78	143	165	69	37	33	43
28	67	208	121	60	88	76	138	149	69	35	31	39
29	65	193	116	59	---	73	130	133	69	34	30	117
30	68	227	111	59	---	71	125	122	69	32	29	6130
31	83	---	107	59	---	70	---	114	---	31	28	---
TOTAL	2363	8558	8527	2257	3381	3031	10951	4783	4223	1456	1291	7441
MEAN	76.2	285	275	72.8	121	97.8	365	154	141	47.0	41.6	248
MAX	205	1710	861	102	227	206	3600	302	288	68	59	6130
MIN	32	52	107	59	59	67	68	97	69	31	28	23
CFSM	.57	2.14	2.07	.55	.91	.74	2.74	1.16	1.06	.35	.31	1.86
IN.	.66	2.39	2.38	.63	.95	.85	3.06	1.34	1.18	.41	.36	2.08
AC-FT	4690	16970	16910	4480	6710	6010	21720	9490	8380	2890	2560	14760
CAL YR 1985	TOTAL	76369	MEAN	209	MAX	2940	MIN	27	CFSM	1.57	IN.	21.36
WTR YR 1986	TOTAL	58262	MEAN	160	MAX	6130	MIN	23	CFSM	1.20	IN.	16.30
											AC-FT	151500
											AC-FT	115600

PERIOD OF RECORD.--Water years 1968, 1977, January 1980 to current year.

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	BARO-METRIC PRES-SURE	OXYGEN, DIS-SOLVED (MG/L)
										(MM OF HG)	
OCT 17...	1305	1028	80020	4.08	99	330	6.50	19.5	22.0	740	8.6
NOV 25...	1500	1028	80020	--	236	260	6.40	17.5	16.0	740	9.0
DEC 19...	1500	1028	80020	--	213	242	7.00	1.5	11.0	--	--
JAN 29...	1645	1028	80020	--	63	260	7.40	7.5	11.0	740	11.0
FEB 26...	1415	1028	80020	--	97	250	7.60	23.5	12.0	730	11.0
MAR 28...	1415	1028	80020	--	74	333	7.80	22.5	14.0	740	11.0
APR 29...	1815	1028	80020	--	125	240	7.90	27.0	16.0	740	9.5
MAY 22...	1530	1028	80020	--	165	290	7.87	18.0	18.0	730	9.9
JUN 27...	1445	1028	80020	--	71	270	7.60	34.0	21.0	740	8.0
JUL 24...	1400	1028	1028	--	36	305	7.40	37.0	21.0	740	6.9

[illegible]

07191220 SPAVINAW CREEK NEAR SYCAMORE, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[illegible]

## ARKANSAS RIVER BASIN

101

## 07191400 LAKE HUDSON NEAR LOCUST GROVE, OK

LOCATION.--Lat 36°13'54", long 95°11'36", in SE 1/4 NW 1/4 sec.9, T.20 N., R. 20 E., Mayes County, Hydrologic Unit 11070209, at left side of Robert S. Kerr dam on Neosho River, 2.0 mi northwest of Locust Grove, 3.5 mi downstream from Salina Creek, and at mile 47.3.

DRAINAGE AREA.--11,534 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Remote-controlled indicator and non-recording gage. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth dam and concrete spillway controlled by seventeen 22-foot taintor gates. Storage began Nov. 12, 1963; power pool first filled June 12, 1964. Capacity, 444,500 acre-ft at elevation 636.0 ft, top of taintor gages, 200,300 acre-ft at elevation 619.0 ft, power pool, and 48,630 acre-ft at elevation 599.0 ft, top of spillway crest. Figures given herein represent total contents. Reservoir was designed for flood control and power development.

COOPERATION.--Records furnished by Grand River Dam Authority.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 436,300 acre-ft, Nov. 9, 1974, elevation, 635.56 ft; minimum since power pool first filled, 174,300 acre-ft, Apr. 1, 1986, elevation, 616.51 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 408,000 acre-ft, Nov. 22, elevation, 633.99 ft; minimum, 174,300 acre-ft, Apr. 11, elevation, 616.51 ft.

## MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	619.26	203,200	-
Oct. 31.....	620.00	211,400	+8,200
Nov. 30.....	627.60	307,300	+95,900
Dec. 31.....	619.24	203,000	+104,300
CAL YR 85.....	-	-	-29,100
Jan. 31.....	619.19	202,400	-600
Feb. 28.....	618.78	197,900	-4,500
Mar. 31.....	617.05	179,800	-18,100
Apr. 30.....	619.22	202,700	+22,900
May 31.....	619.04	200,700	-2,000
June 30.....	619.22	202,700	+2,000
July 31.....	619.17	202,200	-500
Aug. 31.....	619.02	200,500	-1,700
Sept. 30.....	626.11	286,700	+86,200
WTR YR 86.....	-	-	+83,500

## ARKANSAS RIVER BASIN

07191500 NEOSHO RIVER NEAR CHOUTEAU, OK

LOCATION.--Lat 36°13'45", long 95°10'59", in SE 1/4 NW 1/4 sec.9, T.20 N., R.20 E., Mayes County, Hydrologic Unit 11070209, on left bank, 300 ft downstream from Robert S. Kerr Dam, 2.2 mi northwest of Locust Grove, 10 mi northeast of Chouteau, and at mile 47.2.

DRAINAGE AREA.--11,534 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1937 to September 1950, October 1963 to current year.

REVISED RECORDS.--WSP 1117: Drainage area. WDR OK-86-1: 1979.

GAGE.--Water-stage recorder. Datum of gage is 554.00 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Apr. 3, 1941, nonrecording gage at bridge on State Highway 33, 8.2 mi downstream, at datum 17.63 ft lower. Apr. 3, 1941 to Sept. 30, 1950, and Oct. 1963 to Apr. 6, 1964, at site 2.5 mi downstream, at datum 2.17 ft lower. Supplemental water-stage recorder Oct. 4, 1963, to July 10, 1973, at site 8.2 mi downstream.

REMARKS.--Estimated daily discharges: Nov. 15 to Dec. 10, and Dec. 22 to Jan 27. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation since 1940 by Lake O' The Cherokees (station 07190000), and completely regulated since 1963 by Lake Hudson (station 07191400).

AVERAGE DISCHARGE.--Since regulation by Lake Hudson, 23 years (water years 1964-86), 8,130 ft<sup>3</sup>/s, 5,890,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 400,000 ft<sup>3</sup>/s, May 20, 1943, gage height, 45.00 ft, site and datum then in use, from rating curve extended above 140,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum daily discharge, 12 ft<sup>3</sup>/s, Nov. 13, 1963 (caused by closure of Robert S. Kerr Dam).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 96,400 ft<sup>3</sup>/s, Nov. 16; minimum daily discharge, 182 ft<sup>3</sup>/s, Sept. 8.

REVISIONS.--Revised figures of discharge for the water year 1979, superseding those published in the report for 1979, are given below.

June 23.... 738	July 5....13,500	July 16....13,200	July 27.... 6,110
24....11,800	6....11,200	17....13,500	28.... 9,610
25....12,100	7....15,500	18....12,000	29.... 2,440
26....13,600	8....11,100	19....12,400	30.... 3,180
27....15,700	9....11,100	20....14,100	31.... 9,080
28.... 9,900	10....18,000	21....11,900	Aug. 1....13,500
29....14,000	11....19,900	22....11,500	2....17,200
30.... 8,770	12....20,200	23....14,900	3....15,500
July 1....12,500	13....28,800	24....14,000	4.... 9,530
2....13,800	14....17,800	25....12,800	5....13,900
3....13,900	15....14,900	26.... 4,300	6....15,700
4....13,400			

	TOTAL	MEAN	MAX	MIN	AC-FT
June 1979	342,433	11,410	21,500	597	679,200
July 1979	400,620	12,920	28,800	2,440	794,600
August 1979	22,831	7,365	17,200	335	452,900
Wtr Yr 1979	2,334,160	6,395	28,800	116	4,630,000
Cal Yr 1979	2,634,640	7,218	28,800	147	5,226,000



## 103

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11800	16100	33100	9620	6430	8020	5520	14300	6250	2390	266	17500
2	10600	14700	37000	14000	5200	8500	3360	11400	3460	6750	241	12500
3	10900	17300	42300	15200	10000	8420	671	12300	5870	6850	230	16200
4	8470	12500	41600	14800	11500	9380	14600	11600	8350	4880	2810	7220
5	13000	11800	41500	8780	10200	4620	17600	14600	6360	4140	770	24800
6	10400	14700	37300	7260	11600	706	17900	12700	8890	4220	215	27500
7	11600	16400	31300	8170	10800	2950	15300	7680	8450	3570	4800	20300
8	7780	16900	27100	8030	12400	4280	25600	9690	13100	5800	657	18200
9	10400	11900	28000	7820	10100	3540	34900	7830	8480	10500	211	19100
10	8910	17100	25500	5290	13400	4410	36000	1250	16200	289	1950	8670
11	11300	11400	27900	7100	7820	7570	30200	4500	11100	1230	6010	19000
12	11900	11100	36900	9100	11700	7820	20800	7350	9370	225	5300	21300
13	13800	21100	37000	5560	10600	13800	21300	3010	8380	13200	5400	17800
14	11700	54800	33000	6780	11200	9310	21300	4900	6300	9840	6130	15800
15	15900	89600	33000	5990	11000	12000	21200	9860	4640	10400	6030	60900
16	10300	96400	31700	2920	4440	10500	21600	12400	3890	2770	7200	68900
17	11000	87600	20900	8010	5720	7050	20500	18100	4530	6650	5670	19100
18	14600	75700	16500	554	11400	11100	21200	14200	6880	2920	6970	83500
19	19300	73600	16900	5450	11100	5000	19400	13900	3510	415	6340	129000
20	12300	88600	13500	2630	10500	4910	17700	16800	5170	285	4920	68000
21	11700	83600	13800	3430	9980	10400	14100	12700	9650	587	3950	124000
22	10300	72600	10600	3960	10300	2620	15600	10900	5680	230	2610	109000
23	12400	53700	14600	4130	9210	6120	13200	15800	5350	2310	586	128000
24	11700	42100	17000	275	12800	5440	11800	11100	4410	4320	210	107000
25	11700	40500	11800	4960	8130	7530	10600	13500	4530	3120	199	98100
26	12000	36700	7020	9690	11400	1860	7380	15100	1980	693	457	82700
27	12800	34900	23800	3140	6210	6950	8160	13500	2010	272	383	138000
28	9970	33200	9660	8690	13000	5140	13200	9410	2840	8520	3590	160000
29	11900	33500	12300	5010	---	8100	8600	13100	7090	2320	337	165000
30	14500	33300	14500	5820	---	3630	10700	4500	3720	1590	2340	538000
31	17200	---	17200	4610	---	7410	---	5190	---	1500	1500	---
TOTAL	372130	1223400	764280	206779	278140	209086	499991	333170	196440	122786	88282	248061
MEAN	12000	40780	24650	6670	9934	6745	16670	10750	6548	3961	2848	8269
MAX	19300	96400	42300	15200	13400	13800	36000	18100	16200	13200	7200	53800
MIN	7780	11100	7020	275	4440	706	671	1250	1980	225	199	182
AC-FT	738100	2427000	1516000	410100	551700	414700	991700	660800	389600	243500	175100	492000
CAL YR 1985	TOTAL 7145270											
CAL YR 1986	TOTAL 4542540											
MEAN	19580	MEAN	12450	MAX	125000	MIN	221	AC-FT	14170000			
MAX	182	AC-FT	9010000									

## ARKANSAS RIVER BASIN

## 07193000 FORT GIBSON LAKE NEAR FORT GIBSON, OK

LOCATION.--Lat 35°52'16", long 95°13'43", in NW 1/4 NW 1/4 sec.18, T.16 N., R.20 E., Cherokee County, Hydrologic Unit 11070209, in control tower near left end of Fort Gibson Dam on Neosho River, 4.0 mi north of Fort Gibson, and at mile 7.7.

DRAINAGE AREA.--12,492 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1949 to current year. Prior to October 1970, published as Fort Gibson Reservoir near Fort Gibson.

REVISED RECORDS.--WSP 1731: 1950 (M).

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929. Prior to Jan. 13, 1950, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by concrete-gravity and earth-fill dam. Spillway is concrete ogee-type weir controlled by thirty 40-foot taintor gates; outlet works consists of ten, 5-foot, 8-inch by 7-foot sluice gates. Regulated storage began Sept. 5, 1949; power pool was first maintained in 1953. Capacity, 1,284,000 acre-ft at elevation 582.0 ft, flood control pool, 365,200 acre-ft at elevation 554.0 ft (maximum power pool), and 311,300 acre-ft at elevation 551.0 ft (minimum power pool). Figures given herein represent total contents. Reservoir was designed for flood control and power development.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,278,000 acre-ft, May 12, 1961, elevation, 581.88 ft; minimum since first use of power pool, 303,800 acre-ft, May 26, 1955, elevation, 550.56 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,171,000 acre-ft, Nov. 21, elevation, 579.70 ft; minimum, 342,200 acre-ft, Jan. 13, elevation 552.65 ft.

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

552	328,500	568	711,900
557	425,400	574	923,800
562	541,600	580	1,186,000

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	392900	425600	683300	393500	372800	372000	376400	392300	382900	370500	354200	376600
2	392100	413600	646600	392100	369200	376000	370300	390900	374500	372800	355100	376600
3	386300	409900	613100	394500	376800	377400	372800	391700	378500	375300	355100	374900
4	388100	394900	581100	397100	381300	380100	398900	390700	390100	377000	354000	374300
5	387500	383700	552900	392900	383100	372200	411100	398500	400500	375100	355700	374100
6	388100	384900	522400	390700	388700	356800	426700	399500	406300	374700	353800	376200
7	386500	388100	494800	378500	388500	354000	429600	392100	408400	372800	359900	376600
8	380300	394700	474000	372400	390900	358700	436000	386700	413000	371300	357400	372600
9	381700	395500	467100	359700	388100	359500	456700	380500	408200	380700	359500	369200
10	379500	404500	473800	350300	392500	361800	467600	371300	419500	372600	363300	367900
11	377700	400900	494800	348700	385500	369400	457600	364800	419700	365200	370900	366300
12	382900	400300	518400	348800	385100	376400	430400	363500	417000	364400	369000	366500
13	408600	401900	528400	342700	381900	396300	410700	355300	412800	387500	369000	367100
14	439100	449200	518600	344900	378900	399700	394900	357400	401500	390900	369200	368800
15	450100	572700	508700	351400	378500	406500	390500	369800	386900	396900	376200	377700
16	438400	689800	498800	350800	365600	409600	392500	373600	378900	387900	382100	378700
17	426400	757300	479500	354800	357400	400300	392500	424400	377000	392300	384500	396900
18	466000	829900	456200	357400	371800	398500	400500	449900	380900	387300	386500	390900
19	507700	997000	445200	365200	370900	385100	414500	451400	378700	378900	387500	391900
20	504400	1115000	436400	359500	369000	377000	427300	444600	380500	378100	387300	382500
21	485000	1171000	431700	363900	362200	380300	418000	430400	393500	375100	387300	383500
22	455100	1163000	426900	366200	357600	377000	407100	413400	396100	370700	381900	382300
23	431700	1129000	420200	368800	359500	379300	394500	410700	398500	370700	380500	382900
24	412400	1062000	429400	364200	362900	378500	376600	406500	392100	376200	376800	378500
25	400900	996600	409200	370100	360600	383500	370900	413000	391900	372200	369200	374500
26	396500	930500	398100	380100	370000	376600	368600	414500	382900	372400	369000	367300
27	396500	873400	405100	367100	365200	378300	368000	410700	375600	370500	369400	370900
28	391900	821600	401300	368000	372400	376600	377400	396500	373400	376600	373200	377000
29	409600	764900	394500	369000	---	380300	376400	400700	374700	373400	373800	421000
30	426000	708700	395700	369600	---	376600	380100	388500	374500	367900	374700	608900
31	431700	---	400500	365000	---	377000	---	382900	---	362000	375600	---
MAX	507700	1171000	683300	397100	392500	409600	467600	451400	419700	396900	387500	608900
MIN	377700	383700	394500	342700	357400	354000	368000	355300	373400	362000	353800	366300
(+)	557.30	567.90	555.80	553.99	554.38	554.62	554.78	554.92	554.49	553.83	554.55	564.53
(++)	+38,800	+277,000	-308,200	-35,500	+7,400	+4,600	+3,100	+2,800	-8,400	-12,500	+13,600	+233,300
CAL YR 1985	MAX	1205000	MIN	341500	(++)	-115,600						
WTR YR 1986	MAX	1171000	MIN	342700	(++)	+216,000						

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET

## ARKANSAS RIVER BASIN

105

07193500 NEOSHO RIVER BELOW FORT GIBSON LAKE NEAR FORT GIBSON, OK

LOCATION.--Lat 35°51'15", long 95°13'45", in SE 1/4 NW 1/4 sec.19, T.16 N., R.20 E., Cherokee County, Hydrologic Unit 11070209, on left bank 1.1 mi downstream from Fort Gibson Dam, 3.5 mi north of Fort Gibson, and at mile 6.6.

DRAINAGE AREA.--12,495 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1950 to current year. Prior to October 1970, published as Neosho River below Fort Gibson Reservoir near Fort Gibson.

GAGE.--Water-stage recorder. Datum of gage is 483.75 ft, National Geodetic Vertical Datum of 1929.

May 11, 1950 to Aug. 20, 1951, nonrecording gage and Aug. 21, 1951 to June 11, 1952, water-stage recorder, at site 4.4 mi downstream at datum 8.00 ft lower and used as auxiliary gage since June 10, 1971.

REMARKS.--Estimated daily discharges: Dec. 24-30, June 25 to July 30. Records good. Flow completely regulated by Fort Gibson Lake (station 07193000).

AVERAGE DISCHARGE.--36 years, 8,128 ft<sup>3</sup>/s, 5,889,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 223,000 ft<sup>3</sup>/s May 26, 1957, gage height, 37.60 ft, minimum 12 ft<sup>3</sup>/s Oct. 10, 1957, Aug. 23, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1943 reached a stage of 43.0 ft, from high-water profile by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 82,900 ft<sup>3</sup>/s Nov. 23, maximum gage height, 21.96 ft Nov. 22, 23; minimum daily discharge, 15 ft<sup>3</sup>/s Aug. 3, 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11900	22700	59700	14100	1170	8210	6670	10400	7680	4780	4410	1640
2	11800	22400	58800	14100	6820	7420	7240	12400	8940	5340	19	2090
3	11900	22300	64200	13100	5670	6950	6580	12400	5830	4930	15	2420
4	11800	22200	62300	12300	9870	7180	12500	12400	4350	4800	2510	2110
5	12100	19000	60500	12400	10100	9230	18300	12400	6640	4780	15	2400
6	12100	16900	58700	12700	10300	9330	15600	12800	11100	4780	1420	1830
7	12300	16900	49200	12500	12500	4380	17800	12600	8720	4790	1190	2080
8	11900	15700	40600	12900	12400	1640	25600	12800	12200	6630	2900	2000
9	9910	14400	36500	12700	12300	1760	32500	11900	12100	5900	806	2590
10	11900	14400	32600	11700	12500	3880	36400	8840	12400	5030	497	2820
11	11700	14500	32300	8950	12700	6710	39900	8780	12300	5500	1430	2000
12	11900	14500	32700	8560	12800	9570	35600	8850	12300	7060	5510	2890
13	11700	22800	37400	8740	12900	5670	34200	6940	11600	5690	5730	1110
14	12500	37500	44700	5830	12900	8090	30900	4610	11900	11700	6140	988
15	15500	48200	45400	2760	12700	9430	25100	8790	12100	7810	4430	1460
16	18100	56200	44900	4460	12900	9300	22100	12300	7650	7850	4360	5180
17	19000	68500	39400	4540	11800	12000	22200	5610	5570	4970	4560	12400
18	9150	64600	29200	842	3180	14300	20200	5560	4170	5650	6340	11600
19	7660	16700	23100	1210	13000	12300	16200	14700	4060	5920	5040	12100
20	18100	35900	20200	5700	12800	9580	16300	21800	4470	2870	4770	12100
21	25200	68400	15200	1100	12900	10400	20000	21400	3300	2530	3760	12200
22	27000	82200	14500	2450	12900	4480	22200	21300	4280	3900	4730	12300
23	26500	82100	15000	2320	10200	4720	21700	18200	6190	2310	3260	12500
24	23600	81000	16600	3510	10700	5970	21300	17100	7710	2100	1820	12500
25	18500	79500	17600	1160	11800	5770	14700	16800	5410	5260	4410	12900
26	15500	77900	16200	2580	7870	5890	9730	17300	6540	740	1010	12700
27	15300	69400	14200	10500	8110	6130	9700	16800	6250	920	288	13000
28	14300	61900	13600	5540	8650	6050	9240	17200	4740	4000	817	12700
29	12500	63900	13600	4900	---	6230	9480	13900	5040	5260	261	9160
30	12500	66900	13600	4250	---	6110	9510	12000	4770	4800	1380	10300
31	17400	---	14100	6470	---	6640	---	8300	---	5060	1280	---
TOTAL	461220	1299500	1036600	224872	294440	225320	589450	397180	230310	153660	85108	204068
MEAN	14880	43320	33440	7254	10520	7268	19650	12810	7677	4957	2745	6802
MAX	27000	82200	64200	14100	13000	14300	39900	21800	12400	11700	6340	13000
MIN	7660	14400	13600	842	1170	1640	6580	4610	3300	740	15	988
AC-FT	914800	2578000	2056000	446000	584000	446900	1169000	787800	456800	304800	168800	404800
CAL YR 1985	TOTAL	8308024		MEAN	22760	MAX	82600	MIN	649	AC-FT	16479000	
WTR YR 1986	TOTAL	5201728		MEAN	14250	MAX	82200	MIN	15	AC-FT	10318000	

## ARKANSAS RIVER BASIN

07193500 NEOSHO RIVER BELOW FORT GIBSON LAKE NEAR FORT GIBSON, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1952 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1951 to September 1963, October 1973 to January 1982.

WATER TEMPERATURE: October 1951 to September 1963, October 1973 to January 1982.

REMARKS: Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	DIS- CHARGE, IN CUBIC FEET PER SECOND	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)
DEC 31...	1630	1028	80020	14100	--	225	7.80	12.0	5.0	23	738
JAN 22...	1600	1028	80020	2450	--	286	7.50	--	8.0	18	760
APR 23...	1430	1028	80020	21700	--	--	8.30	25.0	13.0	5.0	743
JUL 31...	1615	1028	80020	5060	--	290	8.20	34.5	30.0	1.5	746
AUG 26...	1430	1028	80020	1010	E2590	298	8.20	31.5	30.0	1.6	750
SEP 23...	1630	1028	80020	12500	12500	292	8.30	28.5	27.0	5.0	740

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS./ PER 100 ML)	HARD- NESS WH WAT TOT FLD (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
DEC 31...	--	--	--	--	92	25	30	4.2	4.9	10	0.2
JAN 22...	11.5	97	K4	K6	100	20	33	4.6	5.4	10	0.2
APR 23...	10.0	--	K4	K2	150	31	47	6.8	8.9	12	0.3
JUL 31...	5.8	79	40	38	120	28	38	6.0	9.2	14	0.4
AUG 26...	7.2	97	K10	K11	120	22	37	5.9	8.9	14	0.4
SEP 23...	6.8	88	--	--	130	30	40	6.6	10	14	0.4

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HC03)	CAR- BONATE IT-FLD (MG/L AS C03)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
DEC 31...	0.60	82	0	67	2.1	16	5.6	0.10	8.9	124	110
JAN 22...	3.9	99	0	81	5.0	20	7.2	0.10	8.7	136	130
APR 23...	2.7	139	0	114	1.1	43	9.9	0.10	3.7	197	190
JUL 31...	3.1	112	0	92	1.1	38	9.3	0.20	2.9	160	160
AUG 26...	3.0	116	0	95	1.2	34	8.8	0.20	3.9	164	160
SEP 23...	3.4	118	0	97	0.9	38	10	0.30	3.5	193	170

## ARKANSAS RIVER BASIN

107

07193500 NEOSHO RIVER BELOW FORT GIBSON LAKE NEAR FORT GIBSON, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)
DEC 31...	0.17	4720	0.730	3.2	0.010	0.03	0.740	0.090	0.080	0.10
JAN 22...	0.18	900	0.890	--	0.010	0.03	0.900	0.050	0.050	0.06
APR 23...	0.27	11500	0.870	--	0.020	0.07	0.890	0.040	0.050	0.06
JUL 31...	0.22	2190	--	--	--	--	--	--	--	--
AUG 26...	0.22	447	--	--	<0.010	--	<0.100	0.010	<0.010	--
SEP 23...	0.26	6510	0.170	--	0.010	0.03	0.180	<0.010	<0.010	--
DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
DEC 31...	0.61	0.70	0.110	0.34	0.070	0.050	0.15	40	<1	51
JAN 22...	0.55	0.60	0.100	--	0.070	0.070	0.21	--	--	--
APR 23...	0.56	0.60	0.060	--	0.040	0.030	0.09	--	--	--
JUL 31...	--	--	--	--	--	--	--	20	1	67
AUG 26...	0.79	0.80	0.060	--	0.030	0.020	0.06	--	--	--
SEP 23...	--	0.70	0.090	--	0.050	0.040	0.12	<10	<1	71
DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
DEC 31...	<0.5	<1	<1	<3	5	80	<1	<4	21	0.2
JAN 22...	--	--	--	--	--	--	--	--	--	--
APR 23...	--	--	--	--	--	--	--	--	--	--
JUL 31...	<0.5	<1	<1	<3	4	<3	<5	<4	120	0.1
AUG 26...	--	--	--	--	--	--	--	--	--	--
SEP 23...	<0.5	<1	<1	<3	3	37	<5	5	5	<0.1
DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
DEC 31...	<10	1	<1	<1	120	<6	39	22	838	98
JAN 22...	--	--	--	--	--	--	--	15	99	94
APR 23...	--	--	--	--	--	--	--	12	703	81
JUL 31...	<10	<1	<1	<1	190	<6	41	11	150	70
AUG 26...	--	--	--	--	--	--	--	15	41	46
SEP 23...	<10	1	<1	<1	210	<6	10	--	--	--

## ARKANSAS RIVER BASIN

07195500 ILLINOIS RIVER NEAR WATTS, OK

LOCATION.--Lat 36°07'48", long 94°34'12", in NE 1/4 sec.18, T.19 N., R.26 E., Adair County, Hydrologic Unit 11110103, near right bank on downstream side of pier of bridge on U.S. Highway 59, 1.5 mi north of Watts, 4.5 mi downstream from Cincinnati Creek, and at mile 106.2.

DRAINAGE AREA.--635 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1955 to current year.

GAGE.--Water-stage recorder. Datum of gage is 893.78 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Feb. 13-16, July 26 to Aug. 5. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation at low flow by Lake Frances Dam, 0.8 mi upstream. Since July 2, 1957, small diversion upstream for municipal water supply for city of Siloam Springs, Ark.

AVERAGE DISCHARGE.--31 years, 577 ft<sup>3</sup>/s, 12.35 in/yr, 418,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 68,000 ft<sup>3</sup>/s July 25, 1960, gage height, 25.96 ft, from rating curve extended above 51,000 ft<sup>3</sup>/s; minimum, 8.6 ft<sup>3</sup>/s Oct. 26, 1955, Sept. 19, Oct. 14, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 31,700 ft<sup>3</sup>/s, Sept. 30, stage rising, peak occurred Oct. 1, 1986. Peak discharges greater than base discharge of 6,500 ft<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)
Nov. 19	1300	*26,100	*21.94	Sept. 17	0515	6,780	11.55
Apr. 4	1945	9,000	13.20	Sept. 29	1930	6,960	11.70
Apr. 8	1430	23,100	21.21				

Minimum discharge, 80 ft<sup>3</sup>/s Aug. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	159	289	1800	467	261	385	320	865	506	317	165	99
2	161	282	1580	444	285	367	349	958	621	306	162	102
3	160	264	1120	434	298	357	517	753	867	296	160	103
4	155	243	966	418	310	349	4210	654	717	278	159	122
5	154	233	853	411	314	340	5050	593	584	252	158	154
6	153	219	765	392	677	338	2440	562	713	234	691	156
7	153	212	701	381	2050	325	1900	529	1000	234	772	151
8	147	225	648	378	1320	327	12300	497	2090	231	407	147
9	144	201	619	367	1110	323	5030	461	2280	227	377	152
10	144	183	3120	359	949	301	2310	459	1340	225	697	150
11	144	182	5030	356	838	344	1660	459	984	216	662	147
12	144	193	3520	348	747	1750	1330	428	846	225	424	234
13	150	197	2140	344	650	1500	1100	401	682	322	332	253
14	216	193	1610	337	620	989	1050	396	586	278	282	200
15	540	287	1320	336	600	790	1020	1550	524	243	267	985
16	431	980	1190	332	660	677	845	1750	477	227	287	2270
17	319	690	1090	323	782	605	774	1400	462	216	284	4550
18	659	4990	980	321	716	561	731	1380	426	203	370	1840
19	1760	19100	878	324	659	682	981	1060	399	201	434	1000
20	912	9040	813	321	604	603	3350	849	376	192	390	732
21	626	3210	761	309	568	529	3030	721	356	186	339	586
22	503	2340	723	305	527	485	1750	639	338	182	290	498
23	426	1850	692	296	496	450	1310	580	321	182	240	438
24	376	1530	650	277	470	426	1070	553	312	181	132	396
25	336	1190	616	277	450	406	919	949	305	178	80	339
26	301	949	573	265	432	385	808	1380	292	177	89	328
27	277	877	550	272	413	375	744	869	278	174	93	336
28	256	993	531	267	403	361	887	714	309	172	95	330
29	265	834	511	260	---	350	805	623	534	170	96	2880
30	291	781	491	270	---	338	688	557	361	168	97	22100
31	302	---	474	271	---	327	---	517	---	167	98	---
TOTAL	10764	52757	37315	10462	18209	16345	59278	24106	19886	6860	9129	41778
MEAN	347	1759	1204	337	650	527	1976	778	663	221	294	1393
MAX	1760	19100	5030	467	2050	1750	12300	1750	2280	322	772	22100
MIN	144	182	474	260	261	301	320	396	278	167	80	99
CFSM	.55	2.77	1.90	.53	1.02	.83	3.11	1.23	1.04	.35	.46	2.19
IN.	.63	3.09	2.19	.61	1.07	.96	3.47	1.41	1.16	.40	.53	2.45
AC-FT	21350	104600	74010	20750	36120	32420	117600	47810	39440	13610	18110	82870
CAL YR 1985	TOTAL	345720	MEAN	947	MAX	19100	MIN	141	CFSM	1.49	IN.	20.25
WTR YR 1986	TOTAL	306889	MEAN	841	MAX	22100	MIN	80	CFSM	1.32	IN.	17.98
											AC-FT	685700
											AC-FT	608700



## ARKANSAS RIVER BASIN

109

07196000 FLINT CREEK NEAR KANSAS, OK

LOCATION.--Lat 36°11'54", long 94°42'30", in SW 1/4 sec.24, T.20 N., R.24 E., Delaware County, Hydrologic Unit 11110103, at bridge on State Highway 33, 6.0 mi southeast of Kansas, 6.0 mi downstream from Sager Creek, and at mile 2.8.

DRAINAGE AREA.--110 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1955 to September 1976, April 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is 854.59 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good below 4,000 ft<sup>3</sup>/s and poor above. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Small diversion above station for irrigation.

AVERAGE DISCHARGE.--28 years, (water years 1956-76, 80-86), 117 ft<sup>3</sup>/s 14.44 in/yr, 84,770 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,400 ft<sup>3</sup>/s, June 8, 1974, gage height, 19.42 ft; minimum daily discharge, 0.6 ft<sup>3</sup>/s, Oct. 11-13, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft<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)
Nov. 18	1230	4,070	9.28	Sept. 30	0030	*13,300	*12.83
Apr. 8	0800	4,130	9.31				

Minimum daily discharge, 26 ft<sup>3</sup>/s, Oct. 7-8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	164	1060	130	62	66	62	321	104	70	33	30
2	32	145	493	125	69	65	65	234	314	69	48	34
3	31	127	369	121	88	66	77	180	341	65	57	44
4	30	114	314	117	95	66	591	163	233	60	44	51
5	28	106	271	112	87	63	474	150	187	57	40	43
6	27	99	240	109	170	62	383	144	217	55	253	37
7	26	94	216	106	265	61	366	127	407	54	186	34
8	26	88	197	103	226	58	2390	117	594	54	115	31
9	27	84	191	100	200	57	795	108	435	50	95	31
10	28	83	735	98	181	61	492	109	305	55	110	30
11	32	81	1360	96	167	69	381	110	247	54	91	33
12	33	83	748	93	152	349	314	102	211	57	75	35
13	57	81	516	92	138	265	265	96	184	102	66	32
14	313	78	407	91	134	199	261	96	166	84	59	29
15	317	97	352	89	126	170	221	471	150	71	83	808
16	198	116	316	88	125	148	196	335	137	57	127	414
17	153	122	290	86	127	128	185	554	127	51	101	247
18	467	2180	264	89	125	126	179	453	117	48	81	206
19	578	1860	244	83	120	119	202	329	108	47	71	160
20	331	1050	227	81	113	106	373	263	101	44	64	124
21	249	592	211	80	105	96	369	223	95	42	57	101
22	205	440	200	78	105	87	292	195	90	43	52	88
23	176	358	191	76	102	83	254	175	85	42	49	78
24	156	306	180	76	98	79	212	166	84	41	46	67
25	134	268	171	75	95	77	187	218	80	39	44	60
26	118	243	165	73	92	74	171	211	75	38	40	60
27	107	217	161	70	89	71	163	162	72	35	36	71
28	99	197	152	72	84	68	167	144	76	33	37	66
29	124	182	146	71	---	67	143	129	75	32	35	1870
30	184	211	140	69	---	63	130	119	71	31	33	7570
31	175	---	136	66	---	61	---	112	---	30	30	---
TOTAL	4495	9866	10663	2815	3540	3130	10360	6316	5488	1610	2258	12484
MEAN	145	329	344	90.8	126	101	345	204	183	51.9	72.8	416
MAX	578	2180	1360	130	265	349	2390	554	594	102	253	7570
MIN	26	78	136	66	62	57	62	96	71	30	30	29
AC-FT	8920	19570	21150	5580	7020	6210	20550	12530	10890	3190	4480	24760

CAL YR 1985 TOTAL 86653 MEAN 237 MAX 3570 MIN 26 AC-FT 171900  
WTR YR 1986 TOTAL 73025 MEAN 200 MAX 7570 MIN 26 AC-FT 144800

## 07196500 ILLINOIS RIVER NEAR TAHLEQUAH, OK

LOCATION.--Lat 35°55'17", long 94°55'15", in SE 1/4 sec.26, T.17 N., R.22 E., Cherokee County, Hydrologic Unit 11110103, near center of channel on downstream side of pier of bridge, 0.2 mi downstream from U.S. Highway 62, 2.2 mi northeast of Tahlequah, 6.5 mi upstream from Baron Fork, and at mile 55.8.

DRAINAGE AREA.--959 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1935 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 664.14 ft, U.S. Army Corps of Engineers datum. Prior to Feb. 23, 1939, nonrecording gage.

REMARKS.--Estimated daily discharges: Oct. 19-20, Dec. 20 to Jan. 30, and Feb. 21-26. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--51 years, 885 ft<sup>3</sup>/s, 12.53 in/yr, 641,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 150,000 ft<sup>3</sup>/s, May 10, 1950, gage height, 27.94 ft, from rating curve extended above 77,000 ft<sup>3</sup>/s, on basis of slope-area measurement of peak flow; minimum daily, 0.1 ft<sup>3</sup>/s, Oct. 10-14, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of January 1916 reached a stage of about 26 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 35,200 ft<sup>3</sup>/s, Sept. 30, stage rising, peak occurred Oct. 1, 1986; peak discharges greater than base discharge of 9,000 ft<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)
Nov. 20	1500	*32,500	*17.88	Apr. 9	1700	22,100	15.73

Minimum discharge, 160 ft<sup>3</sup>/s, Aug. 31 and Sept. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	246	856	2200	700	404	627	530	1170	1040	570	203	162
2	240	792	3230	670	405	598	523	1390	1050	499	205	169
3	238	728	2450	650	422	565	540	1390	1160	466	220	175
4	234	662	1770	630	526	545	1160	1200	1370	449	224	185
5	230	599	1480	610	534	527	6030	1090	1290	422	221	191
6	225	544	1270	590	669	511	6390	1010	1270	396	256	196
7	221	506	1100	570	1200	495	4030	946	1410	373	502	207
8	216	471	1010	560	2380	484	4640	887	2030	352	1030	208
9	214	453	925	540	1870	486	15800	830	3130	337	761	205
10	216	442	1670	520	1640	487	7250	818	3030	325	658	200
11	223	408	5730	510	1470	478	3540	876	2030	315	728	213
12	225	396	7740	490	1320	804	2570	815	1600	310	901	209
13	280	395	4730	480	1220	2390	2040	764	1390	333	675	204
14	906	392	2980	470	1160	2130	1790	739	1180	466	528	264
15	1460	426	2190	460	1130	1610	1650	1580	1040	448	504	302
16	1380	519	1790	455	1140	1360	1550	2960	932	392	554	1930
17	1200	1090	1600	450	1150	1180	1380	3840	849	354	513	3030
18	1280	2680	1460	445	1180	1090	1330	3840	798	324	479	4960
19	2860	12900	1350	440	1140	1010	1340	2900	739	304	447	2440
20	2980	27700	1260	435	1120	1020	1930	2100	683	288	531	1590
21	2100	12600	1200	430	1020	976	4780	1680	638	275	517	1200
22	1590	4670	1140	425	960	885	3950	1430	597	262	471	955
23	1300	3190	1090	420	892	814	2620	1260	571	256	422	788
24	1090	2390	1030	415	836	759	2020	1770	540	249	373	670
25	928	1930	980	410	762	716	1700	1530	512	243	322	584
26	801	1580	940	410	720	675	1490	2000	496	239	243	524
27	698	1300	900	405	687	636	1350	2140	472	233	196	522
28	626	1140	860	400	648	610	1260	1600	472	227	176	477
29	644	1130	820	400	---	585	1300	1340	452	220	169	1080
30	770	1020	760	405	---	561	1230	1170	578	213	164	16900
31	861	---	730	409	---	541	---	1070	---	206	162	---
TOTAL	26482	83909	58385	15204	28605	26155	87713	48135	33349	10346	13355	40740
MEAN	854	2797	1883	490	1022	844	2924	1553	1112	334	431	1358
MAX	2980	27700	7740	700	2380	2390	15800	3840	3130	570	1030	16900
MIN	214	392	730	400	404	478	523	739	452	206	162	162
AC-FT	52530	166400	115800	30160	56740	51880	174000	95480	66150	20520	26490	80810

CAL YR 1985 TOTAL 602714 MEAN 1651 MAX 27700 MIN 184 AC-FT 1195000  
WTR YR 1986 TOTAL 472378 MEAN 1294 MAX 27700 MIN 162 AC-FT 937000

## ARKANSAS RIVER BASIN

111

07197000 BARON FORK AT ELTON, OK

LOCATION.--Lat 35°55'16", long 94°50'18", in SE 1/4 sec.27, T.17 N., R.23 E., Cherokee County, Hydrologic Unit 11110103, on downstream side of second pier from left bank of bridge on State Highway 51, 0.4 mi southeast of Eldon, 6.0 mi downstream from Tyner Creek, and at mile 8.8.

DRAINAGE AREA.--307 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1948 to current year. Prior to October 1970 published as Barren Fork at Eldon.

GAGE.--Water-stage recorder. Datum of gage is 701.14 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Dec. 14, 1948, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--38 years, 294 ft<sup>3</sup>/s, 12.99 in/yr, 213,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,600 ft<sup>3</sup>/s, Apr. 3, 1957, gage height, 20.33 ft, maximum gage height, 23.23 ft, Nov. 19, 1985; minimum, 1.7 ft<sup>3</sup>/s, Oct. 25, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 15, 1945, reached a stage of 23.8 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft<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. 19	0430	6,030	11.74	Apr. 5	0145	7,160	12.53
Nov. 19	0615	*34,300	*23.23	Apr. 8	1630	7,160	12.53

Minimum daily discharge, 21 ft<sup>3</sup>/s, Oct. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	206	1180	242	120	183	169	457	354	143	46	67
2	37	197	1130	223	119	176	173	623	350	145	43	66
3	34	186	887	224	120	168	224	443	338	139	44	67
4	31	173	765	216	127	163	2950	375	320	131	44	68
5	28	161	668	203	144	157	4150	334	307	124	42	69
6	26	152	587	200	393	152	2270	310	644	116	58	70
7	24	145	515	192	982	148	2060	285	850	111	186	68
8	22	137	463	183	685	143	3990	262	1950	107	158	64
9	21	131	432	173	588	139	2720	240	2100	103	156	61
10	22	127	2070	171	518	138	1630	234	1180	101	1320	59
11	25	121	3880	166	464	144	1160	299	1130	97	729	62
12	26	120	2600	154	416	881	910	261	862	95	373	312
13	35	121	1690	159	376	902	751	227	640	99	255	196
14	122	119	1210	145	354	686	756	212	509	119	192	131
15	284	133	965	152	348	569	711	800	433	112	167	120
16	289	853	829	147	347	476	574	1010	374	105	193	212
17	214	552	735	145	370	411	496	1350	358	100	223	339
18	635	4670	648	145	359	384	454	1530	323	95	179	381
19	3190	18000	576	145	337	413	527	1120	287	91	144	295
20	1150	5300	517	145	315	387	2150	851	258	87	126	215
21	769	2540	468	145	293	337	1890	692	233	84	111	166
22	583	1600	441	140	272	307	1250	581	216	79	102	140
23	460	1210	416	137	252	286	941	490	204	76	98	123
24	377	957	385	134	238	264	760	1360	191	72	93	109
25	319	798	353	131	224	246	632	1070	178	69	87	100
26	270	692	321	128	214	229	534	962	165	66	83	95
27	235	696	307	126	204	214	466	737	157	64	82	102
28	213	747	280	124	192	203	537	604	161	59	82	100
29	216	610	280	123	---	192	481	504	156	55	75	467
30	226	546	258	121	---	183	400	430	148	52	71	6200
31	216	---	254	121	---	172	---	382	---	49	68	---
TOTAL	10141	42000	26110	4960	9371	9453	36716	19035	15376	2945	5630	10524
MEAN	327	1400	842	160	335	305	1224	614	513	95.0	182	351
MAX	3190	18000	3880	242	982	902	4150	1530	2100	145	1320	6200
MIN	21	119	254	121	119	138	169	212	148	49	42	59
AC-FT	20110	83310	51790	9840	18590	18750	72830	37760	30500	5840	11170	20870

CAL YR 1985 TOTAL 216528 MEAN 593 MAX 18000 MIN 18 AC-FT 429500  
WTR YR 1986 TOTAL 192261 MEAN 527 MAX 18000 MIN 21 AC-FT 381300

## ARKANSAS RIVER BASIN

## 07197500 TENKILLER FERRY LAKE NEAR GORE, OK

LOCATION.--Lat 35°35'43", long 95°02'57", in SE 1/4 SW 1/4 sec.14, T.13 N., R.21 E., Sequoyah County, Hydrologic Unit 11110103, at gage tower on right bank, 0.6 mi upstream from Tenkiller Ferry Dam on Illinois River, 6.0 mi northeast of Gore, and at mile 12.8.

DRAINAGE AREA.--1,610 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1952 to current year. Prior to October 1970, published as Tenkiller Ferry Reservoir near Gore.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929. Prior to Apr. 5, 1953, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earth dam. Spillway consists of 590 ft concrete modified ogee-type weir in right abutment controlled by ten taintor gates. Outlet works consist of a 19-foot diameter tunnel in right abutment controlled by two vertical lift gates. A similar tunnel conducts water to two hydroelectric turbines. Closure was made for diversion in July 1950 and regulated storage began in July 1952; conservation pool was first filled Apr. 9, 1953. Capacity, 1,231,000 acre-ft at elevation 667.0 ft, flood-control pool, 791,900 acre-ft at elevation, 642.0 ft, spillway crest, 628,700 acre-ft at elevation 630.0 ft, maximum power pool, and 283,100 acre-ft at elevation 594.5 ft, conservation and minimum power pool. Figures given herein represent total contents. Reservoir is used for flood control and for power development.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,218,000 acre-ft, June 5, 1957, elevation, 666.36 ft; minimum since conservation pool was first filled, 305,700 acre-ft, Oct. 21, 1954, elevation, 597.50 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 858,400 acre-ft, Nov. 22, elevation 646.41 ft; minimum, 634,700 acre-ft, Aug. 5, elevation 630.49 ft.

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

630	628,700	642	791,900
634	680,300	646	852,000
638	734,700	650	915,600

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	655100	687200	817500	678100	642200	652000	653100	677800	691400	680000	637100	655000
2	655300	685500	818700	675200	643200	653600	650700	675300	691000	677900	636800	654000
3	655400	683800	817300	672300	644100	652700	649400	672000	691700	675300	636800	654600
4	655500	681200	814000	671400	645500	651700	666500	668100	692600	674300	635000	654400
5	655400	681600	809500	670100	647400	650700	684200	664200	695900	673100	634700	654000
6	655400	678100	798300	668400	650400	648500	701500	659900	702500	672000	635200	654000
7	655100	675500	781800	666200	654600	645200	710200	656300	705600	669200	636700	654200
8	655400	672600	764900	663800	662000	644800	716200	654200	708800	666200	638400	654100
9	655700	671900	754300	661300	668200	644400	737200	651900	713600	663000	642400	653400
10	656500	671300	758900	658800	669300	646800	746100	652300	716400	660300	645700	652900
11	656700	668400	766900	656500	669700	649500	739700	651600	716400	656700	648600	656200
12	657000	665800	772500	653800	670100	654600	732300	650300	715000	657200	650700	655800
13	658800	663700	769300	651200	669200	662100	722600	649800	712200	657800	652400	656200
14	663400	664300	759400	651700	669200	667700	713700	652500	708600	655000	653200	656600
15	664400	664200	747900	649100	670500	673400	705500	659600	704300	653300	655100	657400
16	664800	664700	740300	647200	671900	675300	701600	665000	700900	652000	656500	660100
17	665600	666700	736800	645600	671800	677700	697600	676800	698400	651600	657800	665100
18	677700	689300	732100	647000	670700	681200	695500	687100	696500	651200	657900	674100
19	687900	760000	726800	645600	669300	681200	696300	693800	696700	651700	658200	675800
20	695000	820000	723200	646400	667200	681000	700500	694300	695800	652100	658300	677500
21	697900	853900	720100	646100	665800	679000	708600	692900	696700	651700	658300	678100
22	699200	858000	716900	645100	666300	677700	709000	690500	697200	651200	658200	676800
23	699600	854700	713600	644300	665800	675800	706800	687800	695800	650600	658200	673600
24	699400	849100	710100	643800	662700	672800	697200	693000	693700	649800	658000	670100
25	697900	842100	706100	644900	658900	671400	691600	694400	691200	647800	657600	666300
26	697300	823800	695400	646000	654200	668400	688400	694600	688700	647900	657100	662600
27	695900	828100	698000	644800	650800	665000	686500	694600	686100	648100	657000	663400
28	695200	825900	693400	642600	650300	661000	683300	693100	685500	646000	655900	663700
29	694700	821900	688900	640800	---	660500	679900	692900	684800	643800	654900	663300
30	691300	817500	684400	640900	---	660300	676400	692100	682400	641400	654800	717900
31	688400	---	681000	640900	---	656500	---	692200	---	638800	654900	---
MAX	699600	858000	818700	678100	671900	681200	746100	694600	716400	680000	658300	717900
MIN	655100	663700	681000	640800	642200	644400	649400	649800	682400	638800	634700	652900
(†)	634.62	643.74	634.05	630.99	631.71	632.18	633.70	634.91	634.16	630.82	632.06	636.79
(††)	+33,300	+129,100	-136,500	-40,100	+9,400	+6,200	+19,900	+15,800	-9,800	-43,600	+16,100	+63,000
CAL YR 1985	MAX	858000	MIN	587600	(††)	-95,800						
WTR YR 1986	MAX	858000	MIN	634700	(††)	+62,800						

(†) ELEVATION, IN FEET, AT END OF MONTH  
(††) CHANGE IN CONTENTS, IN ACRE-Feet

## 113

LOCATION.--Lat 35°34'23", long 95°04'07", in NE 1/4 SW 1/4 sec.27, T.13 N., R.21 E., Sequoyah County, Hydrologic Unit 11110104, on right bank 4.5 mi downstream from Tenkiller Ferry Dam, 4.5 mi northeast of Gore, and at mile 8.5.

DRAINAGE AREA.--1,626 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1924 to April 1926, April 1939 to current year. Monthly discharge only for some periods, published in WSP 1311.

GAGE.--Water-stage recorder. Datum of gage is 473.00 ft, National Geodetic Vertical Datum of 1929.  
See WSP 1921 for history of changes prior to Feb. 19, 1952.

REMARKS.--No estimated daily discharges. Records fair. Except for 16 mi<sup>2</sup> intervening area, flow completely regulated since July 1952 by Tenkiller Ferry Lake (station 07197500).

COOPERATION.--Gage-height record and 8 discharge measurements furnished by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--48 years (water years 1925, 1940-86), 1,510 ft<sup>3</sup>/s, 1,094,000 acre-ft/yr adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 180,000 ft<sup>3</sup>/s May 11, 1950, gage height, 29.6 ft, from floodmark, present site and datum, from rating curve extended above 42,000 ft<sup>3</sup>/s by velocity-area studies; minimum discharge, 2.0 ft<sup>3</sup>/s, Sept. 16, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,700 ft<sup>3</sup>/s, Dec. 6, gage height, 11.65 ft; minimum daily discharge, 11 ft<sup>3</sup>/s, Mar. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	125	2070	5850	2770	59	66	3470	2220	2370	2140	1390	182
2	120	2100	5750	2790	55	56	3100	4200	2520	2070	269	777
3	131	2160	5730	2660	540	1460	2960	4270	1910	1920	138	690
4	127	2480	5730	1690	236	1390	2710	4270	1670	1190	1180	525
5	123	1290	5710	1650	178	1440	3210	4270	1770	1090	210	567
6	120	2260	8500	2020	237	2090	3280	4260	1840	1320	133	139
7	123	2320	11600	2100	638	2470	4630	3930	2310	2020	112	150
8	133	2270	11400	2160	102	917	6010	2740	4340	1970	142	186
9	122	1110	8780	2170	89	884	7750	2800	4210	2130	143	598
10	125	1150	5980	2170	2180	27	9120	2250	4240	1990	138	622
11	127	2190	9010	2100	2250	11	10000	2280	4220	2240	136	706
12	129	2280	11500	2190	2220	85	8740	2260	4150	200	117	759
13	120	1840	11500	2110	2180	65	8630	1720	4160	134	115	168
14	134	1020	11400	621	2090	1010	8570	1400	4140	2060	278	159
15	1340	1140	11400	2010	1100	65	7440	1640	4130	1480	262	684
16	1600	1210	8800	1820	1080	1450	5180	2390	3530	1240	164	580
17	1180	1070	5720	1770	2060	872	4540	2730	2770	724	155	647
18	1430	1330	5720	138	2390	697	4560	2410	2570	543	751	647
19	1020	1740	5700	109	2430	2220	4630	2090	1050	124	625	2370
20	2190	1310	4870	1510	2570	2270	4610	4370	1590	138	665	1340
21	2170	2610	4090	972	2520	2950	4480	4350	787	506	686	1320
22	2120	6090	4070	1200	1290	2490	5360	4330	750	780	699	2110
23	2020	8060	3970	939	1350	2710	7100	4300	2280	667	541	2880
24	2020	7900	3860	900	2960	3160	8760	3410	2310	708	530	2980
25	2040	7840	3850	76	3100	2320	6760	3040	2020	1400	702	2970
26	2040	7860	3910	56	3270	3250	4400	4220	2250	157	618	2960
27	2040	5910	3950	1030	3410	3180	4400	4250	2240	135	610	765
28	2040	3910	3970	1590	1180	3430	4390	4330	1110	1380	635	600
29	1950	4750	3960	1590	---	1590	4380	3150	1170	1380	657	2790
30	2570	5720	3960	648	---	1370	4370	2670	1450	1470	148	4060
31	3410	---	3480	362	---	3200	---	2370	---	1560	146	---
TOTAL	34939	94990	203720	45921	43764	49195	167540	98920	75857	36866	13095	35931
MEAN	1127	3166	6572	1481	1563	1587	5585	3191	2529	1189	422	1198
MAX	3410	8060	11600	2790	3410	3430	10000	4370	4340	2240	1390	4060
MIN	120	1020	3480	56	55	11	2710	1400	750	124	112	1



07198000 ILLINOIS RIVER NEAR GORE, OK--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1948, 1952, 1954 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1947 to September 1948, October 1953 to September 1963.

WATER TEMPERATURE: October 1947 to September 1948, October 1953 to September 1963.

REMARKS.--Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)
OCT										
22...	1300	1028	80020	6.03	2170	*199	7.00	22.0	21.5	5.0
NOV										
20...	1500	1028	80020	5.89	1990	*184	7.20	8.5	14.5	3.3
DEC										
30...	1600	1028	80020	7.32	3950	*177	7.00	14.5	10.0	9.0
JAN										
16...	1415	1028	80020	5.97	2670	169	7.90	16.5	14.0	10
FEB										
13...	1130	1028	80020	7.20	3830	155	7.80	-1.5	5.0	6.3
MAR										
05...	1230	1028	80020	5.76	1990	192	8.10	19.5	13.0	5.0
APR										
15...	1230	1028	80020	9.85	8580	*187	7.80	13.5	13.5	4.0
MAY										
28...	1030	1028	80020	7.32	4340	*164	7.60	24.5	17.5	4.5
JUN										
13...	1000	1028	80020	7.30	4160	203	7.70	30.5	20.0	5.5
JUL										
09...	0940	1028	80020	2.20	52	292	6.70	29.0	27.0	2.0
AUG										
19...	0940	1028	80020	1.94	30	273	7.30	31.0	22.0	--
SEP										
18...	1100	1028	80020	1.92	30	288	7.30	26.0	21.5	2.2

DATE	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM
OCT 22...	760	9.3	106	86	3	30	2.6	4.7	10
NOV 20...	770	10.9	106	77	8	28	1.8	5.2	12
DEC 30...	760	11.3	100	77	9	28	1.6	3.6	9
JAN 16...	760	7.2	70	74	5	27	1.6	4.2	11
FEB 13...	770	8.9	69	74	0	27	1.6	3.8	10
MAR 05...	760	10.7	102	74	2	27	1.7	4.1	10
APR 15...	770	12.3	117	77	3	28	1.6	3.9	10
MAY 28...	760	11.8	124	79	5	29	1.7	3.8	9
JUN 13...	760	10.0	110	84	2	31	1.6	3.9	9
JUL 09...	770	7.6	95	94	16	33	2.7	19	30
AUG 19...	760	8.5	98	97	9	34	2.9	12	21
SEP 18...	760	9.1	103	110	0	38	2.5	16	24

\* SPECIFIC CONDUCTANCE, LAB (US/CM)



## ARKANSAS RIVER BASIN

115

07198000 ILLINOIS RIVER NEAR GORE, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HC03)	CAR- BONATE IT-FLD (MG/L AS C03)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
OCT 22...	0.2	2.5	101	0	83	16	8.8	5.6	110
NOV 20...	0.3	2.3	84	0	69	8.4	9.1	9.4	98
DEC 30...	0.2	2.4	83	0	68	13	9.8	5.5	41
JAN 16...	0.2	2.5	84	0	69	1.7	9.6	7.7	102
FEB 13...	0.2	2.4	90	0	74	2.3	9.2	5.6	95
MAR 05...	0.2	2.6	88	0	72	1.1	9.6	6.3	96
APR 15...	0.2	2.3	90	0	74	2.3	9.9	6.6	104
MAY 28...	0.2	2.3	90	0	74	3.6	9.6	6.3	112
JUN 13...	0.2	2.3	100	0	82	3.2	12	6.2	116
JUL 09...	0.9	2.4	95	0	78	30	9.8	36	164
AUG 19...	0.6	2.7	107	0	88	8.5	7.0	25	146
SEP 18...	0.7	2.7	90	0	110	7.2	9.4	33	224

## 07228500 CANADIAN RIVER AT BRIDGEPORT, OK

LOCATION.--Lat 35°32'37", long 98°19'03", SE 1/4 NW 1/4 sec.1, T.12 N., R.11 W., Caddo County, Hydrologic Unit 11090202, on downstream side of pier near center of bridge on U.S. Highway 281, 3.3 mi east of Bridgeport, 1.6 mi downstream from Lumpmouth Creek, and at mile 263.3.

DRAINAGE AREA.--25,276 mi<sup>2</sup>, of which 4,801 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1944 to September 1964; October 1969 to current year.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,360.00 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 1, 1947, at site 3.8 mi upstream at datum 24.25 ft higher. Oct. 1, 1947 to Sept. 30, 1948, nonrecording gage and Oct. 1, 1948 to September 1964, Oct. 1, 1969 to Dec. 17, 1980 at site 4.0 mi upstream and at datum 24.25 ft higher.

REMARKS.--Estimated daily discharges: Oct. 2, 6, 11-13, 26-27, Nov. 3-4, 16-19, 23-24, 27, 30, Dec. 1, 7, 10-21, 28-31, Jan. 1-4, 8-10, 12, 14, 20-21, 26, Feb. 1-2, 8-9, 19, 28, Mar. 2, 12-14, 19, 23, 30, Apr. 3, 5-7, 19, 24, May 4, 11, 18, 24-25, June 2-3, 8-9, 13-14, 23-24, 28-30, July 1-13, 18-22, 26, 30-31, Aug. 1-2, 4-8, 13-14, 16-21, 23, 30, and Sept. 6-7, 15, 20-21. Records poor. Occasional slight regulation by dams in New Mexico and Texas since 1964.

AVERAGE DISCHARGE.--37 years (water years 1945-64, 1970-86), 363 ft<sup>3</sup>/s, 263,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 150,000 ft<sup>3</sup>/s, June 23, 1948, gage height, 14.60 ft, from floodmarks, from rating curve extended above 50,000 ft<sup>3</sup>/s; no flow at times in 1946, 1951-56, 1964, 1970, 1984, and 1985.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1914 reached a stage of about 19.4 ft, a higher stage probably occurred during flood in October 1904.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft<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. 18	--	11,270	13.35	Sept. 29	--	*26,600	*15.16

Minimum daily discharge, 4.4 ft<sup>3</sup>/s, Aug. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	120	210	143	179	192	110	65	77	56	17	9.8
2	83	115	177	141	172	182	144	55	76	59	10	9.8
3	80	110	163	140	170	177	1200	40	400	55	6.2	13
4	70	100	156	139	170	177	207	30	2200	52	6.2	30
5	60	95	150	144	177	177	165	16	1450	50	8.0	36
6	63	90	132	150	177	170	145	9.1	1160	60	16	57
7	65	90	140	144	177	170	135	13	628	200	9.0	47
8	65	90	150	141	180	170	126	13	560	70	6.5	40
9	70	85	222	136	188	163	115	65	540	60	5.5	65
10	80	80	160	134	185	163	100	1300	1340	50	5.5	36
11	95	105	150	144	185	163	85	900	1210	45	5.1	36
12	75	110	143	150	185	160	80	614	1050	110	4.5	36
13	65	100	139	163	192	158	80	390	1000	70	4.4	33
14	2680	95	135	190	192	150	80	317	3100	36	80	33
15	1030	1620	130	163	192	156	77	222	2150	13	1450	400
16	724	450	130	177	192	163	77	200	1160	13	800	207
17	536	140	126	170	192	163	77	1030	230	9.8	500	85
18	9520	130	123	170	192	156	73	5600	126	10	300	65
19	737	110	121	163	199	210	160	1250	105	11	230	50
20	177	95	150	161	192	156	95	762	80	11	190	45
21	150	105	200	160	200	144	90	587	65	11	150	38
22	144	150	255	156	200	144	77	500	77	12	132	33
23	144	200	185	150	200	180	65	156	90	13	100	25
24	156	280	177	156	200	156	58	150	470	9.8	73	25
25	126	263	163	156	200	132	46	130	150	9.6	25	25
26	120	263	156	153	200	120	43	317	65	8.8	9.4	25
27	590	250	150	156	207	110	77	120	65	8.1	9.1	25
28	272	222	148	163	200	110	255	105	64	7.5	9.1	25
29	126	222	146	170	---	110	73	100	62	6.4	8.7	26400
30	126	240	145	170	---	111	70	85	59	6.2	20	7160
31	120	---	142	170	---	110	---	80	---	6.2	9.1	---
TOTAL	18434	6125	4874	4823	5295	4803	4185	15221.1	19809	1139.4	4199.3	35114.6
MEAN	595	204	157	156	189	155	139	491	660	36.8	135	1170
MAX	9520	1620	255	190	207	210	1200	5600	3100	200	1450	26400
MIN	60	80	121	134	170	110	43	9.1	59	6.2	4.4	9.8
AC-FT	36560	12150	9670	9570	10500	9530	8300	30190	39290	2260	8330	69650

CAL YR 1985 TOTAL 53573.2 MEAN 147 MAX 9520 MIN .00 AC-FT 106300  
WTR YR 1986 TOTAL 124022.2 MEAN 340 MAX 26400 MIN 4.4 AC-FT 246000

## ARKANSAS RIVER BASIN

117

07228500 CANADIAN RIVER AT BRIDGEPORT, OK--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949-61, 1964, 1970 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1948 to September 1960, October 1969 to April 1982.

WATER TEMPERATURE: October 1948 to September 1960, October 1969 to April 1982.

REMARKS: Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	
OCT 28...	1600	1028	80020	9.91	272	2280	8.10	18.0	20.0	769	9.2	101	
NOV 22...	1200	1028	80020	9.80	148	2290	8.00	8.0	6.0	726	12.9	110	
DEC 09...	1430	1028	80020	10.22	234	2220	7.90	13.0	7.0	722	11.5	101	
JAN 16...	1140	1028	80020	10.10	185	2200	8.00	14.5	7.0	724	11.6	101	
FEB 27...	1525	1028	80020	10.09	203	2080	8.25	16.0	15.0	725	9.6	101	
MAR 24...	1230	1028	80020	10.08	147	2840	8.10	24.0	20.0	733	8.5	98	
APR 28...	1300	1028	80020	10.25	251	1070	7.45	24.0	23.0	724	7.8	96	
MAY 23...	1210	1028	80020	10.16	171	2140	7.90	19.5	23.0	716	8.2	103	
JUN 25...	1230	1028	80020	10.15	157	1520	7.85	31.5	30.0	730	7.6	106	
JUL 14...	1200	1028	80020	9.58	32	1570	8.25	28.0	25.0	730	8.5	108	
AUG 22...	1215	1028	80020	10.13	134	1730	8.25	29.0	28.5	730	7.1	96	
SEP 09...	1330	1028	80020	9.92	63	1880	8.20	25.0	26.0	720	6.7	88	
DATE		HARD-NESS (MG/L AS CAC03)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE IT-FLD (MG/L AS HCO3)	CAR-BONATE IT-FLD (MG/L AS CO3)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)
OCT 28...	550	--		140	47	260	--	5	--	--	--	--	--
NOV 22...	590	380		150	52	250	48	5	5.2	--	--	--	4.2
DEC 09...	660	470		170	56	280	--	5	--	232	0	190	4.6
JAN 16...	590	360		150	51	240	47	4	4.7	278	0	228	4.4
FEB 27...	560	370		140	50	230	--	4	--	224	0	184	2.0
MAR 24...	670	500		170	60	270	46	5	5.6	208	0	170	2.6
APR 28...	360	260		100	27	71	--	2	--	123	0	101	6.9
MAY 23...	570	410		140	52	220	46	4	7.2	189	0	155	3.8
JUN 25...	510	380		140	38	120	--	2	--	156	0	128	3.5
JUL 14...	500	360		140	37	130	36	3	6.8	180	0	148	1.6
AUG 22...	460	340		120	38	180	--	4	--	146	0	120	1.3
SEP 09...	530	400		140	43	220	47	4	6.0	154	0	126	1.5

## ARKANSAS RIVER BASIN

07228500 CANADIAN RIVER AT BRIDGEPORT, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
OCT 28...	--	--	18	--	--	--	--	0.080	0.130	0.58	0.020	0.020
NOV 22...	390	380	18	1410	1400	1.9	563	0.390	0.350	1.5	0.010	0.010
DEC 09...	--	--	21	--	--	--	--	0.480	0.460	2.0	0.020	0.020
JAN 16...	410	370	18	1400	1400	1.9	699	0.580	0.610	--	0.020	0.020
FEB 27...	--	--	14	--	--	--	--	0.190	0.130	--	0.010	0.010
MAR 24...	480	410	15	1540	1500	2.1	611	--	--	--	0.010	<0.010
APR 28...	--	--	12	--	--	--	--	0.440	0.460	--	0.060	0.060
MAY 23...	420	310	15	1390	1300	1.9	642	--	0.110	--	0.010	0.010
JUN 25...	--	--	14	--	--	--	--	0.380	0.340	--	0.020	0.020
JUL 14...	380	200	16	1020	1000	1.4	89	--	--	--	<0.010	<0.010
AUG 22...	--	--	13	--	--	--	--	--	--	--	<0.010	<0.010
SEP 09...	400	350	14	1400	1300	1.9	239	--	--	--	<0.010	0.010
DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS- PENDED TOTAL (UG/L AS AS)	ARSENIC DIS- SOLVED (UG/L AS AS)
OCT 28...	0.07	0.100	0.150	0.060	0.060	0.08	0.070	0.070	0.21	5	0	5
NOV 22...	0.03	0.400	0.360	0.140	0.120	0.15	0.070	0.070	0.21	4	0	4
DEC 09...	0.07	0.500	0.480	0.130	0.120	0.15	0.060	0.050	0.15	3	0	3
JAN 16...	0.07	0.600	0.630	0.080	0.070	0.09	0.080	0.060	0.18	3	--	3
FEB 27...	0.03	0.200	0.140	0.050	0.040	0.05	0.050	0.030	0.09	4	--	4
MAR 24...	--	<0.100	<0.100	0.060	0.080	0.10	0.070	<0.010	--	4	--	3
APR 28...	0.20	0.500	0.520	0.440	0.390	0.50	0.090	0.060	0.18	4	--	3
MAY 23...	0.03	<0.100	0.120	0.100	0.140	0.18	0.070	0.030	0.09	5	--	4
JUN 25...	0.07	0.400	0.360	0.070	0.050	0.06	0.090	0.050	0.15	6	--	6
JUL 14...	--	<0.100	<0.100	0.100	0.060	0.08	0.110	0.030	0.09	6	--	5
AUG 22...	--	<0.100	<0.100	0.060	0.050	0.06	0.060	0.020	0.06	4	--	4
SEP 09...	0.03	<0.100	<0.100	0.050	0.210	0.27	0.080	0.040	0.12	5	--	4

## ARKANSAS RIVER BASIN

119

07228500 CANADIAN RIVER AT BRIDGEPORT, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CADMIUM SUS- PENDE RECOV- ERABLE (UG/L AS CD)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, DIS- SOLVED (UG/L AS PB)
OCT 28...	190	2	1	0	1	10	<10	<3	10	<3	2	<10
NOV 22...	190	<0.5	<1	--	<1	11	<10	<3	<10	7	4	<10
DEC 09...	200	<0.5	1	--	<1	--	<10	<3	20	250	6	<10
JAN 16...	140	<0.5	<1	--	<1	12	10	<3	20	<3	<1	<10
FEB 27...	120	<0.5	3	--	1	3	<10	<3	10	6	2	<10
MAR 24...	120	<2	<1	--	<3	10	<10	<9	<30	<9	<1	<30
APR 28...	85	<0.5	<1	--	<1	9	<10	<3	<10	7	6	<10
MAY 23...	75	<0.5	<1	--	1	2	<10	<3	20	5	5	<10
JUN 25...	170	<0.5	<1	--	<1	17	<10	<3	<10	27	<5	<10
JUL 14...	160	<0.5	<1	--	2	9	<10	<3	10	10	<5	<10
AUG 22...	190	<0.5	<1	--	<1	3	<10	<3	<10	13	<5	<10
SEP 09...	170	<0.5	<1	--	2	8	<10	<3	<10	9	<5	<10

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	PCB, DIS- SOLVED (UG/L)	PCB, TOTAL (UG/L)	PCN DISSOLV (UG/L)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L)
OCT 28...	71	12	<0.10	<0.1	<10	1800	13	15	<0.1	<0.1	<0.10	<0.10
NOV 22...	65	16	<0.10	<0.1	<10	2000	6	10	--	--	--	--
DEC 09...	73	28	<0.10	<0.1	<10	2200	9	7	--	--	--	--
JAN 16...	65	11	<0.10	<0.1	<10	2100	7	8	--	--	--	--
FEB 27...	62	15	<0.10	<0.1	<10	2000	9	12	--	--	--	--
MAR 24...	78	11	<0.10	<0.1	<30	2300	18	18	<0.1	<0.1	<0.10	<0.10
APR 28...	29	16	<0.10	<0.1	<10	1000	<6	24	--	--	--	--
MAY 23...	64	9	0.10	<0.1	<10	1900	13	19	--	--	--	--
JUN 25...	39	4	0.20	<0.1	<10	1600	15	14	--	--	--	--
JUL 14...	47	6	<1.0	<0.1	<10	1500	19	28	<0.1	<0.1	<0.10	<0.10
AUG 22...	47	7	<0.10	<0.1	<10	1600	15	16	--	--	--	--
SEP 09...	60	7	<0.10	<0.1	<10	1700	12	32	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[illegible]



07228500 CANADIAN RIVER AT BRIDGEPORT, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[illegible]

## 07229200 CANADIAN RIVER AT PURCELL, OK

LOCATION.--Lat 35°00'50", long 97°20'50", in NW 1/4 sec.7, T.6 N., R.1 W., Cleveland County, Hydrologic Unit 11090202, near left bank on downstream side of pier of U.S. Highway 77, 0.5 mi east of Purcell, 1.0 mi upstream from Walnut Creek, and at mile 184.9.

DRAINAGE AREA.--25,939 mi<sup>2</sup>, of which 4,801 mi<sup>2</sup> probably is noncontributing.

PERIOD OF RECORD.--October 1959 to June 1961, October 1979 to September 1983, October 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,017.14 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharge: Oct. 1-31, Dec. 15-17, Jan. 18-20, July 17-31, and Aug. 2-4, 30, 31. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--6 years (water years 1960, 1980-83, 1986), 624 ft<sup>3</sup>/s, 452,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,500 ft<sup>3</sup>/s, May 19, 1982, gage height, 14.50 ft, no flow at times in 1980.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1904 reached a stage of 14.18 ft and flood in 1914 reached a stage of 12.98 ft, from information by the Atchison, Topeka, and Santa Fe Railway Co.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base discharge of 8,000 ft<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)
May 15	0830	16,000	9.56	Sept. 30	1300	*20,000	*10.14
May 17	2200	16,900	9.67				

Minimum daily discharge, 46 ft<sup>3</sup>/s, July 26, 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	500	188	301	288	217	227	257	338	431	154	126	72
2	400	181	269	290	225	229	291	233	498	144	59	103
3	300	172	176	283	237	220	741	177	671	151	52	92
4	250	162	238	277	241	213	1330	145	1950	135	50	97
5	190	159	258	266	232	221	473	128	1230	116	86	141
6	150	156	240	270	255	226	397	116	822	103	83	187
7	130	151	296	264	263	217	365	102	838	88	114	132
8	110	150	260	251	259	212	292	96	902	82	95	94
9	100	150	242	248	257	218	227	151	652	74	87	87
10	90	146	276	245	255	228	200	635	603	172	1120	76
11	110	146	384	231	250	542	198	1200	1420	308	345	342
12	300	146	371	213	250	650	214	891	489	229	135	238
13	1000	183	375	200	243	296	204	410	342	136	122	169
14	1400	570	325	212	233	214	173	824	311	114	90	159
15	2000	1350	300	221	223	221	158	12100	2020	114	70	209
16	1000	1100	290	254	228	273	150	2460	2970	83	74	193
17	800	415	280	279	225	273	145	10900	2540	62	315	155
18	3500	562	277	275	253	450	156	6650	1030	54	220	477
19	1500	515	277	273	426	381	203	2160	658	52	275	312
20	700	343	277	270	327	333	325	1120	512	50	189	359
21	400	375	285	268	279	295	268	937	465	49	165	257
22	350	346	330	265	261	277	197	805	393	48	148	215
23	300	322	407	268	267	263	169	697	367	48	135	178
24	260	309	414	271	268	260	154	609	1360	47	112	159
25	240	322	381	255	274	278	127	651	677	47	102	146
26	230	349	372	243	268	278	116	593	388	46	85	130
27	250	336	319	232	240	275	226	806	273	47	92	623
28	600	304	294	234	227	285	451	639	225	46	109	367
29	1000	280	287	230	---	286	343	491	209	47	77	3740
30	600	273	284	218	---	283	322	419	190	47	54	18100
31	300	---	286	215	---	264	---	410	---	48	50	---
TOTAL	19060	10161	9371	7809	7183	8888	8872	47893	25436	2941	4836	27609
MEAN	615	339	302	252	257	287	296	1545	848	94.9	156	920
MAX	3500	1350	414	290	426	650	1330	12100	2970	308	1120	18100
MIN	90	146	176	200	217	212	116	96	190	46	50	72
AC-FT	37810	20150	18590	15490	14250	17630	17600	95000	50450	5830	9590	54760

WTR YR 1986 TOTAL 180059 MEAN 493 MAX 18100 MIN 46 AC-FT 357100

ARKANSAS RIVER BASIN

123

07229300 WALNUT CREEK AT PURCELL, OK

LOCATION.--Lat 34°59'56", long 97°22'00", NW 1/4 NW 1/4 sec.13, T.6 N., R.2 W., McClain County, Hydrologic Unit 11090202, on downstream side of right bank pier of bridge on U.S. Highway 77, at south edge of Purcell, and at mile 1.0.

DRAINAGE AREA.--202 mi<sup>2</sup>.

PERIOD OF RECORD.--Water years 1951-55, 1958-65 (occasional low-flow measurements). October 1965 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,014.57 ft, National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1984, datum 3.00 ft higher.

REMARKS.--Estimated daily discharges: Oct. 3-9, Dec. 1-3, 11-15, Jan. 1, 8, 9, 15, Feb. 10-13, Mar. 21 to Apr. 2, 6, 8-18, 21-26, 29, and May 2-9, 12, 13. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--21 years, 62.6 ft<sup>3</sup>/s, 45,350 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 67,700 ft<sup>3</sup>/s, Oct. 20, 1983, gage height, 21.40 ft (datum then in use), from rating curve extended above 20,000 ft, on basis of multiple contracted opening measurement at peak; no flow at times in 1966-67, and 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft<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. 18	0945	6,230	13.58	May 17	0845	3,420	11.36
May 15	0530	*11,000	*16.26	Sept. 29	1645	4,270	12.19

Minimum daily discharge, 15 ft<sup>3</sup>/s, Aug. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	130	70	52	47	41	36	38	90	50	33	21	20
2	113	64	53	48	40	37	39	70	48	36	27	27
3	100	60	52	47	43	37	597	54	49	35	25	25
4	85	56	54	46	42	37	524	50	60	33	24	25
5	74	54	48	45	44	37	169	47	128	32	25	27
6	64	51	47	47	48	37	110	43	105	31	27	25
7	52	48	46	47	48	38	78	41	114	31	27	23
8	45	45	45	45	49	38	70	40	79	31	25	22
9	40	44	46	45	46	41	60	39	56	31	30	22
10	130	40	48	51	45	44	52	150	107	30	375	36
11	158	39	44	49	46	419	46	198	125	29	46	114
12	127	42	42	48	45	316	44	70	57	29	24	36
13	202	75	40	46	45	79	41	60	47	29	20	25
14	277	165	45	46	46	63	40	723	43	29	19	28
15	167	309	50	45	44	83	39	4220	58	28	20	36
16	141	99	58	47	43	71	40	300	124	28	23	29
17	131	66	53	46	41	62	38	1420	83	28	22	44
18	2740	286	49	45	40	239	37	287	52	27	20	51
19	377	140	47	43	39	71	80	151	47	26	19	31
20	211	61	48	44	39	63	106	108	45	26	17	26
21	167	55	46	43	38	55	60	86	43	26	16	24
22	145	52	46	42	38	50	50	73	41	26	16	23
23	131	50	45	42	37	45	47	64	40	26	16	23
24	117	48	45	43	37	40	44	58	42	27	16	23
25	107	53	45	43	37	39	42	77	42	26	16	22
26	100	55	47	41	37	38	40	67	38	26	15	23
27	93	51	50	40	37	38	120	90	37	25	18	82
28	88	48	47	43	36	37	107	62	35	24	22	39
29	87	48	47	42	---	37	70	51	34	23	18	954
30	82	53	47	40	---	38	65	49	33	22	16	465
31	75	---	47	41	---	39	---	51	---	21	17	---
TOTAL	6556	2327	1479	1387	1171	2304	2893	8889	1862	874	1022	2350
MEAN	211	77.6	47.7	44.7	41.8	74.3	96.4	287	62.1	28.2	33.0	78.3
MAX	2740	309	58	51	49	419	597	4220	128	36	375	954
MIN	40	39	40	40	36	36	37	39	33	21	15	20
AC-FT	13000	4620	2930	2750	2320	4570	5740	17630	3690	1730	2030	4660

CAL YR 1985 TOTAL 80574 MEAN 221 MAX 10700 MIN 16 AC-FT 159800  
WTR YR 1986 TOTAL 33114 MEAN 90.7 MAX 4220 MIN 15 AC-FT 65680

## ARKANSAS RIVER BASIN

## 07229900 LAKE THUNDERBIRD NEAR NORMAN, OK

LOCATION.--Lat 35°13'15", long 97°13'05", in NW 1/4 SE 1/4 sec.29, T.9 N., R.1 E., Cleveland County, Hydrologic Unit 11090203, near center of dam on Little River, just downstream from Hog Creek, 13 mi east of Norman, and at mile 96.4.

DRAINAGE AREA.--256 mi<sup>2</sup>.

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

GAGE.--Nonrecording gage at outlet structure and at pump house. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth dam. Regulated storage began Mar. 1, 1965; minimum conservation pool first filled September 1965. Capacity, 196,200 acre-ft at elevation 1,049.4 ft, crest of drop inlet; 119,600 acre-ft at elevation 1,039.0 ft, top of conservation pool; 13,640 acre-ft at elevation 1,010.0 ft, minimum conservation pool. Dead storage, 1,200 acre-ft below elevation 997.0 ft, sill of gated outlet. Figures given herein represent total contents. Reservoir is used for flood control, irrigation (inactive), and municipal water supplies diverted to Del City, Midwest City, and Norman.

COOPERATION.--Elevations and data on diversions furnished by Central Oklahoma Master Conservancy District.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 172,900 acre-ft, Mar. 5, 1985, elevation, 1,046.61 ft; minimum since conservation pool first reached, 15,370 acre-ft, Nov. 30, 1965, elevation, 1,011.0 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 138,300 acre-ft, May 19, elevation, 1,041.92 ft; minimum, 110,000 acre-ft, Sept. 26, elevation, 1,037.37 ft.

## MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Elevation (feet)*	Contents (acre-feet)	Change in contents (acre-feet)	Diversions (acre-feet)
Sept. 30.....	1038.22	114,900	-	-
Oct. 31.....	1039.02	119,700	+4,800	1,130
Nov. 30.....	1039.07	120,000	+300	1,015
Dec. 31.....	1039.14	120,500	+500	1,213
CAL YR 85.....	-	-	-4,300	15,004
Jan. 31.....	1039.14	120,500	0	1,208
Feb. 28.....	1038.99	119,500	-1,000	1,076
Mar. 31.....	1038.94	119,200	-300	1,278
Apr. 30.....	1039.23	121,000	+1,800	1,331
May 31.....	1040.80	130,900	+9,900	1,443
June 30.....	1039.06	119,900	-11,000	1,412
July 31.....	1037.96	113,400	-6,500	2,360
Aug. 31.....	1037.40	110,200	-3,200	1,692
Sept. 30.....	1040.16	126,800	+16,600	1,176
WTR YR 86.....	-	-	+11,900	16,334

\*Elevation at 0800 on the following day.

## ARKANSAS RIVER BASIN

125

351307097132401 LAKE THUNDERBIRD DAMSITE CROSS SECTION SITE NO. 1

LOCATION.--Lat 35°13'07", long 97°13'24".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	SAMPLING DEPTH (FEET)	RESERVOIR STORAGE (AC-FT)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, SATURATION (PERCENT)
NOV											
21...	1504	1028	1028	1.00	125000	351	7.90	12.5	740	8.7	84
21...	1505	1028	1028	5.00	125000	349	7.90	12.5	740	8.8	85
21...	1506	1028	1028	10.0	125000	350	7.80	12.5	740	8.8	85
21...	1507	1028	1028	15.0	125000	350	7.80	12.5	740	8.6	83
21...	1509	1028	1028	20.0	125000	351	7.80	12.0	740	8.8	85
21...	1510	1028	1028	25.0	125000	348	7.80	12.5	740	9.0	87
21...	1512	1028	1028	30.0	125000	350	7.80	12.5	740	8.8	85
21...	1514	1028	1028	35.0	125000	351	7.80	12.0	740	8.7	84
21...	1516	1028	1028	39.0	125000	350	7.80	12.5	740	8.9	86
MAR											
20...	1126	1028	1028	37.0	120000	383	7.70	10.5	750	8.0	73
20...	1129	1028	1028	30.0	120000	385	--	10.5	750	8.3	76
20...	1130	1028	1028	25.0	120000	385	--	10.5	750	8.4	77
20...	1132	1028	1028	20.0	120000	384	--	10.5	750	8.5	77
20...	1134	1028	1028	15.0	120000	385	--	11.0	750	8.4	77
20...	1135	1028	1028	10.0	120000	384	--	10.5	750	8.3	76
20...	1137	1028	1028	5.00	120000	384	--	10.5	750	8.2	75
20...	1138	1028	1028	1.00	120000	385	--	11.0	750	8.2	76
JUL											
08...	0908	1028	1028	1.00	119000	385	7.80	27.5	740	6.5	85
08...	0910	1028	1028	5.00	119000	386	7.80	27.5	740	6.4	83
08...	0914	1028	1028	10.0	119000	386	7.70	27.0	740	5.9	77
08...	0916	1028	1028	15.0	119000	386	7.60	27.0	740	5.7	74
08...	0918	1028	1028	20.0	119000	387	7.60	26.5	740	5.4	69
08...	0920	1028	1028	25.0	119000	388	7.40	26.0	740	3.7	47
08...	0922	1028	1028	30.0	119000	387	7.20	23.0	740	0.8	10
08...	0925	1028	1028	32.0	119000	339	7.20	22.5	740	0.8	10
SEP											
17...	1011	1028	1028	1.00	111000	404	7.80	23.0	740	7.4	89
17...	1017	1028	1028	5.00	111000	402	7.80	23.0	740	6.2	75
17...	1019	1028	1028	10.0	111000	401	7.60	23.0	740	6.2	75
17...	1020	1028	1028	15.0	111000	402	7.70	23.0	740	6.2	74
17...	1022	1028	1028	20.0	111000	400	7.70	23.0	740	6.2	75
17...	1025	1028	1028	25.0	111000	400	7.70	23.0	740	6.2	75
17...	1028	1028	1028	30.0	111000	399	7.60	23.0	740	6.2	75
17...	1030	1028	1028	32.0	111000	399	7.50	23.0	740	6.2	75

351320097131801 LAKE THUNDERBIRD DAMSITE CROSS SECTION SITE NO. 2

LOCATION.--Lat 35°13'20", long 97°13'18".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Samples were collected in a Kemmerer sampler. Specific conductance, pH, water temperature and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)
NOV										
21...	1428	1028	80020	1.00	125000	349	7.60	10.0	12.5	13
21...	1429	1028	1028	5.00	125000	347	7.70	--	12.5	--
21...	1431	1028	1028	10.0	125000	349	7.70	--	12.5	--
21...	1432	1028	1028	15.0	125000	349	7.70	--	12.5	--
21...	1435	1028	80020	20.0	125000	348	7.70	10.0	12.0	12
21...	1442	1028	1028	25.0	125000	349	7.80	--	12.0	--
21...	1445	1028	1028	30.0	125000	349	7.80	--	12.0	--
21...	1447	1028	1028	35.0	125000	350	7.80	--	12.0	--
21...	1449	1028	1028	40.0	125000	350	7.80	--	12.0	--
21...	1451	1028	80020	46.0	125000	348	7.80	10.0	12.0	20
MAR										
20...	1055	1028	80020	37.0	120000	386	8.10	--	10.5	24
20...	1058	1028	1028	30.0	120000	386	8.10	--	10.0	--
20...	1100	1028	1028	25.0	120000	385	8.10	--	10.5	--
20...	1103	1028	80020	20.0	120000	385	8.80	--	10.5	21
20...	1108	1028	1028	15.0	120000	386	8.60	--	10.5	--
20...	1109	1028	1028	10.0	120000	387	8.80	--	10.5	--
20...	1111	1028	1028	5.00	120000	387	8.80	--	10.5	--
20...	1114	1028	80020	1.00	120000	385	--	--	11.0	21
JUL										
08...	0932	1028	80020	1.00	119000	385	7.80	--	27.5	2.0
08...	0935	1028	1028	5.00	119000	383	7.90	--	27.5	--
08...	0936	1028	1028	10.0	119000	384	7.90	--	27.5	--
08...	0938	1028	1028	15.0	119000	384	7.80	--	27.0	--
08...	0940	1028	80020	20.0	119000	384	7.80	--	27.0	2.5
08...	0948	1028	1028	25.0	119000	384	7.80	--	26.0	--
08...	0950	1028	1028	30.0	119000	385	7.50	--	24.0	--
08...	0952	1028	1028	35.0	119000	389	7.40	--	22.0	--
08...	0955	1028	80020	39.0	119000	390	7.40	--	21.5	330
SEP										
17...	1040	1028	80020	1.00	111000	398	7.60	--	23.5	5.0
17...	1044	1028	1028	5.00	111000	391	7.50	--	23.5	--
17...	1046	1028	1028	10.0	111000	398	7.50	--	23.5	--
17...	1047	1028	1028	15.0	111000	396	7.50	--	23.5	--
17...	1049	1028	80020	20.0	111000	399	7.60	--	23.5	4.6
17...	1051	1028	1028	25.0	111000	398	7.50	--	23.0	--
17...	1053	1028	1028	30.0	111000	399	7.50	--	23.0	--
17...	1055	1028	1028	35.0	111000	398	7.50	--	23.0	--
17...	1058	1028	80020	37.0	111000	398	7.50	--	23.5	52



## ARKANSAS RIVER BASIN

351320097131801 LAKE THUNDERBIRD DAMSITE CROSS SECTION SITE NO. 2--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM
NOV									
21...	740	8.6	83	150	8	34	17	12	14
21...	740	8.8	85	--	--	--	--	--	--
21...	740	8.6	83	--	--	--	--	--	--
21...	740	9.0	87	--	--	--	--	--	--
21...	740	8.8	85	150	15	34	17	12	14
21...	740	9.2	88	--	--	--	--	--	--
21...	740	8.4	81	--	--	--	--	--	--
21...	740	8.5	82	--	--	--	--	--	--
21...	740	8.8	84	--	--	--	--	--	--
21...	740	8.8	84	150	10	33	17	12	14
MAR									
20...	750	8.0	73	170	4	36	19	13	14
20...	750	8.2	74	--	--	--	--	--	--
20...	750	8.0	73	--	--	--	--	--	--
20...	750	8.3	76	170	4	36	20	13	14
20...	750	8.3	76	--	--	--	--	--	--
20...	750	8.4	77	--	--	--	--	--	--
20...	750	8.4	77	--	--	--	--	--	--
20...	750	8.2	76	170	4	36	19	13	14
JUL									
08...	740	6.9	90	170	1	35	19	13	14
08...	740	7.0	92	--	--	--	--	--	--
08...	740	7.0	91	--	--	--	--	--	--
08...	740	6.4	83	--	--	--	--	--	--
08...	740	6.2	80	170	1	35	19	13	14
08...	740	4.6	59	--	--	--	--	--	--
08...	740	1.4	17	--	--	--	--	--	--
08...	740	0.8	9	--	--	--	--	--	--
08...	740	0.7	8	170	0	36	19	13	14
SEP									
17...	740	6.8	83	170	4	36	20	14	15
17...	740	6.8	83	--	--	--	--	--	--
17...	740	6.9	84	--	--	--	--	--	--
17...	740	6.5	79	--	--	--	--	--	--
17...	740	6.4	77	180	5	36	21	14	14
17...	740	6.4	77	--	--	--	--	--	--
17...	740	6.4	77	--	--	--	--	--	--
17...	740	6.4	77	--	--	--	--	--	--
17...	740	6.3	76	170	6	35	21	14	15

351320097131801 LAKE THUNDERBIRD DAMSITE CROSS SECTION SITE NO. 2--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
NOV									
21...	0.4	2.9	179	0	147	7.1	10	16	188
21...	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--
21...	0.4	3.0	171	0	140	5.4	22	17	192
21...	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--
21...	0.4	2.9	173	0	142	4.4	8.5	16	192
MAR									
20...	0.4	3.4	200	0	164	2.5	9.9	20	188
20...	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--
20...	0.4	3.3	205	0	168	0.5	9.6	19	195
20...	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--
20...	0.4	3.3	200	0	164	--	9.7	19	197
JUL									
08...	0.5	3.5	201	0	165	5.1	10	19	214
08...	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--
08...	0.5	3.5	201	0	165	5.1	9.7	18	204
08...	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--
08...	0.4	3.5	215	0	176	14	9.9	15	209
SEP									
17...	0.5	3.6	--	--	--	8.2	11	18	240
17...	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--
17...	0.5	3.7	140	0	171	5.6	15	18	228
17...	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--
17...	0.5	3.8	--	--	--	10	12	17	244

## ARKANSAS RIVER BASIN

129

351333097131201 LAKE THUNDERBIRD DAMSITE CROSS SECTION NO. 3

LOCATION.--Lat 35°13'33", long 97°13'12".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV											
21...	1409	1028	1028	1.00	125000	348	7.80	12.5	740	8.4	82
21...	1410	1028	1028	5.00	125000	347	7.80	12.5	740	8.6	83
21...	1412	1028	1028	10.0	125000	349	7.80	12.5	740	8.3	80
21...	1413	1028	1028	15.0	125000	349	7.80	12.5	740	8.8	85
21...	1415	1028	1028	20.0	125000	349	7.80	12.5	740	8.7	84
21...	1417	1028	1028	25.0	125000	349	7.80	12.5	740	8.6	83
21...	1418	1028	1028	30.0	125000	348	7.80	12.0	740	8.5	81
21...	1420	1028	1028	35.0	125000	348	7.80	12.0	740	8.8	84
MAR											
20...	1031	1028	1028	32.0	120000	387	8.80	10.5	750	8.3	76
20...	1033	1028	1028	25.0	120000	384	8.60	10.0	750	8.4	76
20...	1036	1028	1028	20.0	120000	385	8.60	10.0	750	8.2	74
20...	1037	1028	1028	15.0	120000	385	8.60	10.0	750	8.1	73
20...	1039	1028	1028	10.0	120000	384	8.60	10.5	750	8.2	75
20...	1041	1028	1028	5.00	120000	386	8.60	10.5	750	8.3	76
20...	1042	1028	1028	1.00	120000	387	8.60	11.0	750	8.3	77
JUL											
08...	1008	1028	1028	1.00	119000	385	8.00	27.5	740	6.8	89
08...	1010	1028	1028	5.00	119000	387	8.00	27.5	740	6.8	89
08...	1012	1028	1028	10.0	119000	385	8.00	27.5	740	6.8	89
08...	1014	1028	1028	15.0	119000	385	7.90	27.0	740	6.0	78
08...	1015	1028	1028	20.0	119000	387	7.80	27.0	740	5.0	65
08...	1017	1028	1028	25.0	119000	388	7.70	26.5	740	3.9	50
08...	1019	1028	1028	30.0	119000	385	7.40	23.5	740	0.8	10
08...	1021	1028	1028	35.0	119000	389	7.40	22.5	740	0.7	8
08...	1023	1028	1028	38.0	119000	388	7.40	21.5	740	0.7	8
SEP											
17...	1111	1028	1028	1.00	111000	399	7.60	23.5	740	6.7	82
17...	1113	1028	1028	5.00	111000	398	7.70	23.5	740	6.9	84
17...	1115	1028	1028	10.0	111000	397	7.80	23.5	740	6.9	84
17...	1116	1028	1028	15.0	111000	398	7.80	23.5	740	6.6	80
17...	1118	1028	1028	20.0	111000	399	7.80	23.5	740	6.5	79
17...	1120	1028	1028	25.0	111000	399	7.80	23.5	740	6.4	77
17...	1122	1028	1028	30.0	111000	399	7.80	23.0	740	6.5	79
17...	1124	1028	1028	33.0	111000	399	7.80	23.0	740	6.2	75

## ARKANSAS RIVER BASIN

351317097145101 LAKE THUNDERBIRD LITTLE RIVER CROSS SECTION

LOCATION.--Lat 35°13'17", long 97°14'51".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	SAMPLE DEPTH (FEET)	RESERVOIR STORAGE (AC-FT)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, SATURATED (PERCENT)
NOV											
21...	1310	1028	1028	1.00	125000	345	7.50	12.5	740	8.6	83
21...	1311	1028	1028	5.00	125000	344	7.60	12.5	740	8.8	85
21...	1314	1028	1028	10.0	125000	347	7.60	12.5	740	8.8	85
21...	1317	1028	1028	15.0	125000	346	7.70	12.5	740	9.0	87
21...	1319	1028	1028	20.0	125000	347	7.70	12.5	740	9.2	89
21...	1320	1028	1028	25.0	125000	348	7.70	12.5	740	9.4	91
21...	1322	1028	1028	30.0	125000	346	7.70	12.5	740	8.8	85
21...	1325	1028	1028	35.0	125000	348	7.80	12.0	740	9.0	86
21...	1327	1028	1028	37.0	125000	348	7.80	12.0	740	9.1	87
MAR											
20...	0934	1028	1028	44.0	120000	392	7.80	11.0	750	7.2	66
20...	0936	1028	1028	40.0	120000	390	7.80	10.5	750	8.2	75
20...	0938	1028	1028	35.0	120000	393	7.80	10.5	750	8.2	75
20...	0941	1028	1028	30.0	120000	394	7.80	10.5	750	8.3	76
20...	0942	1028	1028	25.0	120000	394	7.80	10.5	750	8.3	76
20...	0944	1028	1028	20.0	120000	391	7.80	10.5	750	8.1	74
20...	0946	1028	1028	15.0	120000	392	7.80	10.5	750	8.0	73
20...	0948	1028	1028	10.0	120000	391	7.90	11.0	750	8.1	75
20...	0952	1028	1028	5.00	120000	392	--	10.5	750	8.0	73
20...	0953	1028	1028	1.00	120000	392	--	11.0	750	8.1	75
JUL											
08...	1140	1028	1028	1.00	119000	382	8.00	28.0	740	6.9	91
08...	1142	1028	1028	5.00	119000	382	8.00	28.0	740	7.0	92
08...	1143	1028	1028	10.0	119000	383	7.90	28.0	740	6.9	91
08...	1145	1028	1028	15.0	119000	384	7.80	27.5	740	7.0	92
08...	1147	1028	1028	20.0	119000	385	7.70	27.5	740	5.7	74
08...	1148	1028	1028	25.0	119000	388	7.40	26.5	740	3.2	41
08...	1151	1028	1028	33.0	119000	392	7.30	22.0	740	0.8	9
SEP											
17...	1236	1028	1028	1.00	111000	397	7.80	24.0	740	7.1	87
17...	1238	1028	1028	5.00	111000	397	7.80	24.0	740	7.3	90
17...	1240	1028	1028	10.0	111000	396	7.80	24.0	740	7.3	89
17...	1242	1028	1028	15.0	111000	397	7.70	23.5	740	7.1	87
17...	1244	1028	1028	20.0	111000	399	7.60	23.5	740	6.3	77
17...	1246	1028	1028	25.0	111000	400	7.50	23.5	740	5.8	70
17...	1248	1028	1028	30.0	111000	401	7.40	23.0	740	5.6	68
17...	1250	1028	1028	33.0	111000	401	7.40	23.0	740	5.6	68

## ARKANSAS RIVER BASIN

351255097151001 LAKE THUNDERBIRD CLEAR CREEK CROSS SECTION

LOCATION.--Lat 35°12'55", long 97°15'10".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV										
21...	1245	1028	1028	1.00	125000	348	7.60	12.0	740	8.8
21...	1249	1028	1028	5.00	125000	341	7.60	12.0	740	9.3
21...	1251	1028	1028	10.0	125000	347	7.60	12.0	740	8.8
21...	1253	1028	1028	15.0	125000	343	7.70	12.0	740	9.2
21...	1255	1028	1028	20.0	125000	343	7.70	12.0	740	9.1
21...	1257	1028	1028	25.0	125000	348	7.70	12.0	740	8.4
21...	1259	1028	1028	28.0	125000	347	7.80	12.0	740	9.2
MAR										
20...	0903	1028	1028	28.0	120000	394	7.70	11.0	750	8.2
20...	0907	1028	1028	25.0	120000	392	7.70	10.5	750	8.1
20...	0910	1028	1028	15.0	120000	394	7.70	11.0	750	8.4
20...	0913	1028	1028	20.0	120000	395	7.70	11.0	750	8.2
20...	0915	1028	1028	10.0	120000	394	7.70	10.5	750	8.2
20...	0917	1028	1028	5.00	120000	394	7.70	11.0	750	8.2
20...	0918	1028	1028	1.00	120000	395	7.70	11.0	750	8.2
JUL										
08...	1223	1028	1028	1.00	119000	381	8.00	28.5	740	6.7
08...	1226	1028	1028	5.00	119000	382	8.10	28.5	740	6.9
08...	1228	1028	1028	10.0	119000	383	8.00	28.0	740	6.9
08...	1230	1028	1028	15.0	119000	383	8.00	28.0	740	6.8
08...	1231	1028	1028	20.0	119000	386	7.70	27.0	740	4.7
08...	1233	1028	1028	25.0	119000	392	7.50	25.5	740	2.2
08...	1236	1028	1028	30.0	119000	393	7.30	23.0	740	0.5
SEP										
17...	1300	1028	1028	1.00	111000	398	7.70	24.0	740	7.1
17...	1302	1028	1028	5.00	111000	396	7.60	24.0	740	7.4
17...	1304	1028	1028	10.0	111000	394	7.60	23.5	740	7.1
17...	1305	1028	1028	15.0	111000	392	7.60	23.5	740	6.9
17...	1308	1028	1028	20.0	111000	396	7.60	23.5	740	6.7
17...	1310	1028	1028	25.0	111000	399	7.60	23.5	740	6.2
17...	1312	1028	1028	26.0	111000	400	7.60	23.5	740	6.2

## ARKANSAS RIVER BASIN

351318097155901 LAKE THUNDERBIRD LITTLE RIVER ABOVE CLEAR CREEK

LOCATION.--Lat 35°13'18", long 97°15'59".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Samples were collected in a Kemmerer Sampler. Specific conductance, pH, water temperature, and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV											
21...	1146	1028	1028	1.00	125000	347	7.60	12.0	740	8.8	84
21...	1152	1028	1028	2.00	125000	341	7.60	12.0	740	7.6	73
21...	1158	1028	1028	6.00	125000	340	7.60	12.0	740	8.6	82
21...	1202	1028	1028	10.0	125000	343	7.50	12.0	740	9.1	87
21...	1206	1028	1028	14.0	125000	343	7.60	12.0	740	9.2	88
21...	1210	1028	1028	18.0	125000	343	7.60	12.0	740	8.8	84
21...	1213	1028	1028	23.0	125000	343	7.70	12.0	740	9.2	88
21...	1215	1028	1028	26.0	125000	344	7.70	12.0	740	9.2	88
MAR											
20...	0833	1028	1028	1.00	120000	409	7.80	11.5	750	8.8	82
20...	0845	1028	1028	26.0	120000	392	7.70	11.5	750	8.1	76
20...	0846	1028	1028	20.0	120000	392	7.70	11.0	750	8.2	76
20...	0849	1028	1028	15.0	120000	396	7.50	11.5	750	8.2	77
20...	0851	1028	1028	10.0	120000	398	7.60	11.0	750	8.3	77
20...	0852	1028	1028	5.00	120000	396	7.60	11.0	750	8.4	77
JUL											
08...	1314	1028	1028	1.00	119000	387	8.10	29.0	740	6.7	90
08...	1316	1028	1028	5.00	119000	381	8.00	28.5	740	6.9	92
08...	1318	1028	1028	10.0	119000	389	8.00	28.0	740	6.4	84
08...	1320	1028	1028	15.0	119000	390	8.00	27.5	740	6.4	84
08...	1322	1028	1028	20.0	119000	394	7.80	27.0	740	4.5	58
SEP											
17...	1322	1028	1028	1.00	111000	398	7.80	24.0	740	7.6	93
17...	1324	1028	1028	5.00	111000	389	7.80	24.0	740	7.4	91
17...	1326	1028	1028	10.0	111000	397	7.80	24.0	740	7.4	91
17...	1328	1028	1028	15.0	111000	397	7.80	24.0	740	7.4	91
17...	1330	1028	1028	20.0	111000	398	7.80	24.0	740	6.9	84
17...	1332	1028	1028	25.0	111000	396	7.70	23.5	740	6.4	78
17...	1334	1028	1028	30.0	111000	400	7.60	23.5	740	5.3	64



## ARKANSAS RIVER BASIN

133

351442097140201 LAKE THUNDERBIRD HOG CREEK CROSS SECTION

LOCATION.--Lat 35°14'42", long 97°14'02".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV											
21...	1343	1028	1028	1.00	125000	351	7.90	12.0	740	8.8	85
21...	1344	1028	1028	5.00	125000	349	7.80	12.0	740	9.2	88
21...	1346	1028	1028	10.0	125000	348	7.80	12.0	740	9.4	90
21...	1348	1028	1028	15.0	125000	348	7.80	12.0	740	9.2	88
21...	1350	1028	1028	20.0	125000	350	7.80	12.0	740	9.3	89
21...	1353	1028	1028	25.0	125000	350	7.80	12.0	740	9.3	89
21...	1355	1028	1028	30.0	125000	349	7.80	11.5	740	9.2	87
21...	1357	1028	1028	34.0	125000	349	7.80	11.5	740	7.8	74
MAR											
20...	1007	1028	1028	30.0	120000	388	--	10.5	750	8.3	76
20...	1009	1028	1028	25.0	120000	388	--	10.5	750	8.4	77
20...	1010	1028	1028	20.0	120000	387	--	10.5	750	8.2	75
20...	1012	1028	1028	15.0	120000	386	--	11.0	750	8.1	75
20...	1013	1028	1028	10.0	120000	386	--	11.0	750	8.3	77
20...	1015	1028	1028	5.00	120000	386	--	11.0	750	8.2	76
20...	1016	1028	1028	1.00	120000	386	--	11.0	750	8.2	76
JUL											
08...	1115	1028	1028	1.00	119000	377	8.60	29.5	740	7.1	97
08...	1118	1028	1028	5.00	119000	383	8.60	29.0	740	6.5	87
08...	1119	1028	1028	10.0	119000	385	8.40	28.5	740	5.7	76
08...	1121	1028	1028	15.0	119000	385	8.40	28.5	740	6.6	88
08...	1122	1028	1028	20.0	119000	386	8.30	28.0	740	5.8	77
08...	1124	1028	1028	25.0	119000	385	8.10	26.5	740	3.7	48
08...	1126	1028	1028	30.0	119000	393	7.80	23.5	740	0.7	9
SEP											
17...	1137	1028	1028	1.00	111000	397	7.80	24.5	740	7.3	90
17...	1141	1028	1028	5.00	111000	396	7.80	24.0	740	7.4	91
17...	1142	1028	1028	10.0	111000	397	7.80	24.0	740	7.4	91
17...	1144	1028	1028	15.0	111000	397	7.80	24.0	740	7.2	88
17...	1146	1028	1028	20.0	111000	397	7.70	24.0	740	7.4	91
17...	1148	1028	1028	25.0	111000	395	7.60	24.0	740	7.3	89
17...	1150	1028	1028	28.0	111000	398	7.60	24.0	740	7.0	86

## ARKANSAS RIVER BASIN

07230000 LITTLE RIVER BELOW LAKE THUNDERBIRD NEAR NORMAN, OK

LOCATION.--Lat 35°13'18", long 97°12'49", in NE 1/4 SE 1/4 sec.29, T.9 N., R.1 E., Cleveland County, Hydrologic Unit, 11090203, at right bank of outlet channel, 170 ft upstream from State Highway 9, 1,200 ft downstream from Lake Thunderbird, 1.0 mi upstream from Prairie Creek, 13.0 mi east of Norman, and at mile 96.2.

DRAINAGE AREA.--257 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1952 to current year. Prior to October 1964, published as Little River below Hog Creek near Norman.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 965.62 ft, National Geodetic Vertical Datum of 1929. Prior to Nov. 28, 1956, nonrecording gage 800 ft downstream at same datum. Nov. 28, 1956 to Oct. 14, 1964, water-stage recorder at site 800 ft downstream at same datum. Oct. 15, 1964 to Sept. 1, 1965, nonrecording gage at site 170 ft downstream at same datum.

REMARKS.--Estimated daily discharges: May 3-14, 16-31, and June 1-26. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by Lake Thunderbird since March 1965 (station 07229900). In prior years, occasional small diversions above station for irrigation.

AVERAGE DISCHARGE.--(Prior to regulation by Lake Thunderbird) 12 years (water years 1952-64), 58.9 ft<sup>3</sup>/s, 42,640 acre-ft/yr; (after regulation by Lake Thunderbird) 21 years, (water years 1966-86), 35.3 ft<sup>3</sup>/s, 25,570 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,600 ft<sup>3</sup>/s, May 25, 1957, gage height, 28.85 ft, from high-water mark, at site then in use, from rating curve extended above 15,000 ft<sup>3</sup>/s; no flow at times in 1954-56, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 547 ft<sup>3</sup>/s, Nov. 25, gage height, 5.99 ft; minimum daily discharge, .53 ft<sup>3</sup>/s, Jan. 22-31, and Feb. 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.61	.78	.69	.68	.54	.62	.69	.87	437	.80	.87	.93
2	.61	.78	.69	.69	.54	.59	.78	.87	57	.86	.87	.80
3	.61	.78	.69	.69	.56	.57	1.4	.87	163	.87	.87	.86
4	.59	.78	.69	.64	.54	.58	118	.87	270	.87	.87	.79
5	.61	.78	.69	.64	.59	.57	290	.87	270	.87	.99	.86
6	.61	.77	.69	.69	.57	.61	289	.87	323	.87	.87	1.5
7	.61	.78	.69	.62	.58	.61	289	.87	437	.87	.87	.78
8	.61	.78	.69	.64	.53	.61	289	.87	437	.87	.87	.78
9	.61	.78	.68	.68	.53	.63	289	.87	437	.87	1.1	.76
10	.76	.78	.69	.69	108	.62	289	.87	437	.82	.94	.88
11	.65	.78	.69	.69	185	1.9	119	.80	437	.87	.87	.89
12	.61	.79	.69	.67	183	.69	1.1	163	437	.85	.85	.75
13	1.1	.79	.67	.69	182	170	1.1	270	437	.85	.87	.71
14	1.0	.83	.69	.73	182	287	1.1	203	437	.84	.87	.81
15	.61	.83	.69	.61	182	287	1.1	128	437	.85	.87	.74
16	.61	.78	.69	.61	120	285	1.1	270	437	.87	.85	.72
17	.65	.78	.69	.61	.62	285	.98	11	437	.87	.84	.89
18	1.8	1.0	.68	.57	.61	286	1.0	.80	437	.87	.85	.75
19	105	1.1	.69	.60	.61	287	1.1	163	437	.87	.86	.70
20	256	167	.69	.59	.61	287	.96	270	358	.87	.84	.69
21	380	300	.69	.57	.61	112	.94	355	270	.87	.85	.69
22	429	298	.69	.53	.61	.72	.97	437	270	.87	.87	.69
23	428	297	.69	.53	.61	.69	.94	437	172	.87	.86	.69
24	351	296	.66	.53	.61	.69	.93	437	.80	.87	.87	.66
25	135	432	.67	.53	.61	.69	.93	437	.80	.87	.87	.69
26	.78	544	.69	.53	.59	.71	.93	325	.80	.90	.87	.84
27	.74	404	.69	.53	.56	.74	1.1	.80	.80	.87	.85	.92
28	.73	289	.69	.53	.58	.72	.87	169	.79	.87	.87	.69
29	.77	193	.69	.53	---	.72	.87	355	.78	.87	.84	1.1
30	161	.79	.69	.53	---	.69	.91	437	.78	.87	.83	.98
31	153	---	.68	.53	---	.69	---	437	---	.89	.82	---
TOTAL	2414.28	3236.26	21.29	18.90	1154.21	2301.66	1993.80	5315.10	8276.54	26.80	27.09	24.54
MEAN	77.9	108	.69	.61	41.2	74.2	66.5	171	276	.86	.87	.82
MAX	429	544	.69	.73	185	287	290	437	437	.90	1.1	1.5
MIN	.59	.77	.66	.53	.53	.57	.69	.80	.78	.80	.82	.66
AC-FT	4790	6420	42	37	2290	4570	3950	10540	16420	53	54	49

CAL YR 1985 TOTAL 91872.06 MEAN 252 MAX 910 MIN .59 AC-FT 182200  
WTR YR 1986 TOTAL 24810.16 MEAN 68.0 MAX 544 MIN .53 AC-FT 49210

ARKANSAS RIVER BASIN

135

07230500 LITTLE RIVER NEAR TECUMSEH, OK

LOCATION.--Lat 35°10'25", long 96°55'55", near northwest corner sec.18, T.8 N., R.4 E., Pottawatomie County, Hydrologic Unit 11090203, on downstream side of center pier of bridge on U.S. Highway 177, 1.5 mi downstream from Dance Creek, 5.0 mi south of Tecumseh, and at mile 77.2.

DRAINAGE AREA.--456 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1943 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 898.52 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Estimated daily discharges: Oct. 23 to Nov. 5, 7-18, Nov. 20 to Dec. 8, 14, 21, 22, 25, Jan. 13-22, June 26, July 7 to Aug. 5, 7, and Sept. 19-26. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated or diverted since 1965 by Lake Thunderbird, 19.2 mi upstream (station 07229900).

AVERAGE DISCHARGE.--Prior to regulation by Lake Thunderbird, 21 years (water years 1944-64), 149 ft<sup>3</sup>/s, 107,900 acre-ft/yr; since regulation by Lake Thunderbird, 21 years (water years 1966-86), 106 ft<sup>3</sup>/s, 76,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,400 ft<sup>3</sup>/s, May 25, 1957, gage height, 18.84 ft, maximum gage height, 19.68 ft, May 18, 1949; no flow at times in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1932 reached a stage of 25.58 ft, from floodmark.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,670 ft<sup>3</sup>/s, May 17, gage height, 15.63 ft; minimum daily discharge, 2.3 ft<sup>3</sup>/s, Aug. 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.6	50	60	25	24	19	30	30	529	21	5.2	3.4
2	7.7	23	52	26	24	20	52	26	332	22	5.0	5.1
3	6.7	22	45	25	25	20	526	23	112	20	4.8	4.4
4	6.1	22	41	25	25	19	716	22	382	18	4.4	5.3
5	5.4	21	37	25	26	19	574	20	418	17	5.0	4.9
6	5.3	20	35	25	47	19	449	21	446	15	9.6	6.2
7	5.2	19	34	25	37	19	411	20	538	13	5.0	7.3
8	5.2	18	33	24	35	18	388	21	541	12	3.6	4.5
9	5.9	17	32	26	30	19	357	20	533	11	12	3.8
10	21	16	29	27	41	36	341	25	541	10	27	19
11	13	14	46	26	121	665	287	71	601	9.6	6.9	315
12	10	18	35	26	117	1310	59	58	539	8.6	4.2	18
13	341	16	32	24	124	301	45	264	525	7.9	3.6	13
14	301	30	32	23	141	462	41	700	522	7.6	3.3	13
15	53	32	35	22	135	452	33	1360	581	7.3	3.7	14
16	26	28	36	23	128	430	30	594	601	7.0	5.2	123
17	20	26	32	24	41	398	30	2560	480	6.8	4.0	100
18	1720	23	30	23	25	443	46	615	531	6.6	3.3	22
19	301	897	28	22	25	379	119	435	527	6.4	2.9	16
20	322	500	28	22	25	339	165	601	512	6.2	2.8	10
21	516	350	26	23	23	269	55	575	333	6.0	2.7	9.2
22	511	350	26	22	23	53	36	679	308	7.8	2.7	8.8
23	510	350	28	22	23	44	31	639	330	14	2.7	8.2
24	417	350	27	23	23	41	28	657	174	9.0	2.6	7.6
25	155	500	23	23	22	38	26	718	71	7.2	2.6	7.0
26	27	600	27	23	22	36	25	628	45	7.0	2.4	6.4
27	59	540	28	21	22	36	90	255	28	6.8	2.5	46
28	163	400	27	23	20	34	72	138	26	6.6	3.1	20
29	26	300	26	24	---	33	28	379	25	6.4	2.7	43
30	40	100	26	22	---	32	27	530	22	6.0	2.4	1160
31	170	---	26	22	---	30	---	530	---	5.6	2.3	---
TOTAL	5779.1	5652	1022	736	1374	6033	5117	13214	11153	315.4	150.2	2024.1
MEAN	186	188	33.0	23.7	49.1	195	171	426	372	10.2	4.85	67.5
MAX	1720	897	60	27	141	1310	716	2560	601	22	27	1160
MIN	5.2	14	23	21	20	18	25	20	22	5.6	2.3	3.4
AC-FT	11460	11210	2030	1460	2730	11970	10150	26210	22120	626	298	4010

CAL YR 1985 TOTAL 178176.9 MEAN 488 MAX 7250 MIN 1.0 AC-FT 353400  
WTR YR 1986 TOTAL 52569.6 MEAN 144 MAX 2560 MIN 2.3 AC-FT 104300

## ARKANSAS RIVER BASIN

07230597 LITTLE RIVER NEAR BOWLEGS, OK

LOCATION.--Lat 35°06'19", long 96°40'06", in NW 1/4 SE 1/4 sec.3, T.7 N., R.6 E., Seminole County, Hydrologic Unit 11090203, on the right downstream abutment of state highways 3 and 99, 6.7 miles south of Seminole and at river mile 57.8.

DRAINAGE AREA.--550 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1983 to current year.

GAGE.--Water-stage recorder and a crest stage gage. Datum of gage is 826.20 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 7-9, 25, 28, 31, Feb. 11-16, Apr. 4, 19, May 11, 30, June 6, Aug. 1, 2, 4-9, 12-31, and Sept. 1-10, 13-16, 19-26, 29. Records fair. Flow regulated by Lake Thunderbird (station 07229900) 38.8 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft<sup>3</sup>/s, Oct. 22, 1983, gage height, 24.84 ft. No flow at times in 1983, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,170 ft<sup>3</sup>/s, May 18, gage height, 21.07 ft; minimum daily discharge, 1.0 ft<sup>3</sup>/s, Oct. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	92	147	34	24	21	39	48	361	5.6	1.8	3.3
2	3.9	56	45	31	27	20	186	41	228	5.6	2.0	5.0
3	2.8	37	57	32	29	20	995	29	142	5.4	2.2	10
4	2.2	31	50	32	33	20	1200	21	307	6.2	2.1	8.0
5	1.9	27	50	29	31	18	725	19	1280	4.8	2.1	10
6	1.5	25	44	26	65	17	775	20	480	4.3	8.0	12
7	1.3	23	39	29	82	15	523	20	490	3.9	6.0	10
8	1.1	22	36	24	69	14	421	21	493	3.9	5.0	8.0
9	1.0	21	34	25	63	14	375	27	498	3.8	9.0	6.0
10	1.9	18	49	29	50	30	349	56	501	3.8	19	4.0
11	7.7	16	221	29	125	246	278	60	487	3.6	17	361
12	5.4	20	133	29	130	2310	184	67	459	3.4	10	50
13	110	28	81	28	135	626	131	114	448	3.3	9.0	20
14	575	10	37	28	138	426	109	518	443	3.2	8.0	18
15	220	45	71	28	140	398	86	2370	440	2.7	7.0	14
16	38	63	78	29	145	395	80	947	318	2.5	7.0	10
17	11	34	68	28	151	368	75	3260	276	2.4	7.0	166
18	2200	38	56	29	52	392	69	3550	400	2.4	6.0	56
19	1420	587	45	29	41	353	60	1100	321	2.3	5.0	20
20	544	305	42	27	37	298	445	547	274	2.4	4.0	16
21	526	293	45	26	32	218	222	448	289	2.3	3.0	14
22	557	280	44	24	28	144	140	451	305	2.3	2.8	12
23	536	278	44	22	26	84	98	448	328	2.2	2.6	10
24	513	276	41	21	26	63	60	473	208	2.2	2.4	8.0
25	388	278	35	22	25	56	45	479	52	2.0	2.2	7.0
26	176	426	36	23	25	48	41	462	25	2.0	2.2	6.0
27	133	454	36	22	27	44	33	356	16	1.9	2.1	18
28	130	286	37	22	24	43	103	194	9.0	1.9	2.1	34
29	128	271	36	24	---	37	83	129	7.5	1.8	2.0	11
30	133	190	35	24	---	32	52	380	6.1	1.7	2.0	788
31	110	---	36	23	---	40	---	383	---	1.6	1.9	---
TOTAL	8489.7	4530	1808	828	1780	6810	7982	17038	9891.6	97.4	162.5	1715.3
MEAN	274	151	58.3	26.7	63.6	220	266	550	330	3.14	5.24	57.2
MAX	2200	587	221	34	151	2310	1200	3550	1280	6.2	19	788
MIN	1.0	10	34	21	24	14	33	19	6.1	1.6	1.8	3.3
CAL YR 1985	TOTAL	217351.69	MEAN	595	MAX	6160	MIN	.89				
WTR YR 1986	TOTAL	61132.5	MEAN	167	MAX	3550	MIN	1.0				

## 07230597 LITTLE RIVER NEAR BOWLEGS, OK--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1953, 1959, 1961, February 1983 to current year.

REMARKS.--Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)
OCT												
18...	1330	1028	80020	20.15	3210	163	7.20	22.5	19.0	2400	750	8.1
NOV												
18...	1300	1028	80020	11.59	42	*933	7.90	21.0	18.0	43	740	8.7
DEC												
20...	1130	1028	80020	11.44	42	1230	7.80	2.0	0.5	9.8	760	15.6
JAN												
14...	1130	1028	80020	11.29	28	1300	7.90	14.0	3.5	2.9	750	13.8
FEB												
19...	1300	1028	80020	11.48	40	1060	7.80	23.0	12.5	14	740	13.3
MAR												
24...	1100	1028	80020	11.85	61	1070	7.70	19.5	14.0	60	750	10.0
31...	1500	1028	80020	11.61	40	1360	7.80	25.5	22.0	17	740	8.9
MAY												
14...	1200	1028	80020	13.38	297	593	7.70	27.5	24.0	150	740	7.7
15...	1000	1028	80020	19.32	1420	232	7.10	22.0	18.0	1300	740	8.0
16...	1300	1028	80020	15.60	988	341	7.60	26.0	22.5	550	740	7.4
19...	1400	1028	80020	15.50	994	334	7.40	23.0	20.0	380	750	7.5
JUN												
23...	1500	1028	80020	13.41	313	480	7.80	28.0	28.0	63	750	7.6
AUG												
04...	1400	1028	80020	10.89	2.2	3430	8.20	29.0	30.0	0.80	740	8.7
SEP												
30...	1430	1028	80020	14.93	769	333	7.20	22.0	22.5	1900	740	6.6

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)
OCT												
18...	89	48	5	11	5.0	11	32	0.7	2.2	52	0	43
NOV												
18...	95	300	72	65	33	78	36	2	3.1	276	0	226
DEC												
20...	109	350	72	77	39	110	40	3	2.5	343	0	281
JAN												
14...	106	380	64	78	45	130	43	3	1.6	386	0	316
FEB												
19...	129	300	52	64	35	90	39	2	2.9	307	0	252
MAR												
24...	99	310	46	68	35	84	36	2	3.7	327	0	268
31...	105	360	53	72	44	130	44	3	2.9	376	0	308
MAY												
14...	95	190	4	40	21	29	25	1	3.3	222	0	182
15...	87	73	2	17	7.3	13	27	0.7	3.0	86	0	70
16...	88	110	4	25	12	21	28	0.9	3.7	131	0	108
19...	84	110	7	26	11	21	29	0.9	3.4	126	0	103
JUN												
23...	99	190	16	40	22	27	23	0.9	3.0	212	0	174
AUG												
04...	120	600	390	90	90	470	63	9	4.3	255	0	209
SEP												
30...	79	70	0	16	7.2	24	42	1	2.9	--	--	--

\* SPECIFIC CONDUCTANCE, LAB (US/CM)

## ARKANSAS RIVER BASIN

07230597 LITTLE RIVER NEAR BOWLEGS, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)
OCT												
18...	5.2	9.0	17	0.20	5.0	89	86	0.12	771	--	--	--
NOV												
18...	5.5	25	160	0.30	13	506	510	0.69	57	<0.100	0.60	--
DEC												
20...	8.6	19	230	0.30	12	665	660	0.90	75	<0.100	0.30	--
JAN												
14...	7.7	34	240	0.20	12	1120	730	1.5	85	<0.100	0.30	--
FEB												
19...	7.7	21	180	0.30	7.4	570	550	0.78	61	<0.100	0.40	--
MAR												
24...	10	39	180	0.30	8.6	593	580	0.81	98	<0.100	0.90	--
31...	9.5	42	240	0.40	11	730	730	0.99	78	<0.100	0.60	--
MAY												
14...	7.0	14	48	0.30	3.5	274	270	0.37	220	0.100	0.70	0.80
15...	11	12	14	0.20	4.7	144	110	0.20	552	0.300	2.2	2.5
16...	5.2	11	32	0.20	5.9	190	180	0.26	507	0.200	1.3	1.5
19...	8.0	11	35	0.20	6.5	187	180	0.25	502	0.100	1.0	1.1
JUN												
23...	5.3	12	40	0.30	4.9	248	250	0.34	210	0.400	--	--
AUG												
04...	2.6	100	930	0.30	1.8	1940	1800	2.6	12	<0.100	0.60	--
SEP												
30...	10	7.9	35	0.20	5.6	--	150	0.20	311	0.100	0.90	1.0

DATE	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	BORON, DIS- SOLVED (UG/L AS B)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT											
18...	--	--	--	50	120	35	16	0.30	3770	32700	78
NOV											
18...	--	0.050	0.15	140	460	2	19	0.20	78	8.8	85
DEC											
20...	--	0.020	0.06	160	8	1	60	0.20	26	2.9	79
JAN											
14...	--	0.010	--	220	6	2	49	<0.10	6	0.45	93
FEB											
19...	--	0.020	--	200	12	1	11	0.10	21	2.3	93
MAR											
24...	--	0.070	--	170	20	7	19	0.20	82	13	93
31...	--	0.030	--	250	10	4	14	0.20	36	3.8	96
MAY											
14...	3.5	0.100	--	100	12	3	3	0.20	474	380	69
15...	11	0.310	--	60	150	30	12	0.60	2980	11400	84
16...	6.6	0.210	--	90	95	15	5	0.20	1600	4270	58
19...	4.9	0.170	--	70	76	20	15	0.20	685	1840	69
JUN											
23...	--	0.080	--	100	18	6	13	0.90	939	794	16
AUG											
04...	--	0.010	--	610	10	<5	20	0.30	4	0.02	38
SEP											
30...	4.4	0.040	--	70	160	38	9	--	1820	3780	100



## ARKANSAS RIVER BASIN

139

## 07231000 LITTLE RIVER NEAR SASAKWA, OK

LOCATION.--Lat 34°59'02", long 96°33'01", NE 1/4 sec.22, T.6 N., R.7 E., Seminole County, Hydrologic Unit 11090203, near left abutment on downstream side of county road bridge, 2.8 mi northwest of Sasakwa, 8.7 mi downstream from Salt Creek, and at mile 24.1.

DRAINAGE AREA.--865 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1942 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 744.34 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Apr. 11, 1946, nonrecording gage at same site and datum. Prior to Oct. 1, 1979, gage at same site and datum, 4.87 ft higher.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by Lake Thunderbird (station 07229900) 72.3 mi upstream since March 1965.

AVERAGE DISCHARGE.--(Prior to regulation by Lake Thunderbird) 23 years (water years 1943-65), 398 ft<sup>3</sup>/s, 288,400 acre-ft/yr; (since regulation by Lake Thunderbird) 21 years (water years 1966-86), 283 ft<sup>3</sup>/s, 205,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,600 ft<sup>3</sup>/s, May 11, 1950, gage height, 33.48 ft; no flow at times most years after 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,400 ft<sup>3</sup>/s, Oct. 18, gage height, 21.49 ft; minimum daily discharge, 1.2 ft<sup>3</sup>/s, Aug. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	89	274	722	77	53	55	40	534	600	64	3.2	3.2
2	132	170	308	76	55	53	250	130	598	57	14	3.1
3	162	101	184	74	61	52	1430	49	472	53	7.8	3.3
4	70	76	145	73	64	54	5580	29	409	59	5.3	4.6
5	74	56	127	69	66	54	4080	20	1590	64	6.9	11
6	48	56	115	63	102	50	1890	19	2210	51	15	32
7	47	54	97	58	125	51	1230	16	963	46	20	25
8	41	53	92	51	133	51	787	22	788	42	13	16
9	38	52	324	43	115	53	619	15	1050	39	14	13
10	40	50	1460	51	98	69	517	449	719	35	15	12
11	46	49	956	59	69	116	444	444	829	32	17	215
12	68	49	580	62	146	1720	390	169	698	29	42	405
13	93	52	351	61	239	1980	175	108	585	26	20	96
14	585	59	232	60	238	894	110	268	548	23	11	42
15	667	91	209	59	275	822	78	3000	535	21	7.0	27
16	278	101	196	59	308	870	59	2190	859	18	8.0	438
17	123	97	176	60	275	680	46	4960	1390	16	6.6	117
18	3560	847	160	60	162	832	44	4200	685	12	6.3	197
19	3460	1110	134	60	98	807	130	3710	609	11	6.3	97
20	1600	1060	124	59	83	580	721	1740	553	8.7	5.6	39
21	751	445	115	58	72	514	431	1140	519	7.3	4.6	20
22	681	417	112	59	65	413	177	940	402	7.5	3.8	11
23	656	415	109	61	61	193	99	888	448	7.0	3.3	8.0
24	596	410	104	55	60	133	63	813	916	5.8	2.9	6.7
25	490	408	96	55	59	108	44	789	386	5.6	2.5	5.5
26	368	493	83	53	59	90	32	822	244	5.8	2.2	5.1
27	199	659	78	52	57	74	32	769	161	5.6	1.8	5.1
28	1120	546	78	52	55	62	49	572	127	4.8	1.8	10
29	1060	366	77	56	---	51	94	338	97	4.4	1.6	59
30	334	493	82	54	---	39	36	485	77	3.8	1.2	864
31	165	---	82	54	---	31	---	595	---	3.2	1.4	---
TOTAL	17641	9109	7708	1843	3253	11551	19677	30223	20067	767.5	271.1	2790.6
MEAN	569	304	249	59.5	116	373	656	975	669	24.8	8.75	93.0
MAX	3560	1110	1460	77	308	1980	5580	4960	2210	64	42	864
MIN	38	49	77	43	53	31	32	15	77	3.2	1.2	3.1
AC-FT	34990	18070	15290	3660	6450	22910	39030	59950	39800	1520	538	5540
CAL YR 1985	TOTAL	349234.30		MEAN	957	MAX	15600	MIN	.90	AC-FT	692700	
WTR YR 1986	TOTAL	124901.2		MEAN	342	MAX	5580	MIN	1.2	AC-FT	247700	

## ARKANSAS RIVER BASIN

07231000 LITTLE RIVER NEAR SASAKWA, OK--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1955 to April 1982.

WATER TEMPERATURE: October 1955 to April 1982.

REMARKS.--Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

		AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CAC03)	
OCT													
31...	1330	1028	80020	153	1030	7.80	12.5	13.0	730	10.4	103	220	
NOV													
19...	1200	1028	80020	1380	331	7.20	16.0	16.0	750	7.5	77	83	
DEC													
18...	1230	1028	80020	148	1330	7.70	4.5	2.0	760	14.0	102	330	
JAN													
15...	1200	1028	80020	57	2040	8.00	13.0	3.5	750	13.6	105	480	
FEB													
20...	1100	1028	80020	83	1540	7.80	8.5	12.0	740	11.2	108	350	
MAR													
21...	1430	1028	80020	506	705	7.70	15.0	11.0	760	10.7	97	220	
APR													
03...	1300	1028	80020	812	749	7.20	21.5	17.5	740	7.1	77	180	
MAY													
28...	1330	1028	80020	550	800	7.70	21.0	23.0	740	7.3	88	230	
JUN													
26...	0930	1028	80020	249	776	7.70	25.0	27.0	750	6.6	84	190	
AUG													
07...	1000	1028	80020	18	2290	7.80	30.0	27.5	750	8.0	104	410	
SEP													
29...	1500	1028	80020	49	1450	7.90	27.5	27.0	740	7.8	101	290	
DATE		HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HC03)	CAR- BONATE IT-FLD (MG/L AS C03)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)
OCT													
31...	89	51	22	110	--	3	--	159	0	130	4.0	--	
NOV													
19...	6	22	6.7	34	45	2	7.3	--	--	--	9.4	24	
DEC													
18...	100	76	35	140	--	3	--	285	0	234	9.0	--	
JAN													
15...	150	100	55	230	--	5	--	400	0	328	6.4	--	
FEB													
20...	110	75	40	160	--	4	--	293	0	240	7.4	--	
MAR													
21...	38	49	24	57	--	2	--	224	0	184	7.1	--	
APR													
03...	44	39	19	76	--	3	--	161	0	132	16	--	
MAY													
28...	47	50	25	72	40	2	3.2	222	0	182	7.0	15	
JUN													
26...	37	43	19	71	--	2	--	181	0	149	5.7	--	
AUG													
07...	240	78	49	310	63	7	4.6	205	0	168	5.2	--	
SEP													
29...	97	61	34	170	--	4	--	239	0	196	4.8	--	

## ARKANSAS RIVER BASIN

07231000 LITTLE RIVER NEAR SASAKWA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CHLORIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHROMIUM, DIS- SOLVED (UG/L AS CR)
OCT 31...	--	7.8	--	--	--	--	<1	240	<0.5	<1	<10
NOV 19...	58	6.5	202	210	0.27	753	<1	52	<0.5	<1	60
DEC 18...	--	9.3	--	--	--	--	<1	270	<0.5	<1	<10
JAN 15...	--	10	--	--	--	--	1	460	<0.5	<1	<10
FEB 20...	--	5.0	--	--	--	--	<1	350	<0.5	<1	<10
MAR 21...	--	5.0	--	--	--	--	<1	250	<0.5	2	<10
APR 03...	--	8.3	--	--	--	--	<1	160	<0.5	<1	<10
MAY 28...	140	5.9	439	420	0.60	652	<1	260	<0.5	2	<10
JUN 26...	--	6.1	--	--	--	--	<1	200	<0.5	<1	<10
AUG 07...	--	4.5	--	--	--	--	<1	440	4	9	--
SEP 29...	--	7.5	--	--	--	--	1	430	<0.5	<1	<10

DATE	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGANESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYBDENUM, DIS- SOLVED (UG/L AS MO)	STRONTIUM, DIS- SOLVED (UG/L AS SR)	VANADIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 31...	<3	20	47	<10	11	19	--	<10	520	<6	12
NOV 19...	<3	<10	290	<10	<4	37	0.3	<10	150	<6	26
DEC 18...	<3	10	8	<10	13	53	<0.1	<10	740	<6	6
JAN 15...	<3	10	11	<10	21	170	0.1	<10	1200	<6	25
FEB 20...	<3	<10	6	<10	14	45	--	<10	960	<6	9
MAR 21...	<3	10	16	<10	8	8	<0.1	<10	430	<6	14
APR 03...	<3	10	130	<10	9	4	<0.1	<10	410	<6	11
MAY 28...	<3	10	21	<10	9	7	<0.1	<10	490	<6	23
JUN 26...	<3	<10	10	<10	10	2	0.1	<10	460	<6	3
AUG 07...	<9	30	10	<30	20	11	0.1	<30	13000	<18	15
SEP 29...	<3	<10	5	<10	16	2	<0.1	<10	590	<6	7

## 07231500 CANADIAN RIVER AT CALVIN, OK

LOCATION.--Lat 34°58'32", long 96°14'24", in NE 1/4 SW 1/4 sec.22, T.6 N., R.10 E., Hughes County, Hydrologic Unit 11090202, near left bank on downstream side of pier of bridge on old U.S. Highway 75, 0.5 mi northeast of Calvin, 2.4 mi upstream from Shawnee Creek, 8.5 mi downstream from Little River, and at mile 93.9.

DRAINAGE AREA.--27,952 mi<sup>2</sup>, of which 4,801 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1905 to December 1908 (gage heights and discharge measurements only, except for period July 1905 to December 1906), October 1938 to September 1942, July 1944 to current year. Monthly discharge only for some periods, published in WSP 1311. Gage-height records collected in this vicinity since 1904 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 1341: Drainage area. WSP 1391: 1941.

GAGE.--Water-stage recorder and nonrecording gage. Datum of gage is 682.72 ft, National Geodetic Vertical Datum of 1929. January 1905 to December 1908, nonrecording gage at site 0.8 mi upstream at datum 4.00 ft higher. Oct. 1, 1938 to Aug. 12, 1944, nonrecording gage at present site and datum. Aug. 13, 1944 to July 31, 1977, water-stage recorder at present site and datum 2.00 ft higher.

REMARKS.--Estimated daily discharges: Dec. 15, Jan. 8-9, Feb. 10-13, May 14, and July 17 to Aug. 4. Records good. Occasional slight regulation by dams in New Mexico and Texas since 1964.

AVERAGE DISCHARGE.--47 years (water years 1906, 1939-42, 1945-86), 1,569 ft<sup>3</sup>/s, 1,137,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 174,000 ft<sup>3</sup>/s May 11, 1950, gage height, 17.35 ft, maximum gage height, 21.00 ft, Aug. 7, 1906, from floodmark, site and datum then in use; no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 25,000 ft<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. 18	1330	*50,200	*9.75	May 18	0230	33,000	8.17
Apr. 4	0530	31,800	8.04	Sept. 30	--	46,600	9.45
May 15	1930	40,100	8.86				

Minimum daily discharge 80 ft<sup>3</sup>/s, July 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	956	972	4700	533	379	421	507	3600	1860	294	90	179
2	735	948	1950	547	406	435	527	3410	2060	250	88	183
3	466	608	999	537	437	421	3180	1220	1870	219	90	172
4	333	449	686	495	463	406	24100	737	1350	195	88	217
5	227	364	533	517	451	387	16100	553	13300	187	86	334
6	188	300	480	505	1180	382	6630	435	17000	174	193	466
7	152	259	506	487	1050	375	4840	380	6940	129	111	502
8	125	221	497	430	1070	388	3040	355	3880	111	119	389
9	112	202	485	420	954	396	2310	336	5380	104	153	399
10	111	191	3760	432	740	415	1990	693	4860	109	203	342
11	121	188	8530	426	650	480	1770	2800	2660	86	402	844
12	144	198	3390	442	640	8800	1640	5080	6390	86	361	1700
13	265	177	1440	470	700	7630	1300	4490	3230	116	500	1760
14	435	178	1000	476	903	3430	720	1250	1830	221	413	726
15	5750	721	700	462	961	2230	571	22700	1370	212	299	553
16	3170	3490	752	453	983	2750	468	24700	5560	137	258	1720
17	1680	3560	731	454	907	2210	413	22000	14000	110	212	3160
18	26100	2990	705	497	844	2920	395	30900	8060	96	199	1540
19	25100	9720	664	513	625	4010	545	19400	3810	80	280	760
20	11800	6260	610	537	562	2390	2180	8340	2210	95	324	526
21	3760	2440	636	526	840	1500	3960	3590	1300	120	274	651
22	2200	1370	652	462	685	1090	2260	2850	826	110	347	581
23	2200	1080	675	441	615	772	1170	3460	648	100	265	473
24	2060	900	640	416	545	610	731	3310	1970	96	230	355
25	1830	841	659	400	520	517	566	3130	2730	94	191	285
26	1650	807	680	430	478	483	499	3250	3430	92	191	274
27	1220	1130	700	423	438	499	485	3400	739	90	183	330
28	799	1400	724	411	420	491	485	3350	550	90	172	526
29	7470	974	705	396	---	491	484	2250	445	89	159	760
30	4110	1070	668	382	---	526	917	1450	357	92	159	21500
31	1490	---	575	370	---	526	---	1710	---	90	168	---
TOTAL	106759	44008	40432	14290	19446	48381	84783	185129	120615	4074	6808	42207
MEAN	3444	1467	1304	461	694	1561	2826	5972	4020	131	220	1407
MAX	26100	9720	8530	547	1180	8800	24100	30900	17000	294	500	21500
MIN	111	177	480	370	379	375	395	336	357	80	86	172
AC-FT	211800	87290	80200	28340	38570	95960	168200	367200	239200	8080	13500	83720

CAL YR 1985 TOTAL 1476450 MEAN 4045 MAX 52100 MIN 13 AC-FT 2929000  
WTR YR 1986 TOTAL 716932 MEAN 1964 MAX 30900 MIN 80 AC-FT 1422000

## ARKANSAS RIVER BASIN

143

07231500 CANADIAN RIVER AT CALVIN, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-53, 1960-61, 1965 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1965 to January 1982.

WATER TEMPERATURE: July 1965 to January 1982.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

										BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	
DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)			
OCT 17...	1230	1028	80020	1630	863	7.70	25.0	17.5	600	750	8.9	95
DEC 17...	1230	1028	80020	761	1230	7.70	8.0	2.5	25	750	13.0	97
FEB 25...	1300	1028	80020	533	1660	8.00	13.0	12.0	11	750	12.8	121
APR 01...	1100	1028	80020	496	1520	8.00	17.0	18.0	22	750	9.4	101
MAY 21...	1515	1028	1028	3260	556	7.70	26.0	24.0	--	--	--	--
JUN 24...	1100	1028	80020	1390	813	7.80	27.0	30.0	1.0	750	6.8	92
AUG 05...	1200	1028	80020	86	1590	7.90	24.0	26.0	2.5	750	8.4	106
DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS./100 ML)	HARD-NESS (MG/L AS CAC03)	HARD-NESS NONCARB WH TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE IT-FLD (MG/L AS HC03)	CAR-BONATE IT-FLD (MG/L AS C03)
OCT 17...	1200	1300	200	86	48	20	82	46	3	4.8	141	0
DEC 17...	240	200	360	79	88	33	120	42	3	4.1	339	0
FEB 25...	K5	K3	460	180	110	45	170	44	4	4.4	346	0
APR 01...	99	110	380	150	82	42	150	46	3	4.3	283	0
MAY 21...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 24...	2500	K12000	240	65	58	24	66	37	2	4.8	218	0
AUG 05...	370	2900	320	130	47	50	210	58	5	7.4	232	0
DATE	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS-SOLVED (MG/L AS C02)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS NO3)
OCT 17...	116	4.5	100	120	0.50	8.4	478	460	0.65	2100	0.380	1.7
DEC 17...	278	11	--	--	--	12	--	--	--	--	0.490	2.2
FEB 25...	284	5.5	230	280	0.80	7.6	1020	1000	1.4	1470	--	--
APR 01...	232	4.5	150	250	0.60	6.6	847	830	1.2	1130	--	--
MAY 21...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 24...	179	5.5	52	100	0.30	7.5	397	420	0.54	1490	--	--
AUG 05...	190	4.6	200	300	0.50	9.2	993	940	1.4	231	--	--

## ARKANSAS RIVER BASIN

07231500 CANADIAN RIVER AT CALVIN, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS P04)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)
OCT 17...	0.070	0.23	0.450	0.880	0.300	0.39	1.8	2.7	0.650	2.0	0.070	0.070
DEC 17...	0.010	0.03	0.500	0.410	0.400	0.52	0.49	0.90	0.150	0.46	0.100	0.100
FEB 25...	0.010	0.03	<0.100	0.040	0.010	0.01	0.86	0.90	0.170	--	0.090	0.070
APR 01...	<0.010	--	<0.100	0.050	0.040	0.05	0.85	0.90	0.180	--	0.040	0.030
MAY 21...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 24...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 05...	<0.010	--	<0.100	0.060	0.030	0.04	1.9	2.0	0.200	--	0.010	<0.010

DATE	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
OCT 17...	0.21	--	--	--	--	--	--	--	--	--	--	--
DEC 17...	0.31	30	--	310	<0.5	<1	<1	<3	4	8	<1	23
FEB 25...	0.21	--	--	--	--	--	--	--	--	--	--	--
APR 01...	0.09	20	3	290	<0.5	<1	<1	<3	3	7	1	29
MAY 21...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 24...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 05...	--	<10	5	260	<0.5	1	<1	<3	1	7	<5	30

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SED. SUSP. CHARGE, SUS- PENDE (T/DAY)	SED. SIEVE DIAM. % FINER THAN .062 MM
OCT 17...	--	--	--	--	--	--	--	--	--	2860	12600	32
DEC 17...	37	--	<10	3	<1	<1	890	<6	7	690	1420	17
FEB 25...	--	--	--	--	--	--	--	--	--	1340	1930	3
APR 01...	12	<0.1	<10	<1	<1	<1	1000	8	9	80	107	44
MAY 21...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 24...	--	--	--	--	--	--	--	--	--	2100	7880	28
AUG 05...	1	0.1	<10	2	<1	<1	940	7	5	53	12	42



# ARKANSAS RIVER BASIN

145

07232500 BEAVER RIVER NEAR GUYMON, OK  
(Headwater of the North Canadian River)

LOCATION.--Lat 36°43'24", long 101°29'30", NW 1/4 SW 1/4 sec.18, T.3 N., R.15 E., Texas County, Hydrologic Unit 11100101, near center of span on downstream side of pier of bridge on U.S. Highway 64 at Dry Sand Draw, 1.2 mi upstream from Goff Creek, 2.5 mi north of Guymon, and at mile 650.7.

DRAINAGE AREA.--2,139 mi<sup>2</sup>, which includes that of Dry Sand Draw and of which 964 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311. Prior to October 1970, published as North Canadian River near Guymon.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,970.69 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 15-21, Jan. 8-10, Feb. 7-16, 21, 22. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--49 years, 21.5 ft<sup>3</sup>/s, 15,580 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,400 ft<sup>3</sup>/s, June 15, 1964, gage height, 13.68 ft; maximum gage height, 13.82 ft, Sept 23, 1941, from floodmark; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,400 ft<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)
Dec. 8	1245	*21	4.81				
Jan. 10	1215	ice jam	*5.07				

No peaks greater than base discharge

No flow most days.

## DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986 MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.72	.27	1.6	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.54	.40	1.4	.77	.00	.00	.00	.00	.00
3	.00	.00	.00	.94	.59	1.3	1.8	.00	.00	.00	.00	.00
4	.00	.00	.00	.72	.53	1.5	1.1	.00	.00	.00	.00	.00
5	.00	.00	.03	.62	.30	1.4	.70	.00	.00	.00	.00	.00
6	.00	.00	.22	1.2	.28	1.4	.52	.00	.00	.00	.00	.00
7	.00	.00	.68	.00	.26	1.3	.51	.00	.00	.00	.00	.00
8	.00	.00	.67	.49	.17	1.7	.26	.00	.00	.00	.00	.00
9	.00	.00	.14	.84	.27	1.6	.55	.00	.00	.00	.00	.00
10	.39	.00	.00	1.2	.23	1.8	.90	.00	.00	.00	.00	.00
11	.21	.00	.00	1.4	.19	1.8	1.0	.00	.00	.00	.00	.00
12	.00	.00	.00	.98	.31	1.5	.96	.00	.00	.00	.00	.00
13	.00	.00	.00	1.4	.52	1.5	.72	.00	.00	.00	.00	.00
14	.00	.00	.00	1.2	.80	1.8	.00	.00	.00	.00	.01	.00
15	.00	.00	.51	1.5	1.4	2.2	.00	.00	.00	.00	.00	.00
16	.00	.00	.73	.77	2.5	2.1	.00	.00	.00	.00	.00	.00
17	.00	.00	.89	.76	2.3	2.0	.25	.00	.00	.00	.00	.00
18	.00	.00	.79	.49	2.0	1.6	.00	.00	.00	.00	.00	.00
19	.00	.00	.74	1.0	1.8	1.9	.00	.00	.00	.00	.00	.00
20	.00	.00	.82	.83	.86	2.3	.00	.00	.00	.05	.00	.00
21	.00	.00	.65	.16	.77	1.9	.00	.00	.00	.00	.00	.00
22	.00	.00	.48	.61	.88	1.7	.00	.00	.00	.00	.00	.00
23	.00	.00	.65	.93	1.2	.99	.00	.00	.00	.00	.00	.00
24	.00	.00	.42	.54	.84	.84	.00	.00	.00	.00	.00	.00
25	.00	.00	.79	.27	.77	.59	.00	.00	.00	.00	.00	.00
26	.00	.00	.65	1.0	1.5	.15	.00	.00	.00	.00	.00	.00
27	.00	.00	.33	1.2	1.1	.40	.00	.00	.00	.00	.00	.00
28	.00	.00	.63	1.2	1.3	.50	.00	.00	.00	.00	.00	.00
29	.00	.00	.57	.52	---	.48	.00	.00	.00	.00	.00	.00
30	.00	.00	.77	.61	---	.13	.00	.00	.00	.00	.00	.00
31	.00	---	.24	.48	---	.30	---	.00	---	.00	.00	---
TOTAL	.60	.00	12.40	25.12	24.34	41.68	10.04	.00	.00	.05	.01	.00
MEAN	.019	.000	.40	.81	.87	1.34	.33	.000	.000	.002	.000	.000
MAX	.39	.00	.89	1.5	2.5	2.3	1.8	.00	.00	.05	.01	.00
MIN	.00	.00	.00	.00	.17	.13	.00	.00	.00	.00	.00	.00
AC-FT	1.2	.00	25	50	48	83	20	.00	.00	.10	.02	.00

CAL YR 1985 TOTAL 221.54 MEAN .61 MAX 113 MIN .00 AC-FT 439  
WTR YR 1986 TOTAL 114.24 MEAN .31 MAX 2.5 MIN .00 AC-FT 227

## ARKANSAS RIVER BASIN

07232900 COLDWATER CREEK NR GUYMON, OK

LOCATION.--Lat 36°34'19", long 101°22'52", NW 1/4 NW 1/4 sec.7, T.1 N., R.16 E., Texas County, Hydrologic Unit 11100103, near left bank on downstream side of pier of bridge on county road, 0.3 mi downstream from Frisco Creek, 4.0 mi east and 7.5 mi south of Guymon, and at mile 18.0.

DRAINAGE AREA.--1,903 mi<sup>2</sup>, of which 1,178 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1980 to current year.

GAGE.--Water-stage recorder. Datum of gage 2,870.83 ft; National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--6 years, 2.10 ft<sup>3</sup>/s, 1,520 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,800 ft<sup>3</sup>/s, June 20, 1982, gage height, 14.34 ft; no flow each year.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base discharge of 300 ft<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. 10	1815	*575	*12.05	No other peak greater than base discharge.			
No flow most days.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.95	.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	16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	399	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	194	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.58	.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	652.53	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MEAN	21.0	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
MAX	399	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	1290	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
CAL YR 1985	TOTAL 1478.04	MEAN 4.05	MAX 399	MIN .00	AC-FT 2930							
WTR YR 1986	TOTAL 652.53	MEAN 1.79	MAX 399	MIN .00	AC-FT 1290							

## ARKANSAS RIVER BASIN

147

## 07233200 OPTIMA LAKE NEAR HARDESTY, OK

LOCATION.--Lat 36°39'23", long 101°08'13", in NE 1/4 NE 1/4 sec.8, T.2 N., R.18 E., Texas County, Hydrologic Unit 11100102, in control tower for dam on Beaver River, 4.5 mi northeast of Hardesty, and at mile 623.2.

DRAINAGE AREA.--5,029 mi<sup>2</sup>, of which 2,688 mi<sup>2</sup> (corrected) is probably noncontributing.

PERIOD OF RECORD.--October 1978 to current year.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Reservoir is formed by earth dam having a concrete gate tower with a 12- by 16-foot, 5-inch oblong conduit. Discharges are controlled by two drum-hoist operated tractor-type service gates and a 36-inch low-flow control pipe. Closure for storage was made Oct. 2, 1978. Capacity, 618,500 acre-ft at elevation 2,814.2 ft, maximum pool; 382,500 acre-ft at elevation 2,796.0 ft, uncontrolled spillway crest; 229,500 acre-ft at elevation 2,779.0 ft, top of flood-control pool; 129,000 acre-ft at elevation 2,763.5 ft, top of conservation pool. Figures given herein represent total contents. Reservoir is used for flood control, sediment control, and water supply. Capacity table based on original survey.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 7,610 acre-ft, May 30 to June 2, 1980, elevation, 2,722.90 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 3,010 acre-ft, Oct. 15-19, elevation, 2,717.85 ft; minimum, 1,390 acre-ft, Sept. 25-30, elevation, 2,714.90 ft.

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

2,714	1,060	2,717	2,450
2,715	1,430	2,718	3,110
2,716	1,890	2,719	3,870

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1820	2910	2880	2850	2850	2810	2780	2520	2340	2250	1800	1610
2	1820	2910	2880	2850	2850	2810	2780	2520	2340	2230	1750	1590
3	1840	2910	2880	2850	2850	2810	2780	2480	2340	2200	1750	1570
4	1840	2910	2880	2850	2850	2810	2780	2450	2340	2140	1730	1550
5	1870	2910	2880	2850	2850	2810	2780	2450	2340	2200	1710	1550
6	1870	2910	2880	2850	2850	2810	2750	2420	2310	2230	1680	1520
7	1870	2910	2850	2850	2850	2810	2750	2420	2310	2230	1680	1520
8	1920	2880	2850	2850	2850	2810	2750	2390	2340	2200	1660	1520
9	2030	2880	2850	2850	2850	2810	2750	2390	2370	2170	1640	1500
10	2170	2880	2850	2850	2850	2810	2750	2390	2390	2170	1590	1500
11	2550	2880	2850	2850	2850	2810	2750	2370	2390	2140	1570	1500
12	2880	2880	2850	2850	2850	2810	2750	2370	2370	2140	1570	1480
13	2950	2880	2850	2850	2850	2810	2710	2340	2370	2140	1570	1480
14	2980	2880	2850	2850	2850	2810	2710	2340	2370	2110	1570	1480
15	3010	2880	2850	2850	2850	2810	2710	2340	2370	2090	1750	1450
16	3010	2880	2850	2850	2850	2810	2710	2340	2370	2060	1800	1450
17	3010	2880	2850	2850	2850	2810	2710	2340	2370	2060	1800	1450
18	3010	2880	2850	2850	2850	2810	2710	2310	2370	2030	1780	1430
19	3010	2880	2850	2850	2850	2810	2710	2310	2370	1970	1750	1430
20	2980	2880	2850	2850	2850	2810	2710	2280	2340	1970	1730	1430
21	2980	2880	2850	2850	2850	2810	2680	2280	2310	1970	1730	1410
22	2980	2880	2850	2850	2850	2810	2680	2280	2310	1950	1710	1410
23	2950	2880	2850	2850	2850	2810	2650	2250	2310	1920	1710	1410
24	2950	2880	2850	2850	2850	2810	2650	2250	2280	1920	1680	1410
25	2950	2880	2850	2850	2850	2810	2620	2250	2280	1890	1680	1390
26	2950	2880	2850	2850	2810	2810	2580	2280	2280	1920	1660	1390
27	2950	2880	2850	2850	2810	2810	2580	2280	2280	1920	1640	1390
28	2950	2880	2850	2850	2810	2810	2580	2310	2250	1890	1610	1390
29	2910	2880	2850	2850	---	2810	2550	2310	2250	1870	1610	1390
30	2910	2880	2850	2850	---	2780	2550	2280	2250	1840	1610	1390
31	2910	---	2850	2850	---	2780	---	2310	---	1840	1610	---
MAX	3010	2910	2880	2850	2850	2810	2780	2520	2390	2250	1800	1610
MIN	1820	2880	2850	2850	2810	2780	2550	2250	2250	1840	1570	1390
(+)	2717.70	2717.65	2717.60	2717.60	2717.55	2717.50	2717.15	2716.75	2716.65	2715.90	2715.40	2714.90
(++)	+1,110	-30	-30	0	-40	-30	-230	-240	-60	-410	-230	-220
CAL YR 1985	MAX	3010	MIN	1130	(++)	+1,480						
WTR YR 1986	MAX	3010	MIN	1390	(++)	-410						

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

## ARKANSAS RIVER BASIN

07233210 BEAVER RIVER NEAR HARDESTY, OK  
(Headwater of the North Canadian River)

LOCATION.--Lat 36°39'23", long 101°08'06", in SE 1/4 NE 1/4 sec.8, T.2 N., R.18 E., Texas County, Hydrologic Unit 11100102, on left bank of outlet channel, 500 ft downstream from Optima Dam, 5 mi northeast of Hardesty, and at mile 623.1.

DRAINAGE AREA.--5,029 mi<sup>2</sup>, of which 2,688 mi<sup>2</sup> (corrected) is probably noncontributing.

PERIOD OF RECORD.--October 1977 to September 1986 (discontinued).

GAGE.--Water-stage recorder. Datum of gage 2,690.00 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records poor. Flow completely regulated by Optima Lake (07233200) since October 1978. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--(Since regulation by Optima Lake) 8 years (water years 1979-86) 0.11 ft<sup>3</sup>/s, 79.7 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 685 ft<sup>3</sup>/s June 8, 1978, gage height, 10.42 ft; no flow at times in 1978, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3.2 ft<sup>3</sup>/s, July 5, gage height, 8.50 ft; minimum daily discharge, 0.04 ft<sup>3</sup>/s, several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.09	.16	.10	.08	.06	.06	.05	.07	.21	.20	.14	.20
2	.08	.13	.09	.09	.05	.06	.07	.06	.16	.18	.13	.21
3	.08	.11	.09	.08	.05	.05	.07	.07	.12	.17	.14	.21
4	.09	.11	.09	.09	.05	.05	.06	.07	.10	.15	.14	.19
5	.08	.11	.10	.08	.05	.05	.05	.07	.10	.17	.13	.19
6	.08	.10	.10	.08	.04	.05	.05	.07	.09	.82	.14	.19
7	.09	.10	.10	.08	.04	.05	.04	.07	.10	.27	.13	.18
8	.10	.10	.09	.07	.04	.04	.05	.07	.10	.19	.31	.18
9	.43	.10	.09	.07	.05	.05	.05	.07	.44	.17	.24	.17
10	.21	.10	.09	.08	.04	.05	.05	.07	.22	.17	.20	.17
11	.12	.10	.08	.07	.04	.06	.06	.07	.17	.33	.17	.17
12	.12	.10	.08	.07	.04	.06	.06	.06	.15	.18	.15	.16
13	.11	.10	.09	.07	.05	.05	.06	.07	.15	.16	.16	.16
14	.11	.09	.10	.07	.05	.05	.06	.14	.16	.15	.31	.16
15	.11	.10	.10	.08	.05	.05	.06	.10	.57	.15	.59	.17
16	.11	.10	.09	.09	.04	.08	.07	.08	.41	.14	.36	.17
17	.11	.10	.09	.08	.04	.07	.07	.08	.26	.14	.35	.20
18	.12	.09	.09	.08	.05	.07	.06	.07	.23	.13	.24	.18
19	.12	.08	.09	.08	.05	.06	.06	.07	.23	.13	.19	.17
20	.12	.09	.09	.08	.05	.06	.06	.07	.22	.13	.18	.17
21	.13	.09	.09	.07	.05	.05	.06	.07	.20	.15	.17	.17
22	.15	.09	.08	.07	.05	.05	.06	.07	.31	.14	.18	.17
23	.16	.10	.09	.07	.05	.06	.06	.07	.33	.14	.18	.23
24	.15	.09	.09	.07	.04	.05	.06	.06	.39	.13	.21	.18
25	.14	.09	.08	.07	.05	.05	.06	.06	.33	.14	.18	.15
26	.15	.10	.08	.07	.05	.05	.07	.11	.18	.17	.17	.13
27	.15	.10	.08	.06	.05	.05	.10	.10	.17	.14	.17	.13
28	.18	.10	.08	.06	.05	.05	.08	.08	.17	.14	.17	.15
29	.21	.09	.07	.05	---	.06	.07	.08	.16	.13	.18	.16
30	.20	.09	.08	.05	---	.06	.07	.07	.16	.12	.24	.18
31	.19	---	.08	.06	---	.06	---	.09	---	.13	.26	---
TOTAL	4.29	3.01	2.74	2.27	1.32	1.71	1.85	2.36	6.59	5.66	6.51	5.25
MEAN	.14	.10	.088	.073	.047	.055	.062	.076	.22	.18	.21	.17
MAX	.43	.16	.10	.09	.06	.08	.10	.14	.57	.82	.59	.23
MIN	.08	.08	.07	.05	.04	.04	.04	.06	.09	.12	.13	.13
AC-FT	8.5	6.0	5.4	4.5	2.6	3.4	3.7	4.7	13	11	13	10

CAL YR 1985 TOTAL 32.34 MEAN .089 MAX 1.8 MIN .03 AC-FT 64  
WTR YR 1986 TOTAL 43.56 MEAN .12 MAX .82 MIN .04 AC-FT 86

## ARKANSAS RIVER BASIN

149

07234000 BEAVER RIVER AT BEAVER, OK  
(Headwater of the North Canadian River)

LOCATION.--Lat 36°49'20", Long 100°31'05", SW 1/4 sec.7, T.4 N., R.24 E., Beaver County, Hydrologic Unit 11100201, near right bank on downstream side of pier of bridge on U.S. Highway 270 at Beaver, 1.5 mi downstream from Home Creek, 5 mi upstream from Clear Creek, and at mile 576.0.

DRAINAGE AREA.--7,955 mi<sup>2</sup>, of which 4,270-mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1904 to December 1905 (gage heights only), October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311. Published as Beaver Creek at Beaver 1904-5, and October 1937 to September 1970 as North Canadian River at Beaver.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,368.16 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Mar. 29, 1904 to Dec. 31, 1905, nonrecording gage at same vicinity at different datum. Mar. 1, 1938 to Sept. 30, 1946, water-stage recorder at present site at datum 3.0 ft higher.

REMARKS.--Estimated daily discharges: Nov. 9 to Jan. 5, Jan. 7 to Feb. 24, Feb. 26 to Mar. 6, Mar. 8 to Apr. 28, and Apr. 30 to June 4, 6-18. Records poor.

AVERAGE DISCHARGE.--49 years, 89.2 ft<sup>3</sup>/s, 64,630 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 70,000 ft<sup>3</sup>/s, Oct. 8, 1946, maximum gage height, 14.55 ft by slope-area measurement of peak flow in overflow section and extension of rating curve for main channel above 42,000 ft<sup>3</sup>/s; no flow at times in each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 780 ft<sup>3</sup>/s, Oct. 12, gage height, 7.52 ft; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	15	1.6	5.1	11	12	5.7	1.4	.16	.18	.00	.00
2	327	15	1.8	4.6	10	11	6.3	1.0	.22	.14	.00	.00
3	358	15	2.3	5.4	12	11	7.3	.61	.19	.11	.00	.00
4	153	14	3.5	4.7	14	10	7.0	.36	.65	.06	.00	.00
5	77	15	6.3	5.0	13	11	6.7	.23	.60	.00	.00	.00
6	43	13	12	5.5	13	8.8	6.1	.00	.64	.00	.00	.00
7	16	12	10	5.5	12	8.5	6.5	.00	.68	.02	.00	.00
8	15	13	8.1	5.4	11	8.7	6.3	.00	.74	.00	.00	.00
9	77	10	6.2	5.2	12	9.1	6.2	.11	.65	.00	.00	.00
10	371	7.4	4.5	5.0	9.6	7.7	6.0	.26	.23	.00	.00	.00
11	279	7.2	3.4	5.2	7.2	9.5	6.2	.19	.26	.00	.00	.00
12	687	7.8	2.6	5.0	9.7	8.4	5.9	.32	.10	.00	.00	.00
13	556	7.4	2.1	4.9	11	8.4	5.7	.52	.08	.00	.00	.00
14	302	8.8	2.6	5.1	13	8.7	5.5	.63	.06	.00	.00	.00
15	196	11	4.6	5.6	14	11	5.3	.65	.05	.00	.00	.00
16	112	10	7.5	5.3	14	10	5.1	.60	.04	.00	.00	.00
17	67	9.1	7.4	5.2	13	11	8.3	5.8	.05	.00	.00	.00
18	48	8.3	6.6	5.2	13	9.3	6.1	5.2	.04	.00	.00	.00
19	28	7.0	9.7	5.2	12	8.3	5.0	2.8	.05	.00	.00	.00
20	20	7.6	6.3	5.6	12	9.5	5.4	1.7	.11	2.8	.00	.00
21	16	9.2	4.9	5.4	12	8.4	4.1	1.3	.10	.00	.00	.00
22	15	7.0	4.7	5.3	11	8.4	3.4	.84	.08	19	.00	.00
23	41	6.4	4.5	5.3	12	8.7	2.8	.70	.09	36	.00	.00
24	38	7.0	4.4	5.3	12	8.5	2.0	.57	.06	2.6	.00	.00
25	35	6.6	4.1	6.1	11	8.5	1.6	.51	.06	1.1	.00	.00
26	42	6.0	4.6	7.5	11	8.6	1.3	.46	.04	.74	.00	.00
27	21	5.5	6.4	12	12	7.0	8.4	.40	.02	.09	.00	.00
28	19	5.0	5.9	10	12	7.0	8.8	.45	.00	.00	.00	.00
29	18	4.6	5.6	9.7	---	6.6	2.9	.54	.00	.00	.00	.00
30	18	1.9	5.5	10	---	6.0	2.1	.19	.10	.00	.00	.00
31	18	---	5.3	9.6	---	5.3	---	.14	---	.00	.00	---
TOTAL	4029	272.8	165.0	189.9	329.5	274.9	160.0	28.48	6.15	62.84	.00	.00
MEAN	130	9.09	5.32	6.13	11.8	8.87	5.33	.92	.20	2.03	.000	.000
MAX	687	15	12	12	14	12	8.8	5.8	.74	36	.00	.00
MIN	15	1.9	1.6	4.6	7.2	5.3	1.3	.00	.00	.00	.00	.00
AC-FT	7990	541	327	377	654	545	317	56	12	125	.00	.00

CAL YR 1985 TOTAL 9614.77 MEAN 26.3 MAX 687 MIN .00 AC-FT 19070  
WTR YR 1986 TOTAL 5518.49 MEAN 15.1 MAX 687 MIN .00 AC-FT 10950

## ARKANSAS RIVER BASIN

07234000 BEAVER RIVER AT BEAVER, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1952, 1958-59, 1962-63, 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to January 1982.

WATER TEMPERATURE: October 1967 to January 1982.

REMARKS.--Samples were collected quarterly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)
NOV 05...	1200	1028	80020	4.13	15	4490	8.30	20.0	13.0	--	693
MAR 07...	1230	1028	80020	3.22	8.1	6650	8.30	2.0	7.5	1.7	700
APR 29...	1400	1028	80020	3.80	2.9	6560	8.20	31.5	29.0	3.0	692

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCHI FECAL, KF ACAR (COLS./ PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM
NOV 05...	9.6	102	62	120	810	570	200	76	700	65
MAR 07...	11.4	106	K3	K10	920	690	200	100	1100	72
APR 29...	8.7	128	76	200	1000	840	220	120	1100	69

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HC03)	CAR- BONATE IT-FLD (MG/L AS C03)	ALKA- LITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)
NOV 05...	11	9.9	291	5.0	247	2.3	410	1200	1.6	23
MAR 07...	16	9.7	255	11	227	2.0	630	1800	1.6	22
APR 29...	15	9.8	243	0	199	2.4	670	1700	1.5	21

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITU- ENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)
NOV 05...	2710	2800	3.7	110	<0.010	<0.100	0.090	0.100	0.13	0.41
MAR 07...	3740	4000	5.1	82	<0.010	<0.100	0.050	0.060	0.08	0.45
APR 29...	4120	4000	5.6	32	<0.010	<0.100	0.090	0.080	0.10	0.51



## ARKANSAS RIVER BASIN

151

07234000 BEAVER RIVER AT BEAVER, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, TOTAL (MG/L AS P04)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)
NOV 05...	0.50	0.110	0.34	0.090	0.090	0.28	20	6	300	--
MAR 07...	0.50	0.020	--	0.020	0.010	0.03	20	4	200	<10
APR 29...	0.60	0.050	--	0.020	<0.010	--	--	--	--	--
DATE	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)
NOV 05...	<1	<1	<1	2	40	<1	120	30	<0.1	4
MAR 07...	1	<1	3	1	30	<1	160	90	<0.1	8
APR 29...	--	--	--	--	--	--	--	--	--	--
DATE	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, DIS- SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	
NOV 05...	<1	<1	<1	--	21	20	14	0.57	75	
MAR 07...	2	<1	<1	3600	24	20	12	0.26	45	
APR 29...	--	--	--	--	--	--	12	0.09	86	

## ARKANSAS RIVER BASIN

07234100 CLEAR CREEK NEAR ELMWOOD, OK

LOCATION.--Lat 36°38'42", long 100°30'07", SW 1/4 SW 1/4 sec.8, T.2 N., R.24 E., Beaver County, Hydrologic Unit 11100201, on downstream side of right pile bent of county road bridge, 1,000 ft downstream from small irrigation dam, 2.8 mi northeast of Elmwood, and at mile 16.9.

DRAINAGE AREA.--170 mi<sup>2</sup>.

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

REVISED RECORDS.--WSP 2121: 1966.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 2,541.26 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Small diversions for irrigation above station.

AVERAGE DISCHARGE.--21 years, 6.28 ft<sup>3</sup>/s, 4,550 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft<sup>3</sup>/s, Oct. 16, 1969, gage height, 13.97 ft, from floodmark, from rating curve extended above 12,500 ft<sup>3</sup>/s on basis of slope-area measurement at gage height 13.15 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<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)
June 30	2400	*959	*7.82	No other peak greater than base discharge.			
Minimum daily discharge, .77 ft <sup>3</sup> /s, Aug. 13.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.6	1.7	1.5	1.9	1.9	1.7	2.2	2.5	124	1.5	1.0
2	1.6	1.6	1.7	1.5	2.0	1.9	1.8	2.2	1.9	3.0	1.4	.99
3	1.5	1.7	1.6	1.5	2.0	1.9	1.8	2.3	1.7	2.4	1.4	.96
4	1.4	1.7	1.7	1.6	2.0	1.9	1.7	2.3	1.5	2.2	1.2	.93
5	1.4	1.7	1.7	1.7	1.9	1.9	1.8	2.2	1.5	1.9	1.0	.95
6	1.4	1.7	1.6	1.9	1.9	1.9	1.9	2.0	1.5	1.9	.93	.95
7	1.4	1.8	1.7	1.8	2.0	1.9	1.9	2.0	1.6	2.7	.92	.95
8	1.5	1.8	1.6	1.9	1.9	1.9	1.9	2.1	1.6	2.4	.93	.95
9	3.9	1.8	1.6	1.9	1.9	2.1	2.0	1.9	1.9	1.8	.95	.91
10	4.6	1.8	1.6	1.9	1.9	2.4	2.0	1.9	1.8	1.8	.90	.89
11	2.0	1.8	1.5	1.9	1.9	2.2	2.0	1.8	1.5	1.8	.84	.87
12	1.8	1.8	1.5	1.8	1.9	2.0	2.0	1.8	1.4	1.7	.81	.86
13	1.7	1.8	1.5	1.8	2.0	1.8	2.0	1.7	1.3	1.7	.77	.86
14	1.7	2.0	1.5	1.7	2.0	1.8	1.9	2.1	1.4	1.7	1.0	.86
15	1.6	1.9	1.5	1.7	2.1	1.9	1.9	2.5	1.4	1.7	1.1	.88
16	1.6	2.0	1.5	1.7	2.0	1.8	1.9	2.0	1.4	1.6	1.0	.90
17	1.4	2.0	1.6	1.7	2.0	1.7	2.1	1.8	1.3	1.4	.98	.92
18	1.4	2.1	1.7	1.7	2.0	1.9	2.0	2.0	1.3	1.3	.93	.87
19	1.5	2.0	1.6	1.8	2.0	1.7	2.0	1.8	1.3	1.3	.88	.87
20	1.5	2.0	1.6	1.8	1.9	1.8	2.0	1.8	1.4	1.4	.81	.88
21	1.5	1.9	1.6	1.7	1.9	1.7	2.0	1.7	1.3	1.8	.85	.87
22	1.5	1.8	1.6	1.7	1.9	1.7	2.0	1.8	1.3	1.9	.89	.87
23	1.4	1.7	1.5	1.8	1.9	1.7	2.1	1.8	1.2	1.9	.91	.93
24	1.4	1.7	1.5	1.8	1.9	1.7	2.1	1.9	1.0	1.7	.90	.99
25	1.5	1.8	1.5	1.8	1.9	1.8	2.0	2.0	.96	1.7	.81	.89
26	1.6	1.7	1.5	1.8	1.9	1.8	2.1	2.1	.96	1.7	5.2	.88
27	1.6	1.7	1.5	1.8	1.9	1.8	3.0	2.0	.99	1.5	28	.85
28	1.6	1.7	1.5	1.9	1.9	1.8	2.4	1.8	1.0	1.4	1.5	.86
29	1.7	1.8	1.5	1.8	---	1.8	2.3	1.9	1.1	1.4	1.1	9.0
30	1.6	1.8	1.6	1.9	---	1.7	2.2	1.8	23	1.3	1.1	1.9
31	1.7	---	1.5	1.9	---	1.7	---	2.0	---	1.5	1.1	---
TOTAL	53.6	54.2	48.8	54.7	54.4	57.5	60.5	61.2	64.01	177.5	62.61	36.29
MEAN	1.73	1.81	1.57	1.76	1.94	1.85	2.02	1.97	2.13	5.73	2.02	1.21
MAX	4.6	2.1	1.7	1.9	2.1	2.4	3.0	2.5	23	124	28	9.0
MIN	1.4	1.6	1.5	1.5	1.9	1.7	1.7	1.7	.96	1.3	.77	.85
AC-FT	106	108	97	108	108	114	120	121	127	352	124	72

CAL YR 1985 TOTAL 1451.01 MEAN 3.98 MAX 332 MIN .89 AC-FT 2880  
WTR YR 1986 TOTAL 785.30 MEAN 2.15 MAX 124 MIN .77 AC-FT 1560

## 07236500 FORT SUPPLY LAKE NEAR FORT SUPPLY, OK

LOCATION.--Lat 36°33'14", long 99°34'16", in NE 1/4 SE 1/4 sec.17, T.24 N., R.22 W., Woodward County, Hydrologic Unit 11100203, in control tower at left end of Fort Supply Dam on Wolf Creek, 2.0 mi southeast of Fort Supply and at mile 5.5.

DRAINAGE AREA.--1,735 mi<sup>2</sup>, of which 241 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--June 1942 to current year. Prior to October 1970, published as Fort Supply Reservoir near Fort Supply.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earth dam. Outlet works consist of a 540-foot uncontrolled gravity-type concrete weir, one 36-inch diameter gated bypass, and one 18-foot oval-shaped conduit controlled by three vertical-lift sluice gates. Regulated storage began May 4, 1942; conservation pool first filled in June 1942. Capacity, 100,700 acre-ft at elevation 2,028.0 ft, crest of spillway, 13,890 acre-ft at elevation 2,004.0 ft, conservation pool designated in 1965. No storage below elevation 1,987.0 ft. Figures given herein represent total contents. Reservoir is used for flood control and conservation. Revised capacity table, based on survey in 1969, used since Oct. 1, 1972.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 99,500 acre-ft, June 25, 1957, elevation, 2,026.97 ft; no contents at times November 1942 to January 1943.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 24,450 acre-ft, Oct. 16, 17, elevation, 2,006.78 ft; minimum, 13,290 acre-ft, Aug. 14, elevation 2,003.68 ft.

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

2,003	12,080	2,006	17,890
2,004	13,890	2,007	20,100
2,005	15,830	2,009	25,020

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13840	14280	14100	13800	13870	14120	13730	14030	13670	14140	13760	14360
2	13870	14300	14180	13710	13930	14140	13780	14060	13710	14100	13730	14410
3	13780	14260	14300	13690	13970	14160	13750	14160	13760	14140	13710	14390
4	13870	14220	14410	13640	14010	14240	13730	14240	13820	14220	13690	14320
5	13930	14140	14510	13650	14030	14200	13730	14060	13870	14120	13620	14240
6	14030	13930	14510	13580	14060	14280	13780	14300	13890	13990	13600	14100
7	14080	13970	14380	13620	14140	14240	13760	14180	14140	14050	13530	14060
8	14030	14060	14220	13690	14180	14380	13730	14160	14260	14030	13530	14050
9	14530	14030	14060	13780	14260	14320	13750	14240	14340	14030	13510	13970
10	16450	14120	13870	13870	14300	14320	13760	14240	14140	13930	13470	13850
11	21320	14260	13800	13970	14280	14340	13760	14300	14010	13950	13440	13730
12	23120	14340	13820	14060	14180	14320	13780	14260	13930	13870	13440	13710
13	23700	14380	13820	14160	14050	14220	13670	14200	13910	13890	13400	13650
14	24190	14470	13800	14240	14010	14100	13690	14300	13930	13800	14100	13640
15	24390	14510	13800	14340	13970	13990	13690	14260	13970	13760	14800	13600
16	24440	14550	13800	14200	13850	13870	13730	14360	14200	13710	15150	13640
17	24390	14630	13800	14120	13780	13780	13800	14510	14340	13620	15350	13650
18	24310	14550	13820	14050	13760	13580	13670	14800	14450	13550	15230	13730
19	24210	14490	13800	13990	13840	13550	13670	14760	14510	13950	14840	13710
20	24110	14490	13800	13930	13780	13600	13640	14490	14490	14160	14450	13670
21	24030	14470	13800	13800	13850	13640	13640	14360	14510	14180	14160	13650
22	23930	14450	13800	13760	13950	13650	13690	13990	14430	14180	13950	13620
23	23630	14410	13780	13780	13930	13670	13690	13800	14410	14200	14010	13640
24	22520	14410	13760	13640	13990	13820	13640	13800	14380	14100	14050	13650
25	20980	14410	13840	13650	14030	13780	13600	13800	14360	14060	14080	13620
26	19260	14180	13760	13670	14030	13670	13820	13780	14300	14060	14080	13600
27	17580	14050	13760	13760	14050	13760	13850	13780	14220	14030	14140	13640
28	15950	13890	13760	13750	14100	13780	13970	13780	14180	13970	14200	13650
29	14860	13850	13760	13780	---	13780	14120	13780	14160	13950	14220	13820
30	14380	13950	13730	13910	---	13750	13970	13750	14080	13850	14280	13840
31	14320	---	13750	13840	---	13580	---	13710	---	13820	14320	---
MAX	24440	14630	14510	14340	14300	14380	14120	14800	14510	14220	15350	14410
MIN	13780	13850	13730	13580	13760	13550	13600	13710	13670	13550	13400	13600
(†)	2004.22	2004.03	2003.92	2003.97	2004.11	2003.83	2004.04	2003.90	2004.10	2003.96	2004.22	2003.97
(††)	+570	-370	-200	+90	+260	-520	+390	-260	+370	-260	+500	-480
CAL YR 1985	MAX	24440	MIN	11630	(††)	+640						
WTR YR 1986	MAX	24440	MIN	13400	(††)	+90						

(†) ELEVATION, IN FEET, AT END OF MONTH

(††) CHANGE IN CONTENTS, IN ACRE-Feet

## 07237000 WOLF CREEK NEAR FORT SUPPLY, OK

LOCATION.--Lat 36°34'00", long 99°33'05", SE 1/4 SE 1/4 sec.9, T.24 N., R.22 W., Woodward County, Hydrologic Unit 11100203, on left bank on downstream side of bridge on U.S. Highway 270, 1.0 mi southeast of Fort Supply, 1.6 mi downstream from Fort Supply Dam, and at mile 3.9.

DRAINAGE AREA.--1,739 mi<sup>2</sup>, of which 241 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1937 to current year. Prior to October 1, 1941, published as "Near Supply".

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,958.38 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). See WSP 1921 for history of changes prior to Sept. 30, 1962.

REMARKS.--Estimated daily discharges: Oct. 1-15, 18-24, Oct. 26 to Nov. 11, Nov. 13 to Dec. 3, Dec. 6 to Jan. 7, Jan. 9 to Mar. 12, Mar. 14 to Apr. 29, and May 1-20. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow completely regulated since May 1942 by Fort Supply Lake (station 07236500).

AVERAGE DISCHARGE.--(Prior to regulation by Fort Supply Dam) 5 years, (water years 1938-42), 104 ft<sup>3</sup>/s, 73,350 acre-ft/yr; (since regulation by Fort Supply Dam) 44 years (water years 1943-86), 54.3 ft<sup>3</sup>/s, 39,340 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,200 ft<sup>3</sup>/s, June 24, 1939, gage height, 15.60 ft, present datum, from rating curve extended above 8,000 ft<sup>3</sup>/s; no flow at times in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 19.6 ft, present datum, was reached prior to October 1937, from information by Oklahoma State Highway Department.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 926 ft<sup>3</sup>/s, Oct. 26; minimum daily discharge, 1.1 ft<sup>3</sup>/s, Aug. 5-10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	87	5.1	53	23	23	21	2.7	24	17	2.3	1.9
2	4.9	84	4.9	53	24	23	21	2.6	17	16	1.5	1.8
3	4.9	81	4.9	53	23	23	20	2.6	9.7	10	1.2	28
4	4.8	93	18	53	23	23	20	2.6	9.0	2.3	1.2	58
5	4.7	117	34	52	23	23	20	2.6	8.4	2.0	1.1	58
6	4.6	119	81	53	23	23	20	2.5	11	2.0	1.1	57
7	4.6	56	113	31	23	23	21	2.5	12	2.1	1.1	56
8	4.4	28	127	11	23	23	20	2.4	11	2.0	1.1	56
9	4.5	23	127	9.7	24	22	20	2.4	56	2.0	1.1	55
10	5.1	21	126	9.3	23	22	20	2.4	105	2.0	1.1	55
11	4.6	20	91	9.0	66	22	20	2.4	105	2.4	2.0	40
12	4.5	19	55	8.8	81	57	20	18	63	2.2	1.5	24
13	4.4	35	55	8.9	80	92	21	17	19	2.1	1.2	24
14	4.5	79	55	9.0	80	91	20	17	19	1.9	2.2	24
15	79	78	54	42	81	90	20	17	19	1.8	2.2	15
16	99	75	54	74	80	90	20	18	19	2.1	1.4	2.6
17	147	74	55	75	80	90	20	18	18	2.3	1.3	1.9
18	152	74	55	74	59	90	21	18	18	3.7	93	1.7
19	154	71	56	74	26	55	20	101	18	3.7	210	2.7
20	154	69	55	75	24	22	20	170	18	3.7	215	2.4
21	151	69	55	75	25	21	21	91	17	2.3	219	1.7
22	146	69	54	74	24	20	21	210	17	2.0	158	1.7
23	140	69	54	74	23	20	20	118	17	2.0	5.8	1.7
24	563	70	54	46	23	20	20	21	17	2.5	3.5	1.6
25	871	95	53	25	23	20	11	21	17	1.7	2.7	1.6
26	926	130	54	25	23	20	3.1	22	17	1.6	2.5	1.6
27	902	128	53	24	24	20	2.8	23	17	1.6	2.8	1.6
28	866	128	53	24	23	19	2.8	24	17	1.5	2.3	1.7
29	672	79	54	24	---	19	2.7	21	17	1.3	2.0	1.9
30	422	6.9	54	23	---	20	2.7	29	17	1.2	1.8	2.1
31	160	---	54	23	---	20	---	25	---	1.2	2.0	---
TOTAL	6669.5	2146.9	1817.9	1264.7	1077	1146	512.1	1026.7	749.1	102.2	945.0	582.2
MEAN	215	71.6	58.6	40.8	38.5	37.0	17.1	33.1	25.0	3.30	30.5	19.4
MAX	926	130	127	75	81	92	21	210	105	17	219	58
MIN	4.4	6.9	4.9	8.8	23	19	2.7	2.4	8.4	1.2	1.1	1.6
AC-FT	13230	4260	3610	2510	2140	2270	1020	2040	1490	203	1870	1150

CAL YR 1985 TOTAL 18495.1 MEAN 50.7 MAX 926 MIN 1.2 AC-FT 36680  
WTR YR 1986 TOTAL 18039.2 MEAN 49.4 MAX 926 MIN 1.1 AC-FT 35780

## 07237500 NORTH CANADIAN RIVER AT WOODWARD, OK

LOCATION.--Lat 36°26'12", long 99°16'41", SE 1/4 SE 1/4 sec.30, T.23 N., R.19 W., Woodward County, Hydrologic Unit 11100301, near right bank on downstream side of pier of bridge on State Highway 15, 200 ft downstream from The Atchison, Topeka and Santa Fe Railway Co. bridge, 6.0 mi east of Woodward, 7.2 mi upstream from Indian Creek, 27.5 mi downstream from Wolf Creek, and at mile 460.2.

DRAINAGE AREA.--11,589 mi<sup>2</sup>, of which 4,812 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1903 to September 1905 (gage heights only), October 1905 to June 1906, October 1938 to current year. Monthly discharge only for some periods, published in WSP 1311. Published as Canadian River (North Fork) near Woodward 1903-06. Gage-height records collected in this vicinity since 1919 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 1341: Drainage area. WSP 1731: 1951(M).

GAGE.--Water-stage recorder. Datum of gage is 1,829.95 ft, National Geodetic Vertical Datum of 1929. Prior to July 1906, nonrecording gage at railway bridge 200 ft upstream at different datum. Oct. 1, 1938 to Oct. 26, 1943, nonrecording gage and Oct. 27, 1943 to July 12, 1951, water-stage recorder, at site 7.8 mi upstream at datum 37.01 ft higher than present datum.

REMARKS.--Estimated daily discharges: Dec. 1-3, 11-13, and Feb. 10-12. Records good. Some regulation since May 1942 by Fort Supply Lake on Wolf Creek 33 mi upstream (station 07236500).

AVERAGE DISCHARGE.--48 years, (water years 1939-86), 176 ft<sup>3</sup>/s, 127,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,000 ft<sup>3</sup>/s Oct. 10, 1946, gage height, 9.80 ft, site and datum then in use; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 12, 1923, reached a stage of 11.0 ft, site and datum then in use; from reports of National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,100 ft<sup>3</sup>/s Oct. 12, gage height, 7.90 ft; minimum daily discharge, 7.1 ft<sup>3</sup>/s, Aug. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	295	82	123	89	87	80	46	69	60	17	38
2	39	232	61	124	90	88	76	43	83	57	16	36
3	37	211	65	124	90	87	76	41	76	52	15	34
4	34	200	89	121	88	86	73	40	66	49	13	35
5	32	206	93	119	85	86	73	37	63	58	11	57
6	31	215	109	121	84	85	73	36	56	45	9.8	62
7	32	208	134	118	84	84	73	33	70	40	9.3	64
8	37	181	170	105	87	83	72	34	63	35	9.4	65
9	61	154	174	87	87	84	70	37	71	30	18	65
10	444	142	176	85	72	82	71	36	81	25	14	65
11	760	134	165	86	61	81	71	37	111	23	9.1	67
12	745	129	131	82	93	85	72	31	115	21	7.9	62
13	317	127	127	79	125	98	71	29	100	19	7.1	49
14	246	172	131	76	137	127	69	79	70	17	28	45
15	215	190	131	76	142	131	67	97	65	15	227	43
16	306	177	133	91	146	132	67	70	75	14	125	41
17	402	170	132	125	150	134	69	122	177	12	95	32
18	374	167	130	130	151	141	67	80	130	12	61	27
19	342	161	128	132	138	136	65	77	109	11	68	24
20	331	153	127	134	112	119	64	90	92	38	146	21
21	318	150	127	133	101	98	63	156	83	182	169	20
22	305	147	127	129	98	93	61	115	77	125	186	18
23	293	146	127	129	97	91	60	168	72	76	172	17
24	278	143	128	130	95	89	59	136	69	59	91	16
25	578	143	125	115	94	86	57	86	65	46	67	15
26	868	153	125	96	93	83	55	77	61	39	54	14
27	982	176	125	92	90	81	57	73	58	32	53	13
28	990	176	123	93	87	80	61	72	59	28	48	12
29	980	176	124	92	---	79	65	68	55	24	42	14
30	780	145	124	90	---	77	51	66	50	20	39	20
31	484	---	124	89	---	77	---	69	---	18	39	---
TOTAL	11679	5179	3867	3326	2866	2970	2008	2181	2391	1282	1866.6	1091
MEAN	377	173	125	107	102	95.8	66.9	70.4	79.7	41.4	60.2	36.4
MAX	990	295	176	134	151	141	80	168	177	182	227	67
MIN	31	127	61	76	61	77	51	29	50	11	7.1	12
AC-FT	23170	10270	7670	6600	5680	5890	3980	4330	4740	2540	3700	2160

CAL YR 1985 TOTAL 39388.8 MEAN 108 MAX 990 MIN 5.9 AC-FT 78130  
WTR YR 1986 TOTAL 40706.6 MEAN 112 MAX 990 MIN 7.1 AC-FT 80740

## ARKANSAS RIVER BASIN

07237500 NORTH CANADIAN RIVER AT WOODWARD, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1955, 1958-59, 1961-63, 1975 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1974 to January 1982.

WATER TEMPERATURE: October 1974 to January 1982.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)
NOV 06...	1100	1028	80020	4.39	214	1470	8.20	9.0	13.0	--	710
JAN 29...	1500	1028	80020	3.41	90	2100	7.90	11.0	9.0	6.0	716
MAR 05...	1500	1028	80020	3.35	85	2080	8.20	18.0	15.0	3.2	711
MAY 01...	1300	1028	80020	3.01	45	2150	8.30	23.5	21.0	5.5	717
JUN 26...	1500	1028	80020	3.14	60	1500	8.20	30.5	31.0	10	712
AUG 15...	1330	1028	80020	3.71	136	784	7.60	26.5	22.5	140	709

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS./ 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
NOV 06...	9.2	94	290	--	370	170	100	30	160	48	4
JAN 29...	11.3	105	K11	K11	520	310	140	42	210	46	4
MAR 05...	9.4	101	K2	<57	560	330	150	45	260	50	5
MAY 01...	9.7	117	240	78	610	380	160	52	230	45	4
JUN 26...	9.3	135	K1500	K60	390	220	100	35	160	47	4
AUG 15...	6.6	82	K17000	K14000	250	190	75	16	54	31	2

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HC03)	CAR- BONATE IT-FLD (MG/L AS C03)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITU- ENTS, DIS- SOLVED (MG/L)
NOV 06...	5.7	246	0	202	2.5	200	250	0.70	21	902	890
JAN 29...	5.0	260	0	213	5.2	330	320	0.80	25	1220	1200
MAR 05...	5.0	284	0	233	2.8	320	360	0.80	22	1280	1300
MAY 01...	5.3	282	0	231	2.2	380	330	0.80	19	1420	1300
JUN 26...	4.9	206	0	169	2.1	270	250	0.70	20	973	940
AUG 15...	5.4	82	0	67	3.3	190	70	0.30	8.8	--	460



## ARKANSAS RIVER BASIN

157

07237500 NORTH CANADIAN RIVER AT WOODWARD, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3)	NITRO- GEN, DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)
NOV 06...	1.2	521	0.380	--	0.020	0.07	0.400	0.250	0.180	0.23
JAN 29...	1.7	298	0.440	1.9	0.040	0.13	0.480	0.300	0.280	0.36
MAR 05...	1.7	294	0.490	--	0.040	0.13	0.530	0.210	0.200	0.26
MAY 01...	1.9	173	0.560	--	0.040	0.13	0.600	0.160	0.140	0.18
JUN 26...	1.3	158	0.190	--	0.010	0.03	0.200	0.050	0.050	0.06
AUG 15...	0.63	169	0.300	--	0.020	0.07	0.320	0.060	0.040	0.05

DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
NOV 06...	0.85	1.1	0.200	0.61	0.100	0.100	0.31	30	6	190
JAN 29...	0.50	0.80	0.130	0.40	0.090	0.080	0.25	--	--	--
MAR 05...	0.69	0.90	0.100	--	0.080	0.050	0.15	30	3	200
MAY 01...	0.84	1.0	0.130	--	0.050	0.050	0.15	--	--	--
JUN 26...	1.5	1.5	0.150	--	0.020	<0.010	--	--	--	--
AUG 15...	0.34	0.40	0.340	--	0.230	0.220	0.67	--	--	--

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
NOV 06...	<0.5	<1	<1	<3	1	20	<1	43	89	0.1
JAN 29...	--	--	--	--	--	--	--	--	--	--
MAR 05...	<10	1	<1	1	2	20	1	50	20	<0.1
MAY 01...	--	--	--	--	--	--	--	--	--	--
JUN 26...	--	--	--	--	--	--	--	--	--	--
AUG 15...	--	--	--	--	--	--	--	--	--	--

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 06...	<10	2	<1	1	1000	8	23	89	51	79
JAN 29...	--	--	--	--	--	--	--	24	5.9	60
MAR 05...	4	1	<1	<1	1500	7	20	28	6.4	30
MAY 01...	--	--	--	--	--	--	--	35	4.3	89
JUN 26...	--	--	--	--	--	--	--	86	14	84
AUG 15...	--	--	--	--	--	--	--	263	97	92

LOCATION.--Lat 36°11'06", long 98°55'15", in NW 1/4 sec.28, T.20 N., R.16 W., Major County, Hydrologic Unit 11100301, near center of span on downstream side of pier of bridge on U.S. Highway 60, 2.0 mi upstream from Seiling Creek, 2.2 mi north of Seiling, 2.8 mi downstream from Deep Creek, and at mile 422.6.

PERIOD OF RECORD.--July 1946 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,675.53 ft, National Geodetic Vertical Datum of 1929.  
July 1, 1946 to Aug. 17, 1964, at site 60 ft downstream and prior to Oct. 1, 1954, at datum 5.00 ft higher.

AVERAGE DISCHARGE.--40 years, 197 ft<sup>3</sup>/s, 142,700 acre-ft/yr.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,290 ft<sup>3</sup>/s, Sept. 30, gage height, 9.34 ft; minimum daily discharge, 11 ft<sup>3</sup>/s, Aug. 7, 13.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	79	568	176	167	137	120	122	85	103	78	24	59
2	72	402	128	167	136	122	156	79	131	82	20	58
3	68	322	135	167	140	121	134	72	281	79	17	56
4	63	282	148	165	142	119	127	69	326	71	15	53
5	57	263	145	159	134	119	120	68	222	64	14	53
6	54	264	150	161	130	118	118	65	155	68	12	65
7	50	269	166	159	130	117	118	62	134	78	11	73
8	50	261	188	150	132	116	115	62	207	79	12	77
9	62	233	231	146	134	121	112	62	237	62	34	76
10	143	197	240	141	132	122	112	66	153	51	60	76
11	744	180	239	134	125	121	112	73	133	46	25	78
12	901	172	238	136	127	131	114	74	142	43	16	77
13	834	169	199	133	157	135	114	66	140	40	11	74
14	644	194	174	131	178	146	110	63	131	35	25	66
15	647	369	188	128	186	167	107	93	114	31	165	63
16	384	456	184	128	203	170	106	182	100	28	233	60
17	397	327	185	142	218	173	107	259	98	25	145	61
18	487	281	185	172	216	189	108	582	172	23	119	51
19	468	256	182	174	213	201	104	281	159	21	82	44
20	428	233	180	177	190	184	104	181	131	19	68	41
21	410	218	180	179	157	160	101	156	114	25	131	37
22	394	214	180	174	147	142	98	198	105	106	169	35
23	382	212	179	171	145	139	97	157	119	126	186	33
24	368	207	175	171	139	134	96	194	177	75	184	33
25	345	204	169	170	135	130	93	170	136	55	107	30
26	544	204	167	149	134	124	92	122	99	44	78	27
27	751	213	168	132	133	121	94	113	89	37	67	26
28	869	240	167	133	124	119	93	106	85	30	65	26
29	908	240	166	136	---	117	94	105	84	25	61	65
30	914	242	168	134	---	115	97	103	76	21	54	864
31	818	---	168	135	---	115	---	101	---	20	56	---
TOTAL	13335	7892	5548	4721	4274	4228	3275	4069	4353	1587	2266	2437
MEAN	430	263	179	152	153	136	109	131	145	51.2	73.1	81.2
MAX	914	568	240	179	218	201	156	582	326	126	233	864
MIN	50	169	128	128	124	115	92	62	76	19	11	26
AC-FT	26450	15650	11000	9360	8480	8390	6500	8070	8630	3150	4490	4830

CAL YR 1985	TOTAL 56936	MEAN 156	MAX 1080	MIN 8.3	AC-FT 112900
WTR YR 1986	TOTAL 57985	MEAN 159	MAX 914	MIN 11	AC-FT 115000

## 07238500 CANTON LAKE NEAR CANTON, OK

LOCATION.--Lat 36°05'03", long 98°36'05", in SE 1/4 NE 1/4 sec.32, T.19 N., R.13 W., Blaine County, Hydrologic Unit 11100301, near right end of Canton Dam on North Canadian River, 2.0 mi northwest of Canton, and at mile 394.3.

DRAINAGE AREA.--12,483 mi<sup>2</sup>, of which 4,883 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--April 1948 to current year. Prior to October 1970, published as Canton Reservoir near Canton.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earth dam. The outlet works consists of a concrete gravity, chute-type weir spillway controlled by 16 taintor gates with net length of 640 ft, three sluice gates and two 24-inch valved pipes. Regulated storage began Apr. 15, 1948; conservation pool was first filled July 4, 1948. Capacity, 377,100 acre-ft at elevation 1,638.0 ft (flood-control pool), 109,700 acre-ft at elevation 1,615.2 ft. (Normal water-supply pool designated in 1965), 93,180 acre-ft at elevation 1,613.0 ft (crest of spillway), and 14,140 acre-ft at elevation 1,596.5 ft (conservation pool). Figures given herein represent total contents. Reservoir was designed for flood control, irrigation, and conservation, but owing to a lack of facilities, it is not being used for irrigation at this time. Revised capacity table, based on survey in 1980, used since Oct. 1, 1981.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 258,600 acre-ft, May 25, 1951, elevation, 1,628.05 ft; minimum since conservation pool was first filled, 867 acre-ft, May 5, 1955, elevation, 1,585.66 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 116,800 acre-ft, Nov. 18, elevation, 1616.09 ft; minimum, 72,040 acre-ft, Sept. 28, elevation, 1,609.87 ft.

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

1,607	55,450	1,615	108,200
1,611	79,350	1,617	124,400
1,613	93,180	1,619	142,000

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85430	107600	111500	111000	112900	111200	112300	111100	111400	112600	107100	107900
2	85560	108500	110900	111100	113100	111200	112600	111000	111800	112500	107000	107900
3	85560	109100	110900	111000	113200	111200	112800	110700	112200	112200	106700	107900
4	85560	109600	111200	111100	113400	111000	112600	110400	112500	111800	106400	107400
5	85560	109800	111400	110700	113300	110900	112400	110800	112800	111600	106800	106000
6	85290	110800	111600	111100	112900	110800	112200	110400	112900	111600	106600	104900
7	84880	110900	112200	110900	112900	110800	112300	110500	113300	112600	106400	104900
8	85700	111100	112400	110500	112600	110000	111900	110900	113300	112600	106400	100100
9	86390	112100	113300	110500	112300	110500	111600	110800	113200	112500	106900	98380
10	86670	112300	113600	110500	112000	110400	111600	111300	112900	112000	106800	97350
11	87090	112500	112300	110700	111600	110400	111400	111200	112500	111900	106700	94860
12	88130	112900	111700	110800	111000	110700	111100	111400	112100	111800	106300	93180
13	89470	113500	111000	110900	110900	110500	112300	111200	111800	111500	105800	91200
14	90530	115000	110800	111000	110700	110400	110600	111600	112500	111200	107800	89650
15	91520	114900	110800	111000	110600	110500	110200	111300	112500	111000	107900	87810
16	92530	115600	110800	111200	111100	110500	109800	112800	112500	110500	108000	86260
17	93320	116200	110800	111200	111200	110900	110100	113200	112500	110300	108300	84630
18	94410	116600	110900	111600	111300	111200	110400	113500	112400	110100	108200	82740
19	95210	116100	111100	111600	111300	110900	110400	113900	112400	110300	108300	81310
20	95790	115500	111100	111600	111800	111200	110400	113600	112600	109700	108300	79820
21	96520	114900	111100	112000	111600	111200	110400	113300	112500	109500	108400	78510
22	97260	114400	111200	112000	111400	111200	110400	113100	112500	109200	108400	77140
23	98000	113900	111200	111900	111500	111500	110400	112900	113000	109200	108600	75780
24	98590	113500	111300	112300	111500	111200	110100	112700	113100	108900	108700	74610
25	99190	112700	110900	112500	111500	111600	110100	112300	113100	109000	108600	73310
26	99940	112600	111200	112700	111800	111900	110600	112300	112900	108700	108500	72610
27	101000	111900	111200	112500	111500	111800	111000	111700	112800	108400	108600	72490
28	102100	111500	111100	112600	111200	111900	111000	111400	112600	108100	108300	72800
29	103500	111200	111100	112800	---	112000	110700	111200	112200	107700	108000	74870
30	104600	112000	111200	112600	---	112100	111300	111400	112000	107500	107900	76300
31	106100	---	111200	112700	---	112300	---	111300	---	107400	107900	---
MAX	106100	116600	113600	112800	113400	112300	112800	113900	113300	112600	108700	107900
MIN	84880	107600	110800	110500	110600	110000	109800	110400	111400	107400	105800	72490
(+)	1614.73	1615.15	1615.39	1615.48	1615.39	1615.52	1615.40	1615.49	1614.90	1614.96	1610.54	
(++)	+20,590	+5,900	-800	+1,500	-1,500	+1,100	-1,000	0	+900	-4,600	+500	-31,600
CAL YR 1985	MAX	116600	MIN	60800	(+)	+50,060						
WTR YR 1986	MAX	116600	MIN	72490	(+)	-9,010						

(+) ELEVATION, IN FEET, AT END OF MONTH  
(++) CHANGE IN CONTENTS, IN ACRE-Feet

360544098354701 CANTON LAKE CROSS SECTION NO. 1 SITE NO. 1

LOCATION.--Lat 36°05'44", long 98°35'47".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Samples were collected in a Kemmerer sampler. Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)
NOV										
18...	1337	1028	80020	1.00	117000	1640	8.40	--	11.0	19
18...	1340	1028	1028	5.00	117000	1650	8.40	--	10.5	--
18...	1341	1028	80020	10.0	117000	1650	8.50	--	10.5	18
18...	1342	1028	1028	15.0	117000	1660	8.50	--	10.5	--
18...	1343	1028	1028	20.0	117000	1650	8.50	--	11.0	--
18...	1344	1028	80020	23.0	117000	1650	8.50	--	10.5	150
MAR										
27...	1202	1028	80020	1.00	112000	1760	8.20	21.0	14.0	13
27...	1212	1028	1028	5.00	112000	1740	8.20	--	13.5	--
27...	1220	1028	1028	10.0	112000	1770	8.20	--	13.0	--
27...	1222	1028	80020	15.0	112000	1690	8.20	21.0	13.0	18
27...	1226	1028	1028	20.0	112000	1770	8.20	--	13.0	--
27...	1230	1028	1028	25.0	112000	1780	8.20	--	12.5	--
27...	1234	1028	80020	27.0	112000	1780	8.20	21.0	12.5	56
JUN										
24...	0930	1028	80020	1.00	113000	1740	8.00	--	25.5	6.0
24...	0932	1028	1028	5.00	113000	1740	8.00	--	25.5	--
24...	0934	1028	1028	10.0	113000	1760	8.00	--	25.5	--
24...	0936	1028	80020	15.0	113000	1800	7.80	--	25.5	15
24...	0938	1028	1028	20.0	113000	1820	7.60	--	25.5	--
24...	0940	1028	1028	25.0	113000	1840	7.80	--	25.0	--
24...	0942	1028	80020	28.0	113000	1850	7.40	--	24.0	150
SEP										
15...	1256	1028	80020	1.00	87800	1930	8.00	30.0	22.0	14
15...	1305	1028	1028	5.00	87800	1940	8.00	--	22.0	--
15...	1309	1028	80020	10.0	87800	1920	8.00	30.0	21.5	9.9
15...	1311	1028	1028	15.0	87800	1900	8.00	--	21.5	--
15...	1313	1028	1028	20.0	87800	1930	7.90	--	21.5	--
15...	1315	1028	80020	25.0	87800	1950	7.90	30.0	21.5	22

DATE	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM
NOV									
18...	711	10.2	100	430	280	100	43	180	47
18...	711	10.2	99	--	--	--	--	--	--
18...	711	10.1	98	430	280	100	43	180	47
18...	711	10.0	97	--	--	--	--	--	--
18...	711	10.0	97	--	--	--	--	--	--
18...	711	10.0	97	430	280	100	43	180	47
MAR									
27...	727	9.3	95	450	270	110	43	170	45
27...	727	10.0	101	--	--	--	--	--	--
27...	727	10.4	104	--	--	--	--	--	--
27...	727	10.3	103	450	270	110	43	180	46
27...	727	10.2	102	--	--	--	--	--	--
27...	727	10.3	102	--	--	--	--	--	--
27...	727	10.3	102	460	260	110	44	180	46
JUN									
24...	720	7.4	96	420	260	100	42	170	46
24...	720	7.7	100	--	--	--	--	--	--
24...	720	7.3	95	--	--	--	--	--	--
24...	720	6.9	90	450	290	110	43	170	45
24...	720	6.8	89	--	--	--	--	--	--
24...	720	6.2	80	--	--	--	--	--	--
24...	720	4.3	55	450	280	110	42	170	45
SEP									
15...	720	8.1	99	430	280	97	45	180	47
15...	720	8.2	100	--	--	--	--	--	--
15...	720	7.4	90	420	280	97	44	180	47
15...	720	7.3	88	--	--	--	--	--	--
15...	720	7.2	87	--	--	--	--	--	--
15...	720	6.9	83	430	280	98	44	180	47

360544098354701 CANTON LAKE CROSS SECTION NO. 1 SITE NO. 1--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
NOV									
18...	4	7.2	182	0	149	1.2	310	260	1020
18...	--	--	--	--	--	--	--	--	--
18...	4	6.8	174	2.0	146	0.9	300	260	1020
18...	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--
18...	4	8.2	176	1.0	145	0.9	310	260	1010
MAR									
27...	4	6.9	228	0	186	2.3	310	240	1080
27...	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--
27...	4	6.9	224	0	184	2.2	320	240	1080
27...	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--
27...	4	7.0	234	0	192	2.3	340	260	1080
JUN									
24...	4	7.0	--	--	--	3.1	320	250	1060
24...	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--
24...	4	7.1	202	0	166	5.1	320	250	1060
24...	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--
24...	4	7.2	--	--	--	13	320	260	1070
SEP									
15...	4	8.1	--	--	--	2.8	320	270	1380
15...	--	--	--	--	--	--	--	--	--
15...	4	8.1	173	0	142	2.7	320	250	1300
15...	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--
15...	4	8.2	--	--	--	3.5	330	260	1360

360558098351501 CANTON LAKE CROSS SECTION NO. 1 SITE NO. 2

LOCATION.--Lat 36°05'58", long 98°35'15".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV											
18...	1447	1028	1028	1.00	117000	1650	8.50	10.5	711	10.2	99
18...	1449	1028	1028	5.00	117000	1670	8.50	10.5	711	10.0	97
18...	1450	1028	1028	10.0	117000	1680	8.50	10.5	711	9.9	96
18...	1451	1028	1028	15.0	117000	1690	8.50	11.0	711	9.9	97
18...	1453	1028	1028	20.0	117000	1680	8.50	11.0	711	9.9	97
18...	1455	1028	1028	25.0	117000	1680	8.50	10.5	711	9.9	96
18...	1458	1028	1028	28.0	117000	1680	8.50	11.5	711	9.9	97
MAR											
27...	1315	1028	1028	1.00	112000	1760	8.20	13.0	730	9.8	98
27...	1318	1028	1028	5.00	112000	1770	8.20	13.0	730	9.8	98
27...	1321	1028	1028	10.0	112000	1750	8.20	12.5	730	9.7	95
27...	1324	1028	1028	15.0	112000	1770	8.20	12.5	730	9.6	94
27...	1326	1028	1028	20.0	112000	1760	8.20	12.5	730	9.6	95
27...	1329	1028	1028	25.0	112000	1790	8.20	11.5	730	9.7	94
27...	1333	1028	1028	28.0	112000	1790	8.20	11.5	730	9.7	94
JUN											
24...	1000	1028	1028	1.00	113000	1760	8.10	26.0	720	7.8	103
24...	1001	1028	1028	5.00	113000	1770	8.00	25.5	720	7.5	98
24...	1002	1028	1028	10.0	113000	1790	8.00	25.5	720	7.9	103
24...	1003	1028	1028	15.0	113000	1820	8.00	25.5	720	8.0	104
24...	1004	1028	1028	22.0	113000	1840	8.00	25.0	720	7.6	98
SEP											
15...	1330	1028	1028	1.00	87800	1950	8.20	22.5	720	8.6	106
15...	1335	1028	1028	5.00	87800	1920	8.20	22.5	720	8.4	103
15...	1337	1028	1028	10.0	87800	1920	8.20	22.5	720	8.4	103
15...	1339	1028	1028	15.0	87800	1920	8.20	22.0	720	8.2	100
15...	1340	1028	1028	20.0	87800	1920	8.20	21.5	720	7.7	93
15...	1342	1028	1028	23.0	87800	1920	8.20	21.5	720	7.4	90

## ARKANSAS RIVER BASIN

360612098344001 CANTON LAKE CROSS SECTION NO. 1 SITE NO. 3

LOCATION.--Lat 36°06'12", long 98°34'40".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

		AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV											
18...	1514	1028	1028	1.00	117000	1680	8.40	11.5	711	10.1	100
18...	1515	1028	1028	5.00	117000	1660	8.50	12.0	711	10.1	101
18...	1516	1028	1028	10.0	117000	1670	8.50	12.0	711	10.0	100
18...	1517	1028	1028	15.0	117000	1670	8.50	11.5	711	9.9	98
18...	1518	1028	1028	20.0	117000	1670	8.50	12.0	711	9.9	99
18...	1519	1028	1028	22.0	117000	1680	8.50	11.5	711	9.9	98
MAR											
27...	1410	1028	1028	1.00	112000	1800	8.20	14.0	730	9.2	94
27...	1415	1028	1028	5.00	112000	1790	8.20	12.5	730	9.2	90
27...	1419	1028	1028	10.0	112000	1760	8.20	11.5	730	9.4	91
27...	1421	1028	1028	15.0	112000	1780	8.20	11.5	730	9.3	90
27...	1424	1028	1028	20.0	112000	1800	8.20	12.0	730	9.4	91
27...	1427	1028	1028	25.0	112000	1760	8.20	12.0	730	9.5	93
JUN											
24...	1030	1028	1028	1.00	113000	1780	8.20	26.0	720	8.3	109
24...	1031	1028	1028	5.00	113000	1790	8.20	25.5	720	7.0	91
24...	1032	1028	1028	10.0	113000	1800	8.10	25.5	720	6.9	90
24...	1033	1028	1028	15.0	113000	1830	8.10	25.5	720	7.6	99
24...	1034	1028	1028	20.0	113000	1840	7.70	25.0	720	7.2	93
24...	1035	1028	1028	25.0	113000	1860	7.80	24.5	720	5.6	72
SEP											
15...	1349	1028	1028	1.00	87800	1960	8.20	22.5	720	9.3	114
15...	1351	1028	1028	5.00	87800	1940	8.30	22.5	720	9.2	113
15...	1352	1028	1028	10.0	87800	1900	8.30	22.5	720	9.2	113
15...	1354	1028	1028	15.0	87800	1910	8.30	22.5	720	8.0	98
15...	1357	1028	1028	19.0	87800	1920	8.40	22.5	720	9.2	113

360744098364101 CANTON LAKE CROSS SECTION NO. 2 SITE NO. 1

LOCATION.--Lat 36°07'44", long 98°36'41".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

		AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV											
18...	1545	1028	1028	1.00	117000	1710	8.50	12.5	711	10.2	103
18...	1547	1028	1028	5.00	117000	1720	8.50	12.0	711	10.2	103
18...	1548	1028	1028	10.0	117000	1710	8.50	12.0	711	10.2	102
18...	1549	1028	1028	15.0	117000	1740	8.50	11.5	711	10.1	100
MAR											
27...	1446	1028	1028	1.00	112000	1760	8.00	14.0	730	8.8	90
27...	1451	1028	1028	5.00	112000	1760	8.20	13.5	730	9.0	91
27...	1453	1028	1028	10.0	112000	1770	8.20	13.0	730	9.1	91
27...	1456	1028	1028	15.0	112000	1750	8.20	13.5	730	9.1	92
27...	1459	1028	1028	20.0	112000	1740	8.30	13.0	730	9.2	92
JUN											
24...	1100	1028	1028	1.00	113000	1700	8.10	27.0	720	7.2	96
24...	1101	1028	1028	5.00	113000	1730	8.00	26.5	720	7.0	93
24...	1102	1028	1028	10.0	113000	1760	8.10	26.0	720	6.8	89
24...	1103	1028	1028	15.0	113000	1780	8.10	26.0	720	6.8	89
24...	1104	1028	1028	18.0	113000	1790	7.90	25.5	720	6.1	80
SEP											
15...	1410	1028	1028	1.00	87800	1920	8.40	23.0	720	9.4	117
15...	1412	1028	1028	5.00	87800	1940	8.40	23.0	720	9.3	116
15...	1413	1028	1028	10.0	87800	1910	8.40	23.0	720	9.2	114
15...	1415	1028	1028	15.0	87800	1930	8.20	22.0	720	7.8	95



## ARKANSAS RIVER BASIN

163

360808098362101 CANTON LAKE CROSS SECTION NO. 2 SITE NO. 2

LOCATION.--Lat 36°08'08", long 98°36'21".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

									BARO- METRIC PRES- SURE	OXYGEN, DIS- SOLVED	
DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OF HG)	OXYGEN, DIS- SOLVED (MG/L)	(PER- CENT SATUR- ATION)
NOV											
18...	1558	1028	1028	1.00	117000	1740	8.50	11.5	711	10.2	101
18...	1600	1028	1028	5.00	117000	1740	8.50	11.5	711	10.2	100
18...	1601	1028	1028	10.0	117000	1740	8.50	11.5	711	10.1	99
18...	1603	1028	1028	14.0	117000	1740	8.50	11.0	711	9.9	97
MAR											
27...	1507	1028	1028	1.00	112000	1760	8.20	14.0	730	9.2	93
27...	1510	1028	1028	5.00	112000	1770	8.30	13.5	730	9.1	92
27...	1513	1028	1028	10.0	112000	1780	8.30	13.5	730	9.2	92
27...	1515	1028	1028	15.0	112000	1800	8.30	13.0	730	9.2	92
27...	1518	1028	1028	20.0	112000	1760	8.20	13.0	730	9.3	92
27...	1521	1028	1028	23.0	112000	1760	8.20	13.0	730	9.2	91
JUN											
24...	1130	1028	1028	1.00	113000	1720	8.20	28.5	720	7.8	107
24...	1131	1028	1028	5.00	113000	1740	8.20	27.0	720	7.7	103
24...	1132	1028	1028	10.0	113000	1740	8.20	26.0	720	7.7	101
24...	1133	1028	1028	15.0	113000	1760	8.20	26.0	720	7.6	100
24...	1134	1028	1028	20.0	113000	1760	8.20	26.0	720	6.6	87
SEP											
15...	1421	1028	1028	1.00	87800	1940	8.40	23.0	720	9.4	116
15...	1422	1028	1028	5.00	87800	1920	8.40	22.5	720	9.4	116
15...	1424	1028	1028	10.0	87800	1960	8.40	22.5	720	9.4	116
15...	1426	1028	1028	16.0	87800	1950	8.30	22.0	720	8.3	101

360828098360501 CANTON LAKE CROSS SECTION NO. 2 SITE NO. 3

LOCATION.--Lat 36°08'28", long 98°36'05".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.-- Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY	AGENCY	SAMPLING	RESERVOIR	SPECIFIC	PH	TEMPERATURE	BARO-	OXYGEN,	OXYGEN,
		COLLECTING	ANALYZING						METRIC		
		SAMPLE	SAMPLE	DEPTH	STORAGE	CONDUCTANCE	(STANDARD	WATER	SURE	SOLVED	(PERCENT
		(CODE	(CODE	(FEET)	(AC-FT)	(US/CM)	UNITS)	(DEG C)	(MM	(MG/L)	SATUR-ATION)
		NUMBER)	NUMBER)						OF		
		NUMBER)	NUMBER)						HG)		
NOV											
18...	1611	1028	1028	1.00	117000	1760	8.50	12.0	711	10.1	101
18...	1612	1028	1028	5.00	117000	1760	8.50	12.0	711	10.0	100
18...	1613	1028	1028	10.0	117000	1740	8.50	12.0	711	9.9	99
18...	1615	1028	1028	14.0	117000	1740	8.50	11.5	711	10.0	99
MAR											
27...	1526	1028	1028	1.00	112000	1790	8.30	13.0	730	9.1	91
27...	1528	1028	1028	5.00	112000	1750	8.30	13.0	730	9.3	93
27...	1530	1028	1028	10.0	112000	1780	8.30	13.0	730	9.3	93
27...	1533	1028	1028	15.0	112000	1790	8.30	13.0	730	9.2	92
JUN											
24...	1145	1028	1028	1.00	113000	1750	8.20	28.0	720	7.6	104
24...	1146	1028	1028	5.00	113000	1750	8.20	26.5	720	7.4	98
24...	1147	1028	1028	10.0	113000	1760	8.20	26.0	720	7.7	101
24...	1148	1028	1028	15.0	113000	1770	8.20	26.0	720	7.7	101
24...	1149	1028	1028	20.0	113000	1770	8.00	26.0	720	5.9	78
SEP											
15...	1431	1028	1028	1.00	87800	1960	8.40	23.0	720	9.8	121
15...	1433	1028	1028	5.00	87800	1910	8.50	23.0	720	10.0	124
15...	1435	1028	1028	10.0	87800	1940	8.40	22.5	720	9.8	121
15...	1437	1028	1028	12.0	87800	1960	8.30	23.0	720	9.5	118

360809098391601 CANTON LAKE CROSS SECTION NO. 3 SITE NO. 1

LOCATION.--Lat 36°08'09", long 98°39'16".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV											
18...	1648	1028	1028	1.00	117000	1770	8.50	11.5	711	10.2	101
18...	1650	1028	1028	5.00	117000	1770	8.50	11.5	711	9.8	97
MAR											
27...	1549	1028	1028	1.00	112000	1880	8.30	16.0	730	8.9	95
27...	1552	1028	1028	5.00	112000	1860	8.30	16.5	730	9.0	97
27...	1554	1028	1028	10.0	112000	1870	8.30	16.5	730	8.9	96
JUN											
24...	1215	1028	1028	1.00	113000	1700	8.40	28.0	720	6.6	90
24...	1216	1028	1028	5.00	113000	1720	8.40	26.5	720	7.0	93
24...	1217	1028	1028	10.0	113000	1730	8.30	26.0	720	6.5	85
SEP											
15...	1449	1028	1028	1.00	87800	1950	8.20	23.5	720	8.3	104
15...	1450	1028	1028	5.00	87800	1950	8.20	23.5	720	8.5	107
15...	1452	1028	1028	7.00	87800	1930	8.10	23.5	720	8.2	103

360828098390701 CANTON LAKE CROSS SECTION NO. 3 SITE NO. 2

LOCATION.--Lat 36°08'28", long 98°39'07".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV											
18...	1642	1028	1028	1.00	117000	1700	8.50	12.5	711	10.1	103
18...	1643	1028	1028	5.00	117000	1740	8.50	12.0	711	9.8	98
18...	1644	1028	1028	8.00	117000	1730	8.50	12.0	711	9.6	96
MAR											
27...	1601	1028	1028	1.00	112000	1770	8.30	15.5	730	9.0	95
27...	1604	1028	1028	5.00	112000	1780	8.40	15.5	730	9.0	95
27...	1606	1028	1028	10.0	112000	1770	8.40	15.0	730	9.0	94
JUN											
24...	1230	1028	1028	1.00	113000	1700	8.20	29.0	720	6.9	96
24...	1231	1028	1028	5.00	113000	1700	8.10	26.5	720	7.2	96
24...	1232	1028	1028	12.0	113000	1750	8.10	26.0	720	6.5	85
SEP											
15...	1456	1028	1028	1.00	87800	1990	8.20	23.5	720	8.4	105
15...	1459	1028	1028	5.00	87800	1930	8.20	23.0	720	8.4	105
15...	1500	1028	1028	7.00	87800	1960	8.00	22.5	720	6.8	84

## ARKANSAS RIVER BASIN

165

360844098390000 CANTON LAKE CROSS SECTION NO. 3 SITE NO. 3

LOCATION.--Lat 36°08'44", long 98°39'00".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV											
18...	1632	1028	1028	1.00	117000	1620	8.50	14.5	711	10.2	108
18...	1634	1028	1028	5.00	117000	1610	8.50	14.5	711	10.0	105
MAR											
27...	1612	1028	1028	1.00	112000	1800	8.40	15.5	730	8.9	93
27...	1615	1028	1028	5.00	112000	1800	8.40	15.0	730	8.9	93
27...	1618	1028	1028	10.0	112000	1800	8.40	15.0	730	8.9	93
27...	1621	1028	1028	12.0	112000	1800	8.40	15.0	730	8.9	93
JUN											
24...	1245	1028	1028	1.00	113000	1750	8.20	28.5	720	7.9	109
24...	1246	1028	1028	5.00	113000	1780	8.00	26.5	720	8.2	109
24...	1247	1028	1028	10.0	113000	1780	8.00	26.0	720	7.7	101
24...	1248	1028	1028	14.0	113000	1790	8.00	26.0	720	6.3	83
SEP											
15...	1505	1028	1028	1.00	87800	1970	8.20	23.5	720	8.6	108
15...	1506	1028	1028	5.00	87800	1930	8.20	23.5	720	8.8	110
15...	1508	1028	1028	9.00	87800	1960	8.20	23.0	720	8.4	105

## ARKANSAS RIVER BASIN

## 07239000 NORTH CANADIAN RIVER AT CANTON, OK

LOCATION.--Lat 36°04'45", long 98°35'25", in NE 1/4 SW 1/4 sec.33, T.19 N., R.13 W., Blaine County, Hydrologic Unit 11100301, on right bank 2,700 ft downstream from Canton Dam, 1.5 mi northwest of Canton, 4.8 mi upstream from Minnehaha Creek, and at mile 393.6.

DRAINAGE AREA.--12,484 mi<sup>2</sup>, of which 4,883 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311. Gage-height records collected in this vicinity since 1914 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,562.50 ft, U.S. Army Corps of Engineers datum. Oct. 1, 1937 to Jan. 5, 1955, water-stage recorder at site 2.5 mi downstream at datum 1.91 ft lower prior to Oct. 1, 1950 and at datum 6.91 ft lower thereafter.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow partly regulated by Fort Supply Lake (station 07236500) for period May 1942 to April 1948 and completely regulated thereafter by Canton Lake (station 07238500).

AVERAGE DISCHARGE.--(Prior to regulation by Canton Dam) 11 years (water years 1938-48), 256 ft<sup>3</sup>/s, 185,500 acre-ft/yr; (since regulation by Canton Dam) 38 years (water years 1949-86), 154 ft<sup>3</sup>/s, 111,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,800 ft<sup>3</sup>/s, Oct. 12, 1946, gage height, 12.83 ft, site and datum then in use; no flow at times in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 13, 1923, reached a stage of 16.8 ft, at site 300 ft upstream from former site at datum 1.91 ft lower than present datum, from reports of National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 989 ft<sup>3</sup>/s, Sept. 5; gage height, 9.37 ft; minimum daily discharge, 5.7 ft<sup>3</sup>/s, Oct. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	8.3	222	170	79	140	78	49	120	101	29	28
2	7.7	9.3	130	171	79	140	78	50	120	101	29	29
3	7.7	9.4	29	171	79	140	130	51	122	66	29	29
4	7.8	9.2	29	172	178	140	173	48	125	34	28	337
5	6.6	8.9	29	171	249	137	173	44	126	33	28	794
6	5.7	9.4	29	171	272	135	174	39	126	33	29	916
7	6.2	9.2	29	173	270	135	175	39	123	33	29	915
8	6.4	8.9	29	172	269	135	177	41	120	28	29	909
9	7.3	9.0	29	125	266	134	179	44	211	27	29	903
10	7.6	9.6	272	92	266	135	179	42	274	27	29	895
11	7.4	9.4	588	91	263	134	180	37	271	29	29	884
12	7.7	9.0	569	91	259	135	180	38	264	28	29	879
13	7.9	8.9	369	91	255	135	180	40	187	26	29	872
14	8.5	11	176	91	200	136	180	38	104	26	28	867
15	8.3	9.8	173	93	141	137	179	40	104	27	27	859
16	9.4	9.6	172	93	140	138	111	40	103	26	27	851
17	9.5	9.4	171	93	141	145	43	38	103	27	28	845
18	9.8	230	171	93	141	154	43	39	104	27	26	834
19	9.8	501	175	93	142	102	43	136	104	25	24	751
20	9.8	421	176	91	144	70	43	286	105	25	24	695
21	8.9	439	175	91	144	71	42	287	107	22	25	686
22	8.4	460	175	88	142	70	42	290	105	26	25	680
23	8.1	452	169	88	141	70	42	288	103	26	23	659
24	7.9	444	167	86	141	69	42	284	103	26	21	600
25	6.2	436	174	84	141	71	52	285	100	26	21	545
26	6.3	434	171	83	141	72	51	286	102	27	23	318
27	6.8	431	159	82	141	73	52	284	102	26	25	23
28	7.0	423	170	82	140	74	54	280	103	27	27	19
29	7.3	311	170	82	---	74	52	224	103	29	27	18
30	7.7	224	170	83	---	75	50	121	101	29	27	18
31	7.8	---	169	82	---	77	---	120	---	28	26	---
TOTAL	241.2	5364.3	5436	3439	4964	3453	3177	3928	3945	1041	829	17658
MEAN	7.78	179	175	111	177	111	106	127	131	33.6	26.7	589
MAX	9.8	501	588	173	272	154	180	290	274	101	29	916
MIN	5.7	8.3	29	82	79	69	42	37	100	22	21	18
AC-FT	478	10640	10780	6820	9850	6850	6300	7790	7820	2060	1640	35020

CAL YR 1985 TOTAL 20207.8 MEAN 55.4 MAX 704 MIN 2.5 AC-FT 40080  
WTR YR 1986 TOTAL 53475.5 MEAN 147 MAX 916 MIN 5.7 AC-FT 106100

## 167

LOCATION.--Lat 35°48'43", long 98°25'14", NE 1/4, NE 1/4, sec.1, T.15 N., R.12 W., Blaine County, Hydrologic Unit 11100301, on downstream pier on U.S. Highway 281 bridge, 2 mi south of intersection of U.S. Highway 281 and State Highway 33 and at mile 361.2.

PERIOD OF RECORD.--October 1983 to current year.

REMARKS.--Estimated daily discharges: Nov. 15, May 27, July 7-9, and July 11 to Aug. 10, 17-25. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,390 ft<sup>3</sup>/s, Sept. 30, gage height, 16.00 ft; minimum daily discharge, 5.5 ft<sup>3</sup>/s, Oct. 8.

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	9.1	206	184	86	147	53	27	114	84	22	32
2	8.7	9.0	192	184	86	147	67	25	267	87	23	33
3	7.8	9.0	133	184	92	147	69	23	262	85	23	33
4	7.0	9.0	63	182	212	145	100	23	129	79	22	34
5	6.4	9.0	53	182	267	144	150	23	122	59	25	78
6	6.0	9.0	48	184	280	141	154	21	117	48	25	596
7	5.7	8.8	45	182	282	138	160	19	118	88	25	809
8	5.5	8.6	42	181	281	139	139	18	116	58	33	840
9	6.9	8.7	40	187	279	143	160	18	103	41	58	852
10	8.9	8.7	38	149	279	141	162	25	143	33	39	867
11	9.0	8.5	266	119	279	139	162	29	236	31	33	896
12	8.7	8.7	512	114	280	144	162	20	243	29	30	893
13	8.2	9.6	513	110	280	144	162	18	240	29	28	874
14	33	225	300	109	274	143	157	18	220	28	37	904
15	21	113	205	108	272	141	155	19	303	26	54	893
16	13	72	187	107	231	141	151	31	127	25	47	885
17	19	46	184	105	179	143	100	93	102	24	35	888
18	235	36	187	103	167	156	44	43	96	23	30	872
19	26	146	188	102	161	164	36	28	93	22	28	868
20	18	400	204	101	158	108	33	67	88	22	27	765
21	16	372	201	99	153	75	30	167	337	21	27	692
22	15	393	200	97	154	70	29	211	152	21	26	677
23	14	420	197	97	154	67	27	227	150	20	26	672
24	13	417	189	96	151	63	26	235	137	20	25	652
25	12	417	184	92	149	60	25	238	100	20	25	584
26	11	416	190	91	149	60	25	244	90	22	25	533
27	11	417	193	91	147	60	46	254	85	22	25	379
28	10	408	177	91	146	60	39	251	84	22	26	185
29	9.8	404	186	90	---	56	31	249	83	20	27	548
30	9.4	275	186	90	---	54	28	224	80	20	27	2160
31	9.4	---	184	88	---	52	---	137	---	20	28	---
TOTAL	595.4	5092.7	5693	3899	5628	3532	2682	3025	4537	1149	931	19994
MEAN	19.2	170	184	126	201	114	89.4	97.6	151	37.1	30.0	666
MAX	235	420	513	187	282	164	162	254	337	88	58	2160
MIN	5.5	8.5	38	88	86	52	25	18	80	20	22	32
AC-FT	1180	10100	11290	7730	11160	7010	5320	6000	9000	2280	1850	39660
CAL YR 1985	TOTAL 22074.4											
MEAN 1986	TOTAL 56758.1											
MEAN 1986	MEAN 156											

## ARKANSAS RIVER BASIN

07239500 NORTH CANADIAN RIVER NEAR EL RENO, OK

LOCATION.--Lat 35°33'44", long 97°57'32", on east line of sec.32, T.13 N., R.7 W., Canadian County, Hydrologic Unit 11100301, near left bank on downstream side of pier of bridge on old U.S. Highway 81, 2.0 mi north of courthouse in El Reno, 2.2 mi downstream from Target Creek, and at mile 307.4.

DRAINAGE AREA.--13,042 mi<sup>2</sup> of which 4,899 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1902 to April 1908, October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311. Gage-height records collected at site 1.0 mi upstream March 1914 to March 1934 and at present site thereafter are contained in reports of National Weather Service. Published as Canadian River (North Fork) near El Reno 1902-4.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,299.02 ft, National Geodetic Vertical Datum of 1929. October 1902 to April 1908, nonrecording gage at site about 50 ft downstream at different datum.

REMARKS.--Estimated daily discharges: Oct. 3-9, 11-13, Dec. 2-4, Dec. 14, 16, 18, Apr. 19-21, 25-26, 30, May 3-7, July 13-14, 17-24, July 29 to Aug. 4, and Aug. 7 to Sept. 6. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by Fort Supply Lake (station 07236500) for period May 1942 to April 1948 and by Canton Lake (station 07238500) thereafter.

AVERAGE DISCHARGE.--(Prior to regulation by Canton Lake) 16 years (water years 1903-07, 1938-48), 264 ft<sup>3</sup>/s, 191,300 acre-ft/yr; (since regulation by Canton Lake) 38 years (water years 1949-86), 189 ft<sup>3</sup>/s, 136,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,000 ft<sup>3</sup>/s, Oct. 28, 1941, gage height, 15.98 ft; maximum gage height, 18.20 ft, Sept. 21, 1965; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 15, 1923, reached an elevation of 1,326.3 ft above mean sea level at railroad bridge 1.0 mi above station, from reports of National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,010 ft<sup>3</sup>/s, Sept. 29, gage height, 15.91 ft; minimum daily discharge, 7.4 ft<sup>3</sup>/s, Sept. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	131	50	300	153	103	148	45	44	182	115	24	8.8
2	81	48	250	153	104	151	84	36	326	115	22	8.5
3	74	45	200	153	102	151	158	31	590	115	21	8.3
4	66	44	160	153	100	149	121	29	414	111	19	8.0
5	60	43	128	153	98	150	88	27	212	104	186	7.8
6	54	42	109	153	116	150	148	25	173	92	64	7.4
7	47	40	101	153	177	149	156	23	187	82	45	123
8	39	40	96	152	210	147	149	21	183	80	41	370
9	36	40	89	148	216	149	142	57	158	79	37	498
10	34	39	85	146	218	149	141	56	268	75	38	537
11	31	39	75	139	220	147	141	282	249	74	34	562
12	28	40	143	125	223	150	142	132	257	71	29	586
13	26	48	391	119	223	149	144	42	254	66	25	598
14	203	52	290	116	227	151	142	60	245	60	24	600
15	196	473	198	115	226	151	138	637	1860	47	21	631
16	111	357	188	114	211	152	137	156	2690	46	19	642
17	58	161	178	113	180	152	137	2810	1340	45	18	694
18	1030	119	174	112	171	153	136	783	436	44	17	655
19	964	98	169	110	168	153	115	290	266	44	16	633
20	323	101	162	110	162	158	95	170	193	43	15	629
21	163	310	167	109	154	147	75	123	164	42	14	573
22	120	311	169	107	155	117	58	195	232	41	14	477
23	98	324	167	106	159	107	55	241	225	40	13	466
24	81	356	164	106	158	102	49	244	726	40	12	455
25	70	364	157	106	156	95	44	257	226	39	12	444
26	71	370	155	106	155	83	38	253	157	37	11	396
27	75	366	161	104	153	74	128	259	137	38	12	352
28	63	363	161	104	149	67	94	261	127	36	11	256
29	59	359	153	103	---	64	83	253	122	33	9.8	4750
30	55	357	156	102	---	59	56	269	117	29	9.5	7000
31	51	---	155	102	---	54	---	264	---	27	9.0	---
TOTAL	4498	5399	5251	3845	4694	3978	3239	8330	12716	1910	842.3	22975.8
MEAN	145	180	169	124	168	128	108	269	424	61.6	27.2	766
MAX	1030	473	391	153	227	158	158	2810	2690	115	186	7000
MIN	26	39	75	102	98	54	38	21	117	27	9.0	7.4
AC-FT	8920	10710	10420	7630	9310	7890	6420	16520	25220	3790	1670	45570

CAL YR 1985 TOTAL 36650.6 MEAN 100 MAX 1030 MIN 6.0 AC-FT 72700

WTR YR 1986 TOTAL 77678.1 MEAN 213 MAX 7000 MIN 7.4 AC-FT 154100



## 07240000 LAKE HEFNER CANAL NEAR OKLAHOMA CITY, OK

LOCATION.--Lat 35°33'11", long 98°57'11", in SW 1/4 SW 1/4 sec.34, T.13 N., R.4 W., Oklahoma County, Hydrologic Unit 11050002, attached to left wing wall just downstream from outlet of inverted siphon, 2,600 ft upstream from Lake Hefner, 3.0 mi northeast of Bethany, and 7.6 mi northwest of the State Capitol in Oklahoma City.

PERIOD OF RECORD.--March 1944 to current year.

REVISED RECORDS.--WDR OK-80-1: 1968-80 (Datum).

GAGE.--Water stage recorder and concrete control. Datum of gage is 1,196.06 ft, National Geodetic Vertical Datum of 1929 (revised). Prior to Apr. 8, 1947, nonrecording gage at site 2.7 mi upstream at different datum. Apr. 8, 1947 to Apr. 30, 1950, water-stage recorder at site 3.0 mi upstream at different datum. May 1, 1950 to May 19, 1954, Apr. 26, 1957 to Feb. 19, 1968 at present site and datum 4.90 ft higher. May 20, 1954 to Apr. 25, 1957, water-stage recorder and concrete control at site 2,500 ft downstream at datum 2.10 ft higher than present datum.

REMARKS.--Estimated daily discharges: Oct. 28. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Use of canal began in March 1944. Canal diverts water from North Canadian River just upstream from Lake Overholser (station 07240500 and delivers water to Lake Hefner, capacity, 80,600 acre-ft, for municipal water supply of Oklahoma City. Subsequent to April 1950, small ground-water seepage, when head gates are closed, included in records.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 1,500 ft<sup>3</sup>/s, May 28, 1955; no flow at times in each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	379	.71	.45	.36	.31	.00	.00	88	.79	.00	.00	.00
2	86	.69	.35	.33	.29	.00	1.2	88	7.4	.00	.00	.00
3	.59	.67	.37	.33	.31	.00	91	88	.84	.00	.00	.00
4	.31	.67	.42	.26	.32	.00	198	83	.55	.00	.00	.00
5	.27	.70	.41	.30	.32	.00	1.3	4.3	.55	.00	.00	.00
6	.19	.89	.42	.35	.28	.00	.67	.74	.53	.00	.00	.00
7	.14	.91	.45	.23	.42	.00	.54	.61	.67	.00	.00	.00
8	.17	.89	.40	.30	.45	.00	.32	21	.52	.00	.00	.00
9	.10	.84	.43	.37	.27	.00	.34	582	.52	.00	.00	.00
10	1.5	.72	.41	.42	.15	.00	.28	352	.62	.00	.00	.00
11	.32	.76	.35	.43	.42	.00	.21	354	.48	.00	.00	415
12	.52	.84	.45	.39	.27	.25	.25	261	.40	.00	.00	680
13	.18	.90	.48	.39	.32	.28	.26	156	.36	.00	.00	673
14	8.2	2.8	.38	.32	.39	2.6	.17	233	.38	.00	.00	677
15	117	261	.46	.35	.40	.36	.07	910	.59	.00	.00	689
16	280	669	.48	.37	.39	.26	.00	908	.78	.00	.00	700
17	1.3	21	.46	.32	.31	.21	.00	293	.46	.00	.00	718
18	288	3.2	.38	.30	.33	.45	.00	6.0	.36	.00	.00	734
19	701	.88	.38	.35	.30	.08	.33	1.1	.33	.00	.00	732
20	687	.69	.41	.33	.22	.00	.33	.23	.34	.00	.00	690
21	280	.61	.42	.25	.03	.00	.08	.19	.31	.00	.00	630
22	128	.55	.43	.17	.00	.00	.00	.16	.23	.00	.00	630
23	1.7	.51	.43	.23	.18	.00	.00	.13	.22	.00	.00	293
24	1.2	.53	.38	.27	.25	.00	.00	.08	.22	.00	.00	26
25	1.1	.57	.34	.22	.20	.00	.00	.09	.22	.00	.00	24
26	1.1	.48	.49	.19	.13	.00	106	.09	.05	.00	.00	24
27	.85	.44	.49	.17	.03	.00	155	.17	.00	.00	.00	24
28	.78	.44	2.3	.37	.00	.00	88	.36	.00	.00	.00	23
29	.72	.46	.39	.33	---	.00	88	.68	.00	.00	.00	56
30	.68	.61	.40	.36	---	.00	88	.40	.00	.00	.00	24
31	.78	---	.30	.34	---	.00	---	.73	---	.00	.00	---
TOTAL	2968.70	973.96	14.71	9.70	7.29	4.49	820.35	4433.05	18.72	.00	.00	8462.00
MEAN	95.8	32.5	.47	.31	.26	.14	27.3	143	.62	.000	.000	282
MAX	701	669	2.3	.43	.45	2.6	198	910	7.4	.00	.00	734
MIN	.10	.44	.30	.17	.00	.00	.00	.08	.00	.00	.00	.00
AC-FT	5890	1930	29	19	14	8.9	1630	8790	37	.00	.00	16780

CAL YR 1985 TOTAL 13225.15 MEAN 36.2 MAX 954 MIN .00 AC-FT 26230  
WTR YR 1986 TOTAL 17712.90 MEAN 48.5 MAX 910 MIN .00 AC-FT 35130

## ARKANSAS RIVER BASIN

## 07240500 LAKE OVERHOLSER NEAR OKLAHOMA CITY, OK

LOCATION.--Lat 35°29'11", long 97°39'58", on north line of SW 1/4 sec.30, T.12 N., R.4 W., Oklahoma County, Hydrologic Unit 11100301, at control tower at left end of dam on North Canadian River, 2.9 mi upstream from Mustang Creek, 9.0 mi west of State Capitol in Oklahoma City, and at mile 281.5.

DRAINAGE AREA.--13,221 mi<sup>2</sup>, of which 4,899 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1937 to current year.

GAGE.--Nonrecording gage. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by Oklahoma City Water Department). Prior to Oct. 1, 1955, at same site at datum, 1,065.77 ft elevation. Oct. 1, 1955 to Sept. 30, 1962, water-stage recorder at same site and present datum.

REMARKS.--Reservoir is formed by Ambursen-type dam flanked by long earth-fill sections. Outlet facilities are twenty-three taintor gates and one uncontrolled spillway. Storage began in 1917. Dam was partly washed out in 1923 and rebuilt in 1924. Capacity, 17,100 acre-ft below elevation 1,242.27 ft, top of spillway gates. Dead storage, 1,400 acre-ft below elevation 1,229.77 ft, sill of outlet works. Figures given herein represent total contents. Water diverted for municipal water supply by Oklahoma City. Revised capacity table used since Oct. 1, 1950.

COOPERATION.--Elevations and capacity table furnished by Oklahoma City Water Department.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 20,900 acre-ft, June 14, 1944, elevation, 1,242.67 ft, from from capacity table then in use; minimum observed, 1,870 acre-ft, May 14, 1955, elevation, 1,230.62 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 17,080 acre-ft, May 19, elevation, 1,242.25 ft; minimum, 10,010 acre-ft, Sept. 9, elevation, 1,237.60 ft.

## MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1240.20	13,950	-
Oct. 31.....	1241.30	15,630	+1,680
Nov. 30.....	1241.30	15,630	0
Dec. 31.....	1241.00	15,170	-460
CAL YR 85.....	-	-	-1,210
Jan. 31.....	1241.05	15,240	+70
Feb. 28.....	1240.90	15,020	-220
Mar. 31.....	1240.65	14,630	-390
Apr. 30.....	1240.85	14,940	+310
May 31.....	1241.55	16,010	+1,070
June 30.....	1241.80	16,390	+380
July 31.....	1239.30	12,580	-3,810
Aug. 31.....	1238.00	10,610	-1,970
Sept. 30.....	1240.00	13,640	+3,030
WTR YR 86.....	-	-	-310

ARKANSAS RIVER BASIN

171

07241000 NORTH CANADIAN RIVER BELOW LAKE OVERHOLSER, NEAR OKLAHOMA CITY, OK

LOCATION.--Lat 35°28'46", long 97°39'47", in SE 1/4 SW 1/4 sec.30, T.12 N., R.4 W., Oklahoma County, Hydrologic Unit 11100301, on left bank 200 ft upstream from bridge on State Highway 4, 0.5 mi downstream from Lake Overholser, 2.4 mi upstream from Mustang Creek, 9.1 mi southwest of State Capitol in Oklahoma City, and at mile 281.0.

DRAINAGE AREA.--13,222 mi<sup>2</sup>, of which 4,899 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1952 to September 1968, October 1969 to September 1972, October 1973 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,194.66 ft, National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1961, at datum 10.00 ft higher and through Mar. 24, 1971, at site 200 ft downstream.

REMARKS.--Estimated daily discharges: Nov. 30 to Dec. 9, and Dec. 11 to Jan. 20. Records fair. Some regulation by Canton Lake (station 07238500) and Lake Overholser (station 07240500). Diversions above station into Lake Overholser and Lake Hefner Canal (station 07240000). Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--32 years, 106 ft<sup>3</sup>/s, 76,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,700 ft<sup>3</sup>/s, Nov. 3, 1974, gage height, 29.18 ft; no flow at times in 1952-57.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 40.9 ft, present datum, was reached in October 1923 from information by Oklahoma State Highway Department.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,230 ft<sup>3</sup>/s, Sept. 30, gage height, 25.66 ft; minimum daily discharge, 1.10 ft<sup>3</sup>/s, Oct. 7-9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	84	370	264	105	150	81	4.0	222	133	21	34
2	1.8	80	365	265	106	143	140	3.2	218	133	19	33
3	1.7	80	360	245	106	143	160	3.2	419	120	18	34
4	6.1	57	300	242	106	156	22	3.2	192	89	18	48
5	1.3	45	220	239	108	201	15	3.2	142	103	111	76
6	1.2	57	132	236	108	178	12	3.2	35	115	124	75
7	1.1	45	110	230	158	143	11	3.2	277	115	31	166
8	1.1	45	105	225	241	125	196	11	187	88	31	59
9	1.1	46	101	220	239	129	255	17	165	67	32	60
10	4.5	51	98	220	237	138	151	34	242	50	32	13
11	3.0	53	94	218	235	167	94	22	319	53	29	13
12	2.3	72	91	191	235	186	141	8.0	180	63	29	13
13	2.7	73	87	195	235	183	192	5.5	163	64	30	13
14	25	93	430	190	256	154	177	46	198	65	30	14
15	6.5	176	360	210	236	139	90	95	345	65	29	14
16	2.9	13	300	200	236	139	126	29	1490	65	29	13
17	3.7	259	262	193	224	135	153	2420	3360	56	29	15
18	76	138	255	192	159	186	154	2930	704	33	40	14
19	14	52	254	190	137	189	155	941	23	9.3	50	14
20	14	13	252	200	151	147	155	369	24	9.7	50	14
21	6.4	177	255	230	127	124	117	304	139	15	42	14
22	104	300	250	155	144	125	34	256	215	31	38	14
23	133	312	249	133	164	128	4.5	236	382	31	38	14
24	115	297	246	100	165	129	4.5	231	1010	31	33	14
25	98	356	239	113	165	112	4.5	229	845	31	32	14
26	98	383	245	123	165	78	4.4	228	339	32	32	17
27	96	293	272	107	179	79	8.8	227	199	33	34	18
28	90	308	270	107	161	108	5.7	226	200	33	33	155
29	94	336	270	107	---	141	4.3	225	167	33	33	2890
30	107	380	272	105	---	142	4.2	223	133	27	33	6580
31	83	---	269	105	---	102	---	222	---	22	34	---
TOTAL	1196.9	4674	7383	5750	4888	4399	2671.9	9557.7	12534	1815.0	1164	10465
MEAN	38.6	156	238	185	175	142	89.1	308	418	58.5	37.5	349
MAX	133	383	430	265	256	201	255	2930	3360	133	124	6580
MIN	1.1	13	87	100	105	78	4.2	3.2	23	9.3	18	13
AC-FT	2370	9270	14640	11410	9700	8730	5300	18960	24860	3600	2310	20760

CAL YR 1985 TOTAL 57578.7 MEAN 158 MAX 3390 MIN 1.1 AC-FT 114200  
WTR YR 1986 TOTAL 66498.5 MEAN 182 MAX 6580 MIN 1.1 AC-FT 131900

LOCATION.--Lat 35°30'08", long 97°10'52", in SW 1/4 NE 1/4 sec.22, T.12 N., R.1 E., Oklahoma County, Hydrologic Unit 11100302, on upstream left end of bridge on access road to O.G. & E. power plant, 1.8 mi northwest of Harrah, 4.6 mi downstream from Choctaw Creek, and at mile 229.2.

WATER-DISCHARGE RECORDS

GAGE---Water-stage recorder. Datum of gage is 1,055.69 ft National Geodetic Vertical Datum of 1929.  
Prior to June 19, 1981, gage 0.8 mi upstream at same datum.

AVERAGE DISCHARGE.--18 years, 318 ft<sup>3</sup>/s, 230,400 acre-ft/yr.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,440 ft<sup>3</sup>/s, Sept. 30, stage rising, peak occurred Oct. 4, 1986; maximum peak discharge, 4,730 ft<sup>3</sup>/s, May 18, gage height, 12.97 ft; minimum daily discharge, 125 ft<sup>3</sup>/s, Oct 9.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	326	260	548	344	256	321	250	168	502	376	149	146
2	204	252	617	340	257	302	203	144	580	369	158	380
3	170	244	502	321	256	281	515	142	671	362	150	244
4	155	236	386	307	261	267	2050	133	680	357	140	212
5	138	231	329	321	251	281	660	126	666	305	135	223
6	134	216	331	314	252	347	399	129	638	286	130	313
7	128	227	365	321	268	348	316	127	385	315	200	279
8	128	229	359	313	315	306	267	132	752	326	160	284
9	125	209	352	296	430	272	268	143	542	311	156	277
10	132	202	285	297	415	250	496	347	507	241	140	252
11	496	199	258	303	404	285	400	804	449	216	180	220
12	244	211	312	308	409	866	311	535	625	218	250	339
13	235	285	322	305	411	576	283	228	455	217	160	204
14	1200	840	346	305	412	399	357	288	390	219	126	171
15	908	2110	473	305	441	359	360	3000	610	222	138	201
16	327	1320	402	319	421	317	262	1270	803	211	213	242
17	235	501	456	307	413	309	235	2800	1290	203	165	183
18	1610	524	434	274	401	359	309	4520	2510	217	147	524
19	2080	826	366	263	368	521	327	3380	1310	192	147	328
20	584	391	412	252	323	388	596	1290	446	168	153	220
21	387	321	412	260	309	328	451	882	372	148	155	195
22	333	297	416	325	296	297	341	720	367	149	157	182
23	316	492	412	317	293	278	247	641	436	151	148	180
24	371	501	369	249	341	263	173	571	917	162	147	190
25	347	494	273	241	344	264	153	550	1000	164	143	180
26	445	515	289	258	334	254	147	539	967	161	151	195
27	372	558	289	275	312	212	152	715	717	164	159	300
28	304	475	289	276	316	196	598	733	448	167	377	200
29	281	479	331	263	---	190	306	564	465	158	204	500
30	275	491	345	261	---	245	175	523	403	158	151	4000
31	280	---	344	258	---	255	---	502	---	158	141	---
TOTAL	13270	14136	11624	9098	9509	10136	11607	26646	20903	7071	5130	11364
MEAN	428	471	375	293	340	327	387	860	697	228	165	379
MAX	2080	2110	617	344	441	866	2050	4520	2510	376	377	4000
MIN	125	199	258	241	251	190	147	126	367	148	126	146
AC-FT	26320	28040	23060	18050	18860	20100	23020	52850	41460	14030	10180	22540
CAL YR 1985 WTR YR 1986	TOTAL 150494	MEAN 535 412	MAX 5770 4520	MIN 125 125	AC-FT 387400 AC-FT 298500							

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1968 to current year.

WATER TEMPERATURE: October 1968 to current year.

REMARKS.--Samples were collected by a local observer on a daily basis. Partial analyses were made on those samples on or near the 5th, 15th, and 25th of each month. Additional samples were collected biweekly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,700 microsiemens, Sept. 25, 1980; minimum daily, 262 microsiemens, June 9, 1974.

WATER TEMPERATURE: Maximum daily, 36.0 °C, July 11, 1982; minimum daily, 0.0 °C on several days during winter periods.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,770 microsiemens, Mar. 8; minimum daily, 289 microsiemens, May 17.

WATER TEMPERATURE: Maximum daily, 34.0 °C, Aug. 21; minimum daily, 0.0 °C on several days during winter period.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)
OCT											
05...	1858	1028	80020	--	131	1500	7.30	--	23.0	--	--
15...	1830	1028	80020	--	563	508	7.40	--	19.0	--	--
16...	1100	1028	80020	--	324	719	7.50	19.5	17.0	740	6.9
25...	1831	1028	80020	--	336	1020	7.30	--	21.0	--	--
31...	1200	1028	80020	3.93	292	1340	7.70	17.0	14.5	730	8.2
NOV											
05...	2003	1028	80020	--	222	1430	7.90	--	15.0	--	--
15...	2050	1028	80020	--	3030	350	7.50	--	11.0	--	--
18...	1400	1028	80020	--	593	958	7.60	24.0	16.5	730	6.1
25...	1100	1028	80020	--	506	1490	7.80	5.0	7.0	730	10.0
25...	1710	1028	80020	--	490	1410	7.60	--	12.0	--	--
DEC											
06...	1815	1028	80020	--	330	1440	8.10	--	0.0	--	--
09...	1200	1028	80020	--	353	1520	7.70	16.0	8.0	730	7.3
10...	1945	1028	80020	--	264	1360	7.30	--	8.0	--	--
23...	1200	1028	80020	--	425	1730	7.70	17.0	6.0	730	11.2
25...	1850	1028	80020	--	260	1470	7.40	--	1.5	--	--
JAN											
05...	1820	1028	80020	--	334	1450	7.90	--	6.5	--	--
15...	1630	1028	80020	--	313	1470	7.00	--	9.0	--	--
23...	1200	1028	80020	--	333	1780	7.80	7.0	4.0	740	9.8
29...	--	1028	80020	--	263	1560	6.90	--	11.0	--	--
FEB											
05...	1706	1028	80020	--	250	1520	7.70	--	12.5	--	--
15...	1700	1028	80020	--	450	1550	7.00	--	8.0	--	--
21...	1200	1028	80020	--	317	--	7.60	3.0	8.0	740	7.4
25...	1820	1028	80020	--	334	1530	7.00	--	17.5	--	--
26...	1200	1028	80020	--	343	1740	7.80	25.5	15.0	730	9.5
MAR											
05...	1759	1028	80020	--	280	1610	7.10	--	15.0	--	--
16...	1739	1028	80020	--	319	1470	7.20	--	16.5	--	--
19...	1200	1028	80020	--	533	999	7.60	6.0	13.5	740	8.1
25...	1835	1028	80020	--	270	1490	7.00	--	19.0	--	--
31...	1430	1028	80020	--	272	1550	7.80	26.0	21.5	730	9.1
APR											
01...	1843	1028	80020	--	238	1520	7.80	--	--	--	--
17...	1700	1028	80020	--	234	1650	7.20	--	20.5	--	--
25...	2138	1028	80020	--	151	575	7.50	--	23.0	--	--
30...	1100	1028	80020	--	189	--	7.40	24.0	21.5	730	8.1
MAY											
05...	1740	1028	80020	--	131	1320	7.30	--	26.0	--	--
15...	1710	1028	80020	--	3850	402	6.70	--	24.5	--	--
19...	1400	1028	80020	--	3780	479	6.90	24.5	19.0	740	5.3
25...	1714	1028	80020	--	563	1090	7.00	--	24.0	--	--
30...	1100	1028	80020	--	538	1650	7.60	24.0	21.5	740	7.4
JUN											
05...	1800	1028	80020	--	621	1020	7.90	--	21.0	--	--
13...	1100	1028	80020	--	466	1310	7.90	29.5	25.0	740	7.7
15...	1605	1028	80020	--	714	1150	7.80	--	27.0	--	--
25...	1902	1028	80020	--	1020	787	7.90	--	30.0	--	--
30...	1100	1028	80020	--	407	1110	8.00	29.5	28.0	730	7.9

## ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)
JUL											
02...	1735	1028	80020	--	368	1340	8.00	--	30.5	--	--
15...	1609	1028	80020	--	225	983	7.30	--	27.0	--	--
17...	1130	1028	80020	--	201	1360	8.00	29.0	27.5	740	6.4
25...	2030	1028	80020	--	159	1500	8.10	--	31.5	--	--
AUG											
01...	1215	1028	80020	--	149	1070	8.30	34.0	28.5	730	4.8
11...	1835	1028	80020	--	180	807	8.10	--	29.0	--	--
14...	1230	1028	80020	--	115	1020	7.60	28.0	26.5	730	5.8
26...	1900	1028	80020	--	160	1250	7.60	--	29.0	--	--
30...	2000	1028	80020	--	147	1080	7.70	--	25.0	--	--
SEP											
05...	1930	1028	80020	--	208	1020	7.40	--	25.0	--	--
15...	1721	1028	80020	--	203	1220	7.80	--	29.0	--	--
18...	1430	1028	80020	--	590	531	6.70	28.0	26.5	740	7.5
25...	2049	1028	80020	--	180	1250	7.40	--	28.0	--	--



## ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	NITRO- GEN DIS- SOLVED (MG/L AS N)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	COLI- FORM, TOTAL, IMMED. (COLS./ PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
OCT											
05...	--	--	--	--	--	--	--	300	110	79	25
15...	--	--	--	--	--	--	--	140	41	41	9.3
16...	74	3.8	45	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	260	92	69	21
31...	84	4.7	46	12	41000	K160	K50	--	--	--	--
NOV											
05...	--	--	--	--	--	--	--	350	120	89	32
15...	--	--	--	--	--	--	--	110	22	34	7.0
18...	65	--	44	14	--	--	--	--	--	--	--
25...	86	--	40	5.0	K115000	K10000	3400	--	--	--	--
25...	--	--	--	--	--	--	--	370	190	89	36
DEC											
06...	--	--	--	--	--	--	--	370	160	90	35
09...	65	--	51	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	340	130	84	32
23...	94	--	44	--	>80000	48000	74000	--	--	--	--
25...	--	--	--	--	--	--	--	380	160	92	36
JAN											
05...	--	--	--	--	--	--	--	400	190	97	38
15...	--	--	--	--	--	--	--	380	170	94	36
23...	77	--	39	--	2800	--	K200	--	--	--	--
29...	--	--	--	--	--	--	--	390	160	96	36
FEB											
05...	--	--	--	--	--	--	--	370	150	92	35
15...	--	--	--	--	--	--	--	390	200	96	36
21...	--	--	46	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	390	180	96	37
26...	99	--	47	--	K80500	27000	--	--	--	--	--
MAR											
05...	--	--	--	--	--	--	--	410	180	100	38
16...	--	--	--	--	--	--	--	390	170	97	36
19...	80	--	76	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	380	160	93	37
31...	108	--	25	--	--	--	--	--	--	--	--
APR											
01...	--	--	--	--	--	--	--	400	160	96	38
17...	--	--	--	--	--	--	--	390	160	98	36
25...	--	--	--	--	--	--	--	150	0	43	11
30...	--	--	43	11	52500	K900	K600	--	--	--	--
MAY											
05...	--	--	--	--	--	--	--	290	76	73	27
15...	--	--	--	--	--	--	--	130	14	38	7.4
19...	59	--	65	11	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	300	80	76	27
30...	87	--	24	12	775000	2500	9000	--	--	--	--
JUN											
05...	--	--	--	--	--	--	--	270	97	68	24
13...	97	--	26	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	310	110	77	28
25...	--	--	--	--	--	--	--	220	86	56	19
30...	106	--	36	--	--	--	--	--	--	--	--
JUL											
02...	--	--	--	--	--	--	--	360	140	93	32
15...	--	--	--	--	--	--	--	180	35	45	17
17...	84	--	46	--	4000	K250	K150	--	--	--	--
25...	--	--	--	--	--	--	--	340	120	84	32
AUG											
01...	65	--	61	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	200	87	52	18
14...	76	--	27	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	310	130	77	29
30...	--	--	--	--	--	--	--	250	97	63	23
SEP											
05...	--	--	--	--	--	--	--	230	72	56	21
15...	--	--	--	--	--	--	--	270	100	64	27
18...	96	--	64	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	270	82	67	24

## ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
OCT											
05...	180	55	5	13	--	--	--	18	110	280	882
15...	46	41	2	5.0	--	--	--	7.7	37	67	300
16...	--	--	--	--	200	0	164	10	--	--	394
25...	100	45	3	7.3	--	--	--	16	94	160	576
31...	--	--	--	--	300	0	246	9.5	--	--	747
NOV											
05...	160	49	4	8.5	--	--	--	5.6	160	240	868
15...	27	33	1	3.7	--	--	--	5.6	20	37	206
18...	--	--	--	--	262	0	215	10	--	--	520
25...	--	--	--	--	234	0	192	5.9	--	200	841
25...	150	46	3	7.6	--	--	--	8.6	230	220	871
DEC											
06...	150	46	4	8.3	--	--	--	3.2	210	230	991
09...	--	--	--	--	273	0	224	8.7	--	--	862
10...	140	46	3	8.3	--	--	--	21	170	210	816
23...	--	--	--	--	268	0	220	8.5	--	--	920
25...	150	46	3	8.0	--	--	--	17	220	230	888
JAN											
05...	160	46	4	8.2	--	--	--	5.1	230	230	937
15...	150	45	3	8.4	--	--	--	40	220	210	900
23...	--	--	--	--	228	0	--	5.7	--	270	985
29...	160	47	4	9.0	--	--	236	56	210	230	923
FEB											
05...	170	49	4	8.0	--	--	--	8.8	210	230	920
15...	160	47	4	7.3	--	--	--	36	260	240	953
21...	--	--	--	--	278	0	228	11	--	240	925
25...	170	48	4	7.6	--	--	--	41	240	240	953
26...	--	--	--	--	268	0	220	6.7	--	240	954
MAR											
05...	160	46	4	8.2	--	--	--	34	230	240	972
16...	160	47	4	7.1	--	--	--	27	210	220	894
19...	--	--	--	--	229	0	188	9.1	--	--	554
25...	150	45	3	8.8	--	--	--	43	210	220	899
31...	--	--	--	--	302	0	248	7.6	--	210	931
APR											
01...	170	48	4	9.5	--	--	--	7.3	190	210	944
17...	180	49	4	10	--	--	--	28	190	260	1000
25...	52	42	2	4.6	--	--	--	9.5	47	67	343
30...	--	--	--	--	229	0	188	14	--	--	525
MAY											
05...	150	52	4	9.4	--	--	--	21	130	200	773
15...	27	31	1	4.2	--	--	--	43	30	38	228
19...	--	--	--	--	151	0	124	30	--	--	283
25...	97	40	3	7.9	--	--	--	43	160	120	657
30...	--	--	--	--	268	0	220	11	--	200	844
JUN											
05...	95	43	3	8.3	--	--	--	4.2	150	130	612
13...	--	--	--	--	249	0	204	5.0	--	--	796
15...	120	45	3	9.0	--	--	--	6.0	150	150	705
25...	72	41	2	8.6	--	--	--	3.2	120	87	475
30...	--	--	--	--	215	0	176	3.4	--	150	664
JUL											
02...	140	45	3	12	--	--	--	4.3	180	190	833
15...	130	61	4	1.0	--	--	--	14	110	130	570
17...	--	--	--	--	210	0	172	3.3	--	--	856
25...	170	51	4	13	--	--	--	3.4	150	240	893
AUG											
01...	--	--	--	--	256	2.4	214	2.0	--	--	770
11...	85	46	3	7.7	--	--	--	1.8	95	110	567
14...	--	--	--	--	229	0	188	9.1	--	160	655
26...	160	52	4	10	--	--	--	8.7	150	200	956
30...	130	52	4	9.9	--	--	--	6.0	120	170	780
SEP											
05...	120	52	4	9.0	--	--	--	12	120	150	608
15...	140	52	4	9.9	--	--	--	5.2	140	190	830
18...	--	--	--	--	224	0	184	71	--	77	--
25...	150	53	4	14	--	--	--	14	130	200	822

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDED (MG/L)	SOLIDS, VOL-A- TILE, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)
OCT											
05...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
16...	262	71	1.46	6.6	0.340	1.1	1.80	0.870	1.1	1.1	2.0
25...	--	--	--	--	--	--	--	--	--	--	--
31...	82	73	3.05	14	0.250	0.82	3.30	0.530	0.68	0.87	1.4
NOV											
05...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
18...	176	106	1.47	--	0.230	0.76	1.70	1.50	1.9	0.80	2.3
25...	130	70	1.33	--	0.170	0.56	1.50	1.20	1.5	0.70	1.9
25...	--	--	--	--	--	--	--	--	--	--	--
DEC											
06...	--	--	--	--	--	--	--	--	--	--	--
09...	70	68	1.11	--	0.190	0.62	1.30	2.80	3.6	0.90	3.7
10...	--	--	--	--	--	--	--	--	--	--	--
23...	80	86	0.710	--	0.130	0.43	0.840	3.00	3.9	0.60	3.6
25...	--	--	--	--	--	--	--	--	--	--	--
JAN											
05...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
23...	3	83	0.560	--	0.110	0.36	0.670	3.10	4.0	1.0	4.1
29...	--	--	--	--	--	--	--	--	--	--	--
FEB											
05...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
21...	46	143	0.790	--	0.160	0.53	0.950	4.00	5.2	--	--
25...	--	--	--	--	--	--	--	--	--	--	--
26...	89	137	0.840	--	0.260	0.85	1.10	3.30	4.3	0.90	4.2
MAR											
05...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
19...	512	93	0.930	--	0.170	0.56	1.10	1.60	2.1	1.1	2.7
25...	--	--	--	--	--	--	--	--	--	--	--
31...	33	133	0.940	--	0.460	1.5	1.40	2.50	3.2	1.0	3.5
APR											
01...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--
30...	106	102	2.76	--	0.640	2.1	3.40	2.40	3.1	0.90	3.3
MAY											
05...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
19...	604	63	0.490	--	0.060	0.20	0.550	0.180	0.23	0.32	0.50
25...	--	--	--	--	--	--	--	--	--	--	--
30...	55	748	1.48	--	0.120	0.39	1.60	0.260	0.33	0.74	1.0
JUN											
05...	--	--	--	--	--	--	--	--	--	--	--
13...	121	709	1.26	--	0.140	0.46	1.40	0.120	0.15	0.58	0.70
15...	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--
30...	97	116	1.47	--	0.030	0.10	1.50	0.050	0.06	0.65	0.70
JUL											
02...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
17...	62	145	1.88	--	0.020	0.07	1.90	0.030	0.04	0.87	0.90
25...	--	--	--	--	--	--	--	--	--	--	--
AUG											
01...	44	135	3.61	--	0.190	0.62	3.80	1.00	1.3	1.7	2.7
11...	--	--	--	--	--	--	--	--	--	--	--
14...	25	543	4.31	--	0.590	1.9	4.90	0.370	0.48	0.63	1.0
26...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
SEP											
05...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
18...	378	--	0.760	--	0.240	0.79	1.00	0.620	0.80	2.5	3.1
25...	--	--	--	--	--	--	--	--	--	--	--

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS P04)	ARSENIC DIS-SOLVED (UG/L AS AS)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
OCT										
05...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
16...	--	1.20	1.00	3.1	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
31...	--	2.00	1.70	5.2	--	--	--	--	--	--
NOV										
05...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
18...	1.30	1.10	1.00	3.1	4	<1	<10	4	26	<1
25...	--	0.970	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
DEC										
06...	--	--	--	--	--	--	--	--	--	--
09...	--	1.70	1.40	4.3	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
23...	--	1.10	1.10	3.4	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
JAN										
05...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
23...	--	1.20	1.40	4.3	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
FEB										
05...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
26...	--	--	2.10	6.4	3	<1	<10	1	60	<1
MAR										
05...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
19...	--	0.560	0.470	1.4	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
31...	--	1.50	1.20	3.7	--	--	--	--	--	--
APR										
01...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
30...	--	2.30	1.90	5.8	--	--	--	--	--	--
MAY										
05...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
19...	--	0.340	0.290	0.89	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
30...	--	0.880	0.870	2.7	4	<1	<10	1	20	5
JUN										
05...	--	--	--	--	--	--	--	--	--	--
13...	--	0.800	0.790	2.4	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
30...	--	1.60	1.50	4.6	--	--	--	--	--	--
JUL										
02...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
17...	--	1.80	1.50	4.6	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
AUG										
01...	--	2.90	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--
14...	--	2.50	2.40	7.4	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--
SEP										
05...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
18...	--	1.20	1.10	3.4	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[illegible]

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

## PHYTOPLANKTON ANALYSES, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	MAR 31, 86
TIME	1430
TOTAL CELLS/ML	31000
	CELLS PER- /ML CENT

CHLOROPHYTA (GREEN ALGAE)	
.CHLOROPHYCEAE	
..CHLOROCOCCALES	
...OOCYSTACEAE	
....ANKISTRODESMUS	2000 6
....CHLORELLA	7300 24
....SELENASTRUM	980 3
...SCENEDESMACEAE	
....SCENEDESMUS	3100 10
..VOLVOCEAE	
...VOLVOCEAE	
....GONIUM	200 <1
..ZYGNEMATALES	
...DESMIDIACEAE	
....CLOSTERIUM	590 2
CHRYSTOPHYTA (YELLOW-GREEN ALGAE)	
.BACILLARIOPHYCEAE	
..PENNALES	
...NAVICULACEAE	
....NAVICULA	1600 5
CYANOPHYTA (BLUE-GREEN ALGAE)	
.CYANOPHYCEAE	
..CHROOCOCCALES	
...CHROOCOCCACEAE	
....AGHENELLUM	
.....A. QUADRUPPLICATUM	1200 4
....ANACYSTIS	14000 45

DATE	APR 30, 86
TIME	1100
TOTAL CELLS/ML	23000
	CELLS PER- /ML CENT

CHLOROPHYTA (GREEN ALGAE)	
.CHLOROPHYCEAE	
..CHLOROCOCCALES	
...BOTRYOCOCCACEAE	
....BOTRYOCOCCUS	400 2
...OOCYSTACEAE	
....ANKISTRODESMUS	1200 5
....CHLORELLA	3300 14
CHRYSTOPHYTA (YELLOW-GREEN ALGAE)	
.BACILLARIOPHYCEAE	
..PENNALES	
...FRAGILARIACEAE	
....FRAGILARIA	590 3
...NAVICULACEAE	
....NAVICULA	1600 7
CYANOPHYTA (BLUE-GREEN ALGAE)	
.CYANOPHYCEAE	
..CHROOCOCCALES	
...CHROOCOCCACEAE	
....ANACYSTIS	15000 65
...OSCILLATORIALES	
...OSCILLATORIALES	
....OSCILLATORIA	980 4



## ARKANSAS RIVER BASIN

181

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

PHYTOPLANKTON ANALYSES, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	MAY 30, 86
TIME	1100

TOTAL CELLS/ML	40000
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CELLS PER-	
/ML CENT	

## CHLOROPHYTA (GREEN ALGAE)

.CHLOROPHYCEAE		
..CHLOROCOCCALES		
...OOCYSTACEAE		
....ANKISTRODESMUS	5100	13
....CHLORELLA	3000	8
....OOCYSTIS	400	1
...SCENEDESMACEAE		
....SCENEDESMUS	4900	12
..ZYGNEMATALES		
...DESMIDIACEAE		
....STAUSTRUM	400	1
...ZYGNEMATAACEAE		
....SPIROGYRA	200	<1

## CHRYSTOPHYTA (YELLOW-GREEN ALGAE)

.BACILLARIOPHYCEAE		
..PENNALES		
...FRAGILARIACEAE		
....SYNEDRA	400	1
...NAVICULACEAE		
....GYROSIGMA	200	<1
....NAVICULA	1600	4

## CYANOPHYTA (BLUE-GREEN ALGAE)

.CYANOPHYCEAE		
..CHROOCOCCALES		
...CHROOCOCCACEAE		
....AGMENELLUM		
....ANACYSTIS	20000	50
...OSCILLATORIALES		
....OSCILLATORIA	400	1

## EUGLENOPHYTA (EUGLENOIDS)

.EUGLENOPHYCEAE		
..EUGLENALES		
...EUGLENACEAE		
....EUGLENA	980	2

DATE	JUN 30, 86
TIME	1100

TOTAL CELLS/ML	27000
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CELLS PER-	
/ML CENT	

## CHLOROPHYTA (GREEN ALGAE)

.CHLOROPHYCEAE		
..CHLOROCOCCALES		
...HYDRODICTYACEAE		
....PEDIASTRUM	200	<1
...OOCYSTACEAE		
....ANKISTRODESMUS	2600	10
....OOCYSTIS	200	<1
...SCENEDESMACEAE		
....SCENEDESMUS	4800	18
..VOLVOCALES		
...CHLAMYDOMONADACEAE		
....CHLAMYDOMONAS	1800	7
...VOLVOCAACEAE		
....GONIUM	400	1
....PLEODORINA	400	1

## CHRYSTOPHYTA (YELLOW-GREEN ALGAE)

.BACILLARIOPHYCEAE		
..PENNALES		
...NAVICULACEAE		
....NAVICULA	600	2

## CYANOPHYTA (BLUE-GREEN ALGAE)

.CYANOPHYCEAE		
..CHROOCOCCALES		
...CHROOCOCCACEAE		
....AGMENELLUM		
....ANACYSTIS	12000	44
...OSCILLATORIALES		
....OSCILLATORIA	1400	5

## EUGLENOPHYTA (EUGLENOIDS)

.EUGLENOPHYCEAE		
..EUGLENALES		
...EUGLENACEAE		
....EUGLENA	1400	5

## ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

PHYTOPLANKTON ANALYSES, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	AUG 14, 86
TIME	1230
TOTAL CELLS/ML	17000
	CELLS PER- /ML CENT
CHLOROPHYTA (GREEN ALGAE)	
..CHLOROPHYCEAE	
...CHLOROCOCCALES	
...HYDRODICTYACEAE	
....PEDIASTRUM	200 1
...OOCYSTACEAE	
....ANKISTRODESMUS	400 2
...SCENEDESMACEAE	
....SCENEDESMUS	5000 29
..VOLVOCALES	
...CHLAMYDOMONADACEAE	
....CHLAMYDOMONAS	2000 12
...VOLVOCAEAE	
....PLEODORINA	200 1
CHRYSTOPHYTA (YELLOW-GREEN ALGAE)	
..BACILLARIOPHYCEAE	
...CENTRALES	
....COSCINODISCACEAE	
....CYCLOTELLA	1000 6
...PENNALES	
....NAVICULACEAE	
....NAVICULA	600 4
CYANOPHYTA (BLUE-GREEN ALGAE)	
..CYANOPHYCEAE	
...CHROOCOCCALES	
...CHROOCOCCACEAE	
....ANACYSTIS	6200 36
...OSCILLATORIALES	
...OSCILLATORIAEAE	
....OSCILLATORIA	1000 6

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	734	1310	1390	1520	1580	1540	1520	---	1440	1280	---	1120
2	974	1410	1390	1530	1530	1530	1430	1290	1340	1340	---	709
3	1180	1400	1440	1520	1500	1560	---	1330	1170	---	---	839
4	1350	1420	1530	1550	1490	1580	---	1310	1260	---	---	1100
5	1500	1430	1520	1560	1520	1610	---	1320	1020	---	---	1020
6	1500	1410	1440	1450	1530	1650	---	1380	883	---	---	1010
7	1510	1440	1490	1550	1270	---	---	1420	995	1510	---	1060
8	1550	1460	1470	1520	1440	1770	---	1400	768	1480	---	1200
9	1590	1430	1420	1530	---	1590	---	---	1000	1490	---	1230
10	1510	1400	1360	1520	1490	---	1630	---	914	1560	---	1280
11	---	1360	1530	1490	1510	1510	1640	---	1210	1460	807	1290
12	878	1330	1530	1510	1560	751	1410	683	---	1500	846	950
13	868	1080	1520	1470	1590	1110	1480	864	---	1540	1040	1080
14	338	522	1540	1460	1560	1400	1550	624	---	1030	---	1140
15	508	350	1530	1470	1570	---	1600	402	1140	983	---	1220
16	785	488	1520	1470	1550	1470	1580	531	753	1130	---	1040
17	1030	822	1500	1480	1520	1480	1650	289	764	1330	---	1130
18	626	981	---	1460	1530	1430	1690	539	715	1330	1120	572
19	630	600	---	1460	1510	1010	1520	512	777	1330	1110	860
20	626	809	---	1480	1520	1410	951	568	883	1330	1170	1060
21	889	946	---	1430	1540	1480	1130	700	1030	1320	1200	1150
22	1090	866	---	1550	1460	1490	1350	814	1210	1360	1190	1170
23	1170	801	---	---	1500	1500	1340	924	1110	1430	1200	1240
24	1140	1290	---	---	1540	1510	590	1000	680	1450	1210	1240
25	1020	1410	1470	---	1530	1490	575	1090	787	1500	1150	1250
26	913	1450	1480	---	1580	1520	577	1310	664	1410	1250	1190
27	990	1380	1460	---	1590	1510	574	1480	775	1370	1110	608
28	1140	1380	1480	---	---	1540	576	1050	957	1330	730	631
29	1210	1380	1530	1560	---	1550	780	1330	1040	1390	960	625
30	1270	1380	1520	---	---	1540	972	---	1180	1480	1080	450
31	1310	---	1530	1580	---	1550	---	1490	---	---	1130	---
MEAN	1060	1160	1480	1510	1520	1470	1220	987	980	1370	1080	1020
WTR YR 1986	MEAN	1230	MAX	1770	MIN	289						

## ARKANSAS RIVER BASIN

183

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.0	12.0	.0	9.0	16.0	14.0	---	---	24.0	27.0	---	22.0
2	21.0	13.0	.0	7.0	18.0	14.0	---	25.0	26.0	30.5	---	24.0
3	22.0	12.0	1.0	7.0	18.0	14.0	---	25.5	26.0	---	---	24.0
4	17.0	14.0	4.0	7.0	17.0	15.0	---	25.0	25.0	---	---	25.0
5	23.0	15.0	3.0	6.5	13.0	15.0	---	26.0	21.0	---	---	25.0
6	22.0	15.0	.0	9.0	9.5	16.0	---	28.0	27.0	---	---	26.0
7	23.0	14.0	.0	2.0	6.0	---	---	24.0	30.0	30.0	---	24.0
8	21.0	13.5	.0	1.5	7.0	15.5	---	25.5	31.0	30.0	---	24.0
9	22.0	18.5	11.0	5.0	---	20.0	---	---	29.0	31.0	---	28.0
10	16.0	12.0	8.0	6.0	3.0	---	14.0	---	28.0	31.0	---	25.5
11	---	12.0	5.5	9.0	4.0	13.0	15.5	---	28.0	28.0	29.0	25.5
12	21.0	15.0	6.0	8.0	4.5	22.0	18.0	28.0	---	31.0	29.0	25.5
13	21.0	19.0	4.0	8.0	6.5	13.0	18.0	28.0	---	30.0	30.0	28.0
14	19.0	16.0	6.0	9.0	7.0	15.5	15.5	20.0	---	29.0	---	24.0
15	19.0	11.0	6.5	9.0	5.0	---	13.0	24.5	27.0	27.0	---	29.0
16	19.0	11.0	6.5	9.0	13.0	16.5	13.0	26.0	25.0	30.0	---	25.0
17	19.0	14.0	6.5	10.5	11.5	17.0	20.5	22.0	25.5	30.0	---	31.0
18	20.0	16.0	---	10.0	15.5	17.0	22.0	20.0	26.5	31.5	32.0	27.0
19	19.0	10.0	---	11.5	15.5	15.5	18.0	21.5	28.0	33.0	31.0	29.0
20	20.0	10.0	---	13.0	11.0	13.0	20.0	21.5	28.0	32.0	32.0	29.0
21	20.0	10.0	---	8.0	11.0	15.0	20.0	23.0	29.0	30.5	34.0	28.0
22	21.0	12.0	---	6.5	12.0	16.0	20.0	24.0	30.0	30.5	29.0	29.0
23	22.0	10.0	---	---	14.0	19.0	23.0	24.0	27.0	29.5	29.0	29.0
24	21.0	10.0	---	---	14.0	19.0	25.5	24.0	28.0	31.5	29.0	29.0
25	21.0	12.0	1.5	---	18.0	19.0	23.0	24.0	30.0	31.5	30.0	28.0
26	21.0	11.0	6.0	---	18.0	19.0	25.0	24.0	29.0	30.5	29.0	25.0
27	21.0	1.5	6.0	---	12.0	20.0	23.0	23.0	29.0	33.0	---	25.5
28	21.0	2.0	8.0	---	---	23.0	23.0	23.0	30.5	31.0	26.0	25.0
29	18.0	1.0	9.0	11.0	---	24.0	25.0	24.0	30.0	31.0	---	24.0
30	13.0	.0	11.0	---	---	23.0	23.0	---	30.5	31.0	25.0	23.0
31	---	---	11.5	14.0	---	23.0	---	24.0	---	---	21.0	---
MEAN	20.0	11.5	5.0	8.0	11.5	17.5	20.0	24.0	27.5	30.5	29.0	26.0
WTR YR 1986		MEAN	19.0	MAX	34.0	MIN	.0					

## ARKANSAS RIVER BASIN

07242000 NORTH CANADIAN RIVER NEAR WETUMKA, OK

LOCATION.--Lat 35°15'54", long 96°12'25", in center of SW 1/4 sec.12, T.9 N., R.10 E., Hughes County, Hydrologic Unit 11100302, on left downstream side of bridge on U.S. Highway 75, 2.3 mi upstream from Wewoka Creek, 2.5 mi northeast of Wetumka, and at mile 84.4.

DRAINAGE AREA.--14,290 mi<sup>2</sup> of which 4,899 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 977: 1942. WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 683.28 ft, National Geodetic Vertical Datum of 1929. Prior to Jan. 19, 1939, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges: Records good. Some regulation by Lake Overholser (station 07240500) and other dams upstream.

AVERAGE DISCHARGE.--49 years, 683 ft<sup>3</sup>/s, 494,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 66,000 ft<sup>3</sup>/s, Apr. 15, 1945, gage height, 26.40 ft, no flow Aug. 27 to Oct. 11, 1954, Aug. 25 to Oct. 22, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1923 reached a stage of 26.9 ft, from information by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,600 ft<sup>3</sup>/s, May 17, gage height, 11.75 ft; minimum daily discharge, 158 ft<sup>3</sup>/s, Aug. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	319	660	1810	465	407	443	613	1330	1000	669	202	260
2	317	569	1170	482	402	443	1070	1160	944	631	192	278
3	654	527	899	491	406	439	2090	683	3740	590	183	232
4	703	493	849	501	409	446	7740	562	2310	541	182	222
5	425	461	903	502	396	454	3850	509	1810	505	196	232
6	333	437	827	497	472	447	2940	480	5200	482	221	326
7	288	415	718	478	551	443	2060	459	2690	459	209	322
8	261	394	632	462	530	438	1430	443	1750	443	196	272
9	243	374	610	462	484	454	1070	424	1290	414	224	284
10	230	352	1240	465	466	555	886	685	973	393	477	307
11	236	344	2680	465	448	690	777	980	1060	382	467	536
12	242	342	1590	465	508	2850	735	624	1130	378	355	513
13	1640	342	1040	456	550	3490	806	508	903	366	287	434
14	6330	365	739	451	569	1860	819	838	778	337	259	383
15	4930	1010	676	448	663	1540	720	8880	782	314	313	319
16	2090	817	720	452	701	1380	631	5550	808	301	271	319
17	1850	1100	698	458	661	1180	614	9310	746	289	237	458
18	6010	2480	758	458	627	1100	719	9530	969	283	204	864
19	9550	3330	719	456	620	1380	721	6300	1200	270	177	562
20	3320	3610	677	451	592	1030	1310	4570	1670	261	187	436
21	2890	2310	692	443	551	828	1070	4380	2220	252	205	298
22	1840	1540	628	416	518	849	804	3900	1250	269	176	372
23	1210	1060	623	394	477	831	721	2250	870	376	177	322
24	913	862	640	382	450	732	819	6460	690	320	179	256
25	756	751	617	391	433	680	660	3070	629	252	173	224
26	666	808	595	434	428	648	583	2200	699	250	184	202
27	608	854	592	411	431	628	616	1520	944	233	189	204
28	598	823	515	372	441	618	912	1560	1190	224	164	246
29	1360	795	477	378	---	617	963	1220	1100	219	161	229
30	1500	854	477	388	---	603	794	1170	911	205	158	2510
31	841	---	471	400	---	569	---	1150	---	199	181	---
TOTAL	53153	29079	26282	13774	14191	28665	39543	82705	42256	11107	6986	12422
MEAN	1715	969	848	444	507	925	1318	2668	1409	358	225	414
MAX	9550	3610	2680	502	701	3490	7740	9530	5200	669	477	2510
MIN	230	342	471	372	396	438	583	424	629	199	158	202
AC-FT	105400	57680	52130	27320	28150	56860	78430	164000	83810	22030	13860	24640
CAL YR 1985	TOTAL	591454		MEAN	1620	MAX	15000	MIN	151	AC-FT	1173000	
WTR YR 1986	TOTAL	360163		MEAN	987	MAX	9550	MIN	158	AC-FT	714400	

## ARKANSAS RIVER BASIN

185

07242000 NORTH CANADIAN RIVER NEAR WETUMKA, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1952, 1954 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1953 to current year.

WATER TEMPERATURE: October 1953 to current year.

REMARKS.--Samples were collected by a local observer on a daily basis. Samples were collected bimonthly, and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 37,100 microsiemens, Dec. 31, 1954; minimum daily, 98 microsiemens, Apr. 30, 1977.

WATER TEMPERATURE: Maximum daily, 39.0 °C, July 5, 1971; minimum daily, 0.0 °C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,590 microsiemens, July 17; minimum daily, 178 microsiemens, Oct. 19.

WATER TEMPERATURE: Maximum daily, 29.0 °C on several days during summer months; minimum daily, 0.0 °C, Dec. 14, 15, 26, Jan. 11, Feb. 11.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)
OCT											
16...	1500	1028	80020	4.66	1950	*297	6.40	22.0	20.0	550	750
DEC											
16...	1500	1028	80020	2.82	728	991	7.60	7.0	3.0	43	760
JAN											
27...	1230	1028	1028	2.26	403	1480	7.70	-4.0	3.0	--	--
FEB											
26...	1200	1028	80020	2.32	423	1360	7.70	21.0	14.0	38	740
APR											
02...	1330	1028	80020	3.63	1420	564	7.40	18.0	17.0	320	740
MAY											
20...	1400	1028	1028	7.10	4730	286	7.30	25.0	23.0	--	--
JUN											
25...	1100	1028	80020	2.70	604	904	7.70	28.0	30.0	130	750
AUG											
06...	1200	1028	80020	1.62	221	1150	8.00	25.0	28.0	32	750

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS./ PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
OCT											
16...	7.7	87	K3900	K2000	71	10	21	4.4	20	37	1
DEC											
16...	12.7	95	110	140	280	120	72	24	95	42	3
JAN											
27...	--	--	--	--	--	--	--	--	--	--	--
FEB											
26...	10.8	108	K6	K5	360	120	93	32	140	45	3
APR											
02...	8.5	91	K7000	>6800	140	36	37	11	51	44	2
MAY											
20...	--	--	--	--	--	--	--	--	--	--	--
JUN											
25...	7.4	100	K130	K860	250	57	69	19	80	40	2
AUG											
06...	11.7	153	K310	150	250	74	58	26	140	54	4

\* SPECIFIC CONDUCTANCE, LAB (US/CM)

07242000 NORTH CANADIAN RIVER NEAR WETUMKA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HC03)	CAR- BONATE IT-FLD (MG/L AS C03)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
OCT 16...	3.2	75	0	61	47	13	32	0.30	6.0	158	140
DEC 16...	5.4	195	0	160	7.8	87	160	0.50	14	578	560
JAN 27...	--	--	--	--	--	--	--	--	--	--	--
FEB 26...	6.5	302	0	248	9.6	150	200	0.70	12	808	780
APR 02...	3.6	124	0	102	7.8	42	76	0.40	5.4	297	290
MAY 20...	--	--	--	--	--	--	--	--	--	--	--
JUN 25...	7.1	236	0	194	7.5	91	120	0.40	11	524	510
AUG 06...	7.4	218	0	179	3.5	100	200	0.60	0.2	652	640
DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	
OCT 16...	0.21	832	0.570	--	0.010	0.03	0.580	0.610	0.020	0.03	
DEC 16...	0.79	1140	1.16	5.3	0.040	0.13	1.20	1.20	1.20	1.5	
JAN 27...	--	--	--	--	--	--	--	--	--	--	
FEB 26...	1.1	923	--	--	--	--	--	--	--	--	
APR 02...	0.40	1140	0.280	--	0.020	0.07	0.300	0.160	0.080	0.10	
MAY 20...	--	--	--	--	--	--	--	--	--	--	
JUN 25...	0.71	855	--	--	<0.010	--	0.750	0.090	0.030	0.04	
AUG 06...	0.89	389	--	--	<0.010	--	<0.100	0.080	0.030	0.04	
DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	
OCT 16...	1.7	2.3	0.870	2.7	0.260	0.240	0.74	--	--	--	
DEC 16...	0.90	2.1	1.10	3.4	0.900	0.880	2.7	20	3	220	
JAN 27...	--	--	--	--	--	--	--	--	--	--	
FEB 26...	--	--	--	--	--	--	--	--	--	--	
APR 02...	2.4	2.6	0.340	--	0.150	0.180	0.55	160	2	110	
MAY 20...	--	--	--	--	--	--	--	--	--	--	
JUN 25...	1.2	1.3	0.620	--	0.390	0.360	1.1	--	--	--	
AUG 06...	2.2	2.3	0.670	--	0.170	0.150	0.46	20	6	170	



## ARKANSAS RIVER BASIN

07242000 NORTH CANADIAN RIVER NEAR WETUMKA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
OCT 16...	--	--	--	--	--	--	--	--	--	--
DEC 16...	<5	<1	<1	<3	2	14	1	24	19	<0.1
JAN 27...	--	--	--	--	--	--	--	--	--	--
FEB 26...	--	--	--	--	--	--	--	--	--	--
APR 02...	<0.5	<1	1	<3	11	130	3	10	74	<0.1
MAY 20...	--	--	--	--	--	--	--	--	--	--
JUN 25...	--	--	--	--	--	--	--	--	--	--
AUG 06...	<0.5	3	2	<3	2	5	<5	34	2	0.1

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SED- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 16...	--	--	--	--	--	--	--	1380	7270	83
DEC 16...	<10	8	<1	<1	770	<6	4	255	501	34
JAN 27...	--	--	--	--	--	--	--	--	--	--
FEB 26...	--	--	--	--	--	--	--	181	207	48
APR 02...	<10	1	<1	<1	340	<6	7	4290	16400	28
MAY 20...	--	--	--	--	--	--	--	--	--	--
JUN 25...	--	--	--	--	--	--	--	362	590	79
AUG 06...	<10	4	<1	<1	780	11	3	99	59	68

## ARKANSAS RIVER BASIN

07242000 NORTH CANADIAN RIVER NEAR WETUMKA, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	872	817	645	1340	1410	1410	1220	753	952	760	1270	1430
2	996	944	1180	1330	1390	1430	1150	545	947	853	1270	1440
3	1030	1120	1190	1370	1370	1440	825	694	784	926	1380	1370
4	935	1070	1280	1380	1360	1440	280	762	384	1040	1360	1100
5	611	1170	1310	1380	1380	1450	324	887	547	1120	1170	1060
6	643	1220	1360	1410	1300	1460	---	983	377	1210	1130	1110
7	751	1260	1290	1420	1220	1440	623	1090	751	1260	1130	1220
8	873	1290	1280	1400	1180	1450	524	1130	649	1320	1140	1110
9	1010	1320	1270	1390	1320	1460	566	1150	590	1360	1070	814
10	1150	1370	910	1380	1200	1360	635	1060	800	1390	1000	1030
11	1220	1360	540	1390	1280	1430	736	556	824	1420	---	828
12	1300	1380	608	1360	1260	689	812	720	925	1440	1030	789
13	1320	1400	776	---	1350	505	868	906	833	1430	1000	1000
14	312	1360	850	1390	1300	457	1060	1130	911	1420	1130	1130
15	266	882	972	1400	1290	507	1220	261	1020	1470	1140	1160
16	292	603	1020	1380	1280	822	1240	270	1080	1500	1260	1250
17	459	1090	1080	1380	1360	620	1300	258	1180	1530	972	529
18	395	714	1070	1370	1360	778	1070	263	1020	1390	947	616
19	178	303	1220	1360	1350	764	1220	268	1050	1430	898	728
20	247	310	1310	1360	1380	780	780	350	688	1420	965	785
21	330	324	1320	1360	1380	903	808	353	739	1310	980	789
22	379	484	1390	1340	1370	1060	1160	540	722	1380	1010	954
23	423	608	1390	1370	1370	1180	1270	---	762	1310	1050	1120
24	473	616	1370	1340	1380	1040	1280	405	803	1260	1100	841
25	546	688	1400	1330	1350	1120	1310	372	879	1300	1090	820
26	669	813	1390	1340	1360	1220	1140	492	844	1410	1030	1050
27	791	940	1430	1400	1400	1270	1160	558	1050	1410	1120	996
28	938	929	1480	1390	1360	1290	824	736	1100	1320	1200	1100
29	872	1160	1470	1380	---	1310	822	721	751	1360	1190	968
30	472	1290	1340	1380	---	1320	936	911	671	1310	1180	988
31	767	---	1310	1410	---	1320	---	1090	---	1340	1130	---
MEAN	694	961	1180	1370	1330	1120	937	674	821	1300	1110	1000
WTR YR 1986		MEAN	1040	MAX	1530	MIN	178					

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.0	12.5	4.0	4.0	12.0	8.0	19.0	21.0	23.0	28.5	28.0	21.0
2	12.0	13.0	1.0	5.0	15.0	9.0	14.0	18.5	23.0	26.5	26.5	22.0
3	14.0	11.0	1.0	4.0	15.0	11.0	17.5	19.0	23.5	23.0	26.0	23.0
4	17.0	12.0	3.5	5.0	15.0	9.5	16.5	20.5	23.5	28.0	25.0	22.5
5	14.0	11.5	3.0	4.0	12.5	10.5	16.5	20.0	23.0	27.5	26.0	23.0
6	13.5	13.0	3.0	5.0	9.0	10.0	---	20.5	24.0	27.0	25.0	23.0
7	15.0	10.0	6.0	3.0	7.0	11.5	20.0	22.0	25.5	26.5	25.0	21.5
8	18.0	11.0	5.5	.5	4.0	11.0	21.5	22.0	23.0	28.0	26.5	19.0
9	20.0	11.5	7.0	1.0	1.5	15.0	17.0	22.0	26.5	28.0	25.0	22.0
10	16.5	10.0	8.0	1.0	1.0	14.0	17.0	22.0	27.0	28.0	25.0	23.5
11	17.0	10.5	5.0	.0	.0	14.5	18.0	22.0	25.0	27.0	---	23.0
12	27.5	13.5	2.0	4.5	.5	11.5	18.0	22.0	24.0	27.0	26.0	21.5
13	21.0	15.0	.5	---	2.0	11.0	19.0	23.5	26.5	27.0	26.0	21.0
14	20.0	15.0	.0	4.0	3.0	10.5	18.0	25.0	27.0	26.5	26.0	22.0
15	17.0	18.0	.0	5.0	3.0	12.0	16.5	19.0	26.5	27.0	27.0	22.0
16	16.0	9.0	1.0	8.0	8.0	11.5	14.0	20.0	26.5	27.0	24.5	24.0
17	18.0	11.5	2.0	11.0	9.0	13.0	16.5	20.0	29.0	27.0	26.5	23.0
18	18.0	15.0	3.0	11.5	10.0	15.0	16.0	19.0	26.5	27.0	27.5	24.0
19	19.0	17.0	1.0	8.5	11.0	13.0	16.5	17.5	26.0	26.0	27.0	25.0
20	18.0	16.5	1.0	7.5	12.0	10.5	14.0	18.0	26.0	28.0	27.0	25.0
21	18.0	10.5	3.0	10.0	4.0	9.0	15.0	19.5	28.0	27.0	28.0	25.0
22	18.5	23.0	4.0	7.0	4.5	10.0	15.0	21.0	28.0	28.0	25.0	25.0
23	20.0	12.0	4.5	5.0	7.5	12.0	16.0	---	28.0	26.5	27.5	25.0
24	20.0	10.0	6.0	4.0	9.0	14.0	18.0	22.0	26.0	27.5	27.5	25.0
25	20.0	9.5	.5	7.0	10.0	14.5	20.0	23.0	28.0	28.0	26.0	25.0
26	20.0	14.5	.0	5.0	12.5	15.0	21.0	21.0	27.0	29.0	25.5	25.0
27	18.0	10.0	2.0	2.5	14.0	15.0	21.0	21.0	28.0	29.0	25.5	23.0
28	17.0	7.0	1.5	4.0	9.0	16.0	17.0	20.5	29.0	28.0	21.5	25.0
29	15.5	6.0	3.0	4.0	---	17.0	20.0	22.0	28.5	28.0	20.0	29.0
30	13.5	6.5	4.5	4.5	---	18.5	21.0	23.5	29.0	28.0	21.0	24.5
31	13.0	---	5.0	8.0	---	19.0	---	23.0	---	28.0	21.0	---
MEAN	17.5	12.0	3.0	5.0	8.0	12.5	17.5	21.0	26.0	27.5	25.5	23.5
WTR YR 1986		MEAN	16.5	MAX	29.0	MIN	.0					

## ARKANSAS RIVER BASIN

189

## 07242350 DEEP FORK NEAR ARCADIA, OK

LOCATION.--Lat 35°38'58", long 97°21'12", on east line of NE 1/4 sec.36, T.14 N., R.2 W., Oklahoma County, Hydrologic Unit 11100303, on left bank at upstream side of county road bridge, 1.9 mi southwest of Arcadia, 2.0 mi upstream from Coffee Creek, and at mile 213.1.

DRAINAGE AREA.--105 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1969 to current year.

REVISED RECORDS.--WDR OK-77-1: 1975 (M) (gage height only), WDR OK-84-1: 1983 (m).

GAGE.--Water-stage recorder. Datum of gage is 941.65 ft, National Geodetic Vertical Datum of 1929. Prior to Nov. 1, 1974, at site 0.3 mi downstream at same datum. May 2, 1978, to May 14, 1979, the gage was temporarily moved 1.3 mi downstream to county road bridge, at a 5.00 ft lower datum.

REMARKS.--Estimated daily discharges: Oct. 17, Dec. 10, 12-15, 25, Jan. 8, 9, 27, Feb. 12-14, Mar. 25-30, July 5-15, and July 17 to Sept. 17. Records poor. Dam construction 0.5 mi upstream effects flow at times.

AVERAGE DISCHARGE.--17 years, 66.3 ft<sup>3</sup>/s, 48,030 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,300 ft<sup>3</sup>/s, Nov. 2, 1974, gage height, 26.9 ft from floodmark; minimum daily, 2.2 ft<sup>3</sup>/s, Sept. 25, 26, 1984 (revised).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,330 ft<sup>3</sup>/s, May 17, gage height, 7.54 ft; minimum daily discharge, 6.4 ft<sup>3</sup>/s, Aug. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	22	27	19	15	13	15	19	17	12	10	19
2	13	21	23	18	15	13	35	18	78	13	9.6	12
3	12	21	20	18	17	13	193	16	94	10	9.4	10
4	10	21	21	18	16	13	490	16	50	9.5	9.2	9.7
5	9.1	20	20	18	14	13	34	16	101	9.3	11	17
6	8.8	18	20	18	14	13	26	16	23	9.2	9.5	11
7	8.4	18	19	17	14	13	24	15	31	9.0	8.5	10
8	8.5	18	18	16	25	13	22	19	28	8.9	9.0	9.5
9	8.5	18	17	16	20	13	21	209	14	8.7	17	9.0
10	54	17	16	17	20	15	20	157	13	8.5	11	8.5
11	55	17	19	19	27	23	19	436	13	8.4	10	13
12	19	17	21	19	24	52	20	154	11	8.2	9.4	10
13	18	34	22	16	21	24	19	23	11	8.1	8.7	8.4
14	327	137	21	15	19	19	18	206	12	7.9	8.2	7.5
15	346	369	19	16	17	17	17	1080	173	7.8	8.6	9.5
16	69	340	18	15	16	19	18	671	25	7.6	8.3	11
17	33	142	17	15	15	17	18	1180	17	7.6	8.0	9.6
18	295	43	16	15	15	68	18	1180	15	7.4	7.6	16
19	446	46	16	15	14	38	30	960	15	7.3	8.0	13
20	307	26	16	14	15	23	62	600	13	7.2	7.7	12
21	86	24	16	14	14	20	25	305	15	7.2	7.4	11
22	27	23	16	15	14	19	21	113	13	7.1	7.2	11
23	25	23	16	14	14	18	19	41	14	7.0	7.0	11
24	24	22	16	14	14	17	18	19	38	7.0	6.8	11
25	24	21	18	14	14	18	18	17	13	6.9	6.6	11
26	31	22	19	14	14	17	17	17	12	6.8	7.2	14
27	24	20	16	14	14	17	42	23	12	9.2	8.6	72
28	23	20	18	15	13	16	51	23	12	8.8	7.2	20
29	23	19	19	15	---	16	22	16	12	8.4	6.7	562
30	26	20	19	14	---	16	19	15	11	8.3	6.4	1080
31	24	---	19	15	---	15	---	15	---	8.1	6.8	---
TOTAL	2408.3	1579	578	492	464	621	1371	7595	906	260.4	266.6	2028.7
MEAN	77.7	52.6	18.6	15.9	16.6	20.0	45.7	245	30.2	8.40	8.60	67.6
MAX	446	369	27	19	27	68	490	1180	173	13	17	1080
MIN	8.4	17	16	14	13	13	15	15	11	6.8	6.4	7.5
AC-FT	4780	3130	1150	976	920	1230	2720	15060	1800	517	529	4020

CAL YR 1985 TOTAL 25775.4 MEAN 70.6 MAX 3320 MIN 5.4 AC-FT 51130  
WTR YR 1986 TOTAL 18569.9 MEAN 50.9 MAX 1180 MIN 6.4 AC-FT 36830

## ARKANSAS RIVER BASIN

07242350 DEEP FORK NEAR ARCADIA, OK--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1969 to January 1980.

WATER TEMPERATURE: October 1969 to January 1980.

REMARKS.--A sample was collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT											
31...	1530	1028	80020	23	870	8.10	19.0	16.0	730	11.6	123
NOV											
25...	1400	1028	80020	21	1010	8.20	15.5	8.5	730	11.6	104
DEC											
09...	1430	1028	80020	17	1060	8.20	20.0	9.0	740	10.9	97
JAN											
23...	1600	1028	80020	15	1020	8.40	12.5	10.0	740	10.5	96
FEB											
26...	1530	1028	80020	14	973	8.60	30.0	21.0	730	7.1	84
MAR											
31...	1130	1028	80020	15	1010	8.20	25.0	21.0	740	8.4	97
MAY											
02...	1200	1028	80020	17	756	8.00	26.0	20.5	740	8.3	95
JUN											
13...	1430	1028	80020	11	847	8.20	32.0	32.0	740	8.4	119
JUL											
16...	1130	1028	80020	7.6	810	8.20	28.0	28.5	740	7.8	104
SEP											
18...	1200	1028	80020	16	364	7.50	28.0	27.0	740	6.8	88
DATE		OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MERCURY DIS- SOLVED (UG/L AS HG)
OCT											
31...	27	38	79	0.650	0.060	0.08	0.200	40	<100	<0.1	
NOV											
25...	19	46	73	1.10	0.090	0.12	0.100	30	<100	<0.1	
DEC											
09...	25	48	96	1.50	0.160	0.21	0.070	30	<100	<0.1	
JAN											
23...	38	58	84	<0.490	0.030	0.04	0.090	10	<100	--	
FEB											
26...	27	48	110	<0.100	0.060	0.08	0.060	70	<100	<0.1	
MAR											
31...	14	50	88	<0.100	0.070	0.09	0.050	30	<100	<0.1	
MAY											
02...	41	34	58	0.530	0.030	0.04	0.130	40	<100	<0.1	
JUN											
13...	19	49	61	<0.100	0.060	0.08	0.050	10	<100	<0.1	
JUL											
16...	34	51	78	<0.100	0.030	0.04	0.050	60	<100	0.1	
SEP											
18...	41	13	26	0.380	0.030	0.04	0.090	<10	<100	<0.1	

ARKANSAS RIVER BASIN

191

07242380 DEEP FORK NEAR WARWICK, OK

LOCATION.--Lat 35°40'05", long 90°00'33", NE 1/4 NW 1/4 sec. 20, T.14 N., R.3 E., Lincoln County, Hydrologic Unit 11100303, on left downstream abutment on U.S. Highway 66, 0.5 mi southwest of Warwick, and at mile 189.3.

DRAINAGE AREA.--532 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1, 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is 823.053 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 15-18, Dec. 5-23, Feb. 10-17, Apr. 10-22, May 25-27, May 29 to June 1, 6-19, June 21 to July 21, July 23 to Aug. 4, 7, 10-18, and Sept. 28, 29. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,700 ft<sup>3</sup>/s Oct. 21, 1983, gage height, 22.05 ft, from high-water mark; minimum daily discharge, 3.5 ft<sup>3</sup>/s Oct. 9, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 10,800 ft<sup>3</sup>/s, May 15, gage height, 18.64 ft; minimum daily discharge, 12 ft<sup>3</sup>/s, Sept. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	147	94	166	97	97	63	67	83	68	60	45	28
2	73	91	120	98	97	66	83	75	130	59	45	156
3	54	88	148	95	97	63	1550	67	214	58	46	62
4	44	85	136	94	106	60	1540	62	111	57	46	57
5	37	84	140	91	100	58	556	61	80	56	63	74
6	32	79	140	94	99	60	216	61	250	55	147	141
7	28	71	145	93	96	54	172	58	100	54	50	95
8	27	67	140	88	124	57	161	74	150	53	136	57
9	23	69	130	94	149	64	133	640	130	53	348	45
10	87	64	130	109	137	60	110	441	110	52	250	37
11	212	62	125	107	167	233	95	909	100	52	180	98
12	75	76	125	117	140	443	85	514	95	52	110	76
13	89	376	140	107	125	177	78	227	92	51	80	37
14	5810	1080	130	104	110	129	74	2990	90	50	65	28
15	1130	550	125	98	98	110	68	6250	300	50	55	44
16	674	370	120	105	92	112	67	1600	150	49	45	49
17	252	250	115	104	87	106	66	8010	110	48	40	44
18	3150	200	110	99	83	225	66	2120	95	48	35	105
19	1180	440	105	98	83	275	85	1380	175	47	32	40
20	793	261	105	99	76	112	250	1110	108	47	31	26
21	566	212	105	96	71	96	150	754	95	46	34	20
22	323	191	103	91	69	92	110	437	87	46	28	17
23	183	182	100	90	69	84	94	254	80	46	25	15
24	147	163	100	91	69	77	82	159	90	45	32	14
25	122	154	91	89	70	73	76	125	78	45	22	12
26	168	155	93	87	73	72	74	105	70	45	19	23
27	122	132	99	88	65	69	103	90	67	45	35	260
28	104	121	95	90	64	68	260	82	65	45	76	75
29	103	118	100	89	---	69	110	75	63	45	30	1000
30	106	132	101	89	---	63	87	72	61	45	27	3000
31	103	---	100	93	---	62	---	70	---	45	23	---
TOTAL	15964	6017	3682	2984	2713	3352	6668	28955	3414	1549	2200	5735
MEAN	515	201	119	96.3	96.9	108	222	934	114	50.0	71.0	191
MAX	5810	1080	166	117	167	443	1550	8010	300	60	348	3000
MIN	23	62	91	87	64	54	66	58	61	45	19	12
AC-FT	31660	11930	7300	5920	5380	6650	13230	57430	6770	3070	4360	11380

CAL YR 1985 TOTAL 162872 MEAN 446 MAX 11500 MIN 18 AC-FT 323100  
WTR YR 1986 TOTAL 83233 MEAN 228 MAX 8010 MIN 12 AC-FT 165100

## ARKANSAS RIVER BASIN

07243000 DRY CREEK NEAR KENDRICK, OK

LOCATION.--Lat 35°46'55", long 96°51'20", in NW 1/4 NW 1/4 sec.14, T.15 N., R.4 E., Lincoln County, Hydrologic Unit 11100303, near left bank on downstream side of county road bridge, 1.0 mi downstream from Beaver Creek and 4.5 mi west of Kendrick.

DRAINAGE AREA.--69.0 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1955 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 820 ft, from topographic map. Prior to Oct. 1, 1981, gage at same site and datum 5.00 ft higher.

REMARKS.--Estimated daily discharges: Feb. 18. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--31 years, 22.8 ft<sup>3</sup>/s, 16,520 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,000 ft<sup>3</sup>/s, Nov. 2, 1974, gage height, 24.20 ft present datum; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft<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)
Apr. 3	1945	2,630	15.84	May 17	0615	*6,510	*20.77
May 14	2015	3,520	18.07	Sept. 29	2045	3,520	18.15

No flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	4.8	22	8.2	7.7	6.9	31	6.4	6.1	7.3	2.6	1.0
2	1.9	4.6	24	8.5	7.9	7.1	16	5.8	8.3	7.6	2.7	1.3
3	1.7	4.5	15	8.2	7.4	7.0	476	5.6	6.4	6.5	2.7	1.2
4	1.6	4.5	12	8.0	7.4	6.8	161	5.5	6.1	6.2	2.7	1.2
5	1.4	4.6	11	7.8	7.9	7.0	72	5.5	5.8	5.9	6.0	3.7
6	1.6	4.5	11	8.3	8.8	6.8	67	5.5	6.2	5.7	6.0	2.0
7	1.5	4.3	11	7.9	8.5	6.8	24	5.2	5.2	5.7	4.5	.65
8	1.4	4.5	10	12	8.0	6.8	17	5.4	4.5	5.6	15	.44
9	1.6	4.7	11	11	15	7.2	14	5.8	6.7	5.4	120	.43
10	3.5	4.4	11	9.6	14	6.9	13	13	5.2	5.2	51	.29
11	3.2	4.7	13	9.8	12	41	12	19	7.3	5.2	2.4	.24
12	2.7	6.3	10	8.3	9.8	94	12	6.5	4.6	5.5	1.5	.04
13	3.3	81	16	8.5	9.1	18	11	5.2	4.1	5.2	1.2	.00
14	515	507	13	8.2	9.4	12	11	706	36	5.3	.99	.03
15	17	403	11	8.4	9.0	11	9.3	330	33	5.0	3.0	.22
16	7.2	53	9.2	8.2	7.9	12	9.0	40	37	5.0	3.8	.37
17	5.7	28	8.4	8.1	7.7	11	17	2480	13	4.8	1.5	.79
18	408	194	7.7	7.8	7.7	16	14	103	8.4	4.7	1.1	.25
19	30	136	7.5	8.1	7.6	11	11	35	7.5	4.6	.87	.00
20	11	34	7.3	7.8	7.3	8.6	12	21	6.8	4.6	.80	.00
21	8.0	23	8.0	7.2	6.9	7.9	9.2	15	6.6	4.6	.64	.00
22	6.9	20	9.9	7.4	7.0	8.2	8.3	13	6.5	4.9	.57	.00
23	5.7	17	9.4	7.6	7.2	8.2	8.2	11	6.6	5.1	.54	.00
24	5.6	16	9.0	7.2	7.1	7.7	7.8	9.6	6.7	4.9	.54	.00
25	5.2	15	8.9	7.6	7.1	7.5	7.4	23	6.7	4.3	.41	.00
26	5.1	16	11	8.1	7.3	7.4	7.1	11	6.7	4.1	.25	.30
27	4.6	13	9.4	8.0	7.1	7.1	9.4	9.4	6.6	3.8	1.4	2.1
28	4.8	13	9.2	7.2	7.1	7.2	8.0	8.1	6.5	3.4	.60	.14
29	5.9	12	8.8	7.3	---	7.0	6.8	7.3	6.4	3.2	.34	.959
30	5.6	15	9.1	7.6	---	6.9	6.6	6.9	6.2	3.0	.29	189
31	5.0	---	8.6	7.5	---	6.8	---	6.5	---	2.7	.39	---
TOTAL	1083.8	1652.4	342.4	255.4	236.9	385.8	1088.1	3930.2	283.7	155.0	236.33	1164.69
MEAN	35.0	55.1	11.0	8.24	8.46	12.4	36.3	127	9.46	5.00	7.62	38.8
MAX	515	507	24	12	15	94	476	2480	37	7.6	120	959
MIN	1.4	4.3	7.3	7.2	6.9	6.8	6.6	5.2	4.1	2.7	.25	.00
AC-FT	2150	3280	679	507	470	765	2160	7800	563	307	469	2310

CAL YR 1985 TOTAL 24498.45 MEAN 67.1 MAX 3280 MIN .12 AC-FT 48590  
WTR YR 1986 TOTAL 10814.61 MEAN 29.6 MAX 2480 MIN .00 AC-FT 21450



## ARKANSAS RIVER BASIN

193

07243500 DEEP FORK NEAR BEGGS, OK

LOCATION.--Lat 35°40'31", long 96°03'55", NW 1/4 SW 1/4 sec.20, T.14 N., R.12 E., Okmulgee County, Hydrologic Unit 11100303, on right bank 1,000 ft downstream from county road bridge, 2.8 mi upstream from Adams Creek, 4.0 mi south of Beggs, 8.2 mi downstream from Flat Rock (Checkerboard) Creek, and at mile 84.8.

DRAINAGE AREA.--2,018 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1938 to current year.

REVISED RECORDS.--WSP 957: 1941. WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 632.552 ft, National Geodetic Vertical Datum of 1929. Prior to Aug. 29, 1939, nonrecording gage at site 550 ft upstream at same datum. Aug. 29, 1939 to June 22, 1953, nonrecording gage at site 1,000 ft upstream and same datum. June 23, 1953 to July 15, 1981, recording gage at site 1,000 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 1-5, Dec. 13 to Jan. 6, and Feb. 19. Records fair.

AVERAGE DISCHARGE.--48 years, 842 ft<sup>3</sup>/s, 610,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 66,800 ft<sup>3</sup>/s May 11, 1943, gage height, 34.55 ft; no flow at times in 1939, 1954, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft<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. 15	1700	12,400	23.94	Apr. 6	1700	4,970	18.30
Oct. 20	0400	*15,800	*25.50	May 19	1400	13,800	24.64
Nov. 21	1600	7,750	21.12	June 6	0800	3,100	13.68
Mar. 18	0500	4,420	17.10				

Minimum daily discharge 20 ft<sup>3</sup>/s, Aug. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	301	1040	2040	310	199	232	323	741	935	204	24	28
2	258	735	2090	307	204	219	664	1390	784	177	22	40
3	364	640	1260	305	213	213	1860	813	763	163	21	52
4	472	530	911	300	234	206	3980	491	894	154	20	46
5	370	470	791	300	244	197	4310	372	1370	138	21	44
6	259	428	724	298	328	193	4860	312	2920	127	23	140
7	191	374	667	297	716	191	4840	275	2520	116	23	141
8	149	328	624	287	637	186	4610	247	2160	103	24	96
9	121	295	582	264	592	182	4530	227	1720	92	27	70
10	103	278	584	243	590	184	4480	413	1180	85	116	84
11	88	258	2100	244	518	219	3850	718	1300	78	543	105
12	82	250	2860	260	451	2030	2030	617	1110	69	771	124
13	920	249	1870	259	419	3380	1260	831	895	64	705	95
14	5860	482	1120	263	425	3600	998	1520	681	58	440	66
15	11600	2540	885	269	607	3670	1090	4400	540	53	274	56
16	11200	3010	760	273	606	3920	814	4430	471	52	180	61
17	9050	2680	665	272	574	4290	646	7690	821	49	127	73
18	10300	3020	585	271	519	4360	569	11700	1240	48	85	318
19	14200	4280	525	269	465	3600	569	13800	1270	45	64	299
20	15300	5720	490	270	424	1920	1140	13600	850	40	82	126
21	13000	7600	465	268	387	1080	1560	13400	558	36	103	88
22	10400	7680	442	263	340	859	1010	13300	429	33	76	71
23	8570	7430	425	249	308	754	691	12200	351	33	55	67
24	7480	6780	402	241	292	633	609	10300	346	32	44	59
25	6470	5870	383	234	276	542	534	8660	320	33	37	45
26	5470	4960	365	226	264	482	448	7300	255	35	34	39
27	4520	3620	350	210	257	439	396	5940	408	34	33	643
28	2560	1660	337	206	249	399	513	4910	346	29	32	1210
29	1710	1060	328	205	---	370	610	4020	274	26	33	946
30	2540	894	322	203	---	351	512	2380	242	26	37	3220
31	2070	---	317	199	---	330	---	1270	---	26	32	---
TOTAL	145978	75161	26269	8065	11338	39231	54306	148267	27953	2258	4108	8452
MEAN	4709	2505	847	260	405	1266	1810	4783	932	72.8	133	282
MAX	15300	7680	2860	310	716	4360	4860	13800	2920	204	771	3220
MIN	82	249	317	199	199	182	323	227	242	26	20	28
AC-FT	289500	149100	52100	16000	22490	77810	107700	294100	55440	4480	8150	16760
CAL YR 1985	TOTAL 1008080	MEAN 2762	MAX 26700	MIN 26	AC-FT 2000000							
WTR YR 1986	TOTAL 551386	MEAN 1511	MAX 15300	MIN 20	AC-FT 1094000							

## ARKANSAS RIVER BASIN

07243500 DEEP FORK NEAR BEGGS, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1952 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1951 to current year.

WATER TEMPERATURE: November 1951 to current year.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 10,500 microsiemens, Jan. 12, 1955; minimum daily, 74 microsiemens, Oct. 21, 1983.

WATER TEMPERATURE (1951-85): Maximum daily, 38.5 °C, Aug. 8, 1970; minimum daily, 0.0 °C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,330 microsiemens, July 31; minimum daily, 142 microsiemens, May 19.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)
NOV 06...	1625	1028	80020	4.06	440	*667	--	12.0	14.0	39	742
FEB 24...	1550	1028	80020	3.45	291	1070	8.40	16.5	11.0	10	749
MAY 07...	1515	1028	80020	3.39	270	*766	8.00	24.0	23.5	56	740
AUG 06...	1215	1028	80020	1.07	23	1360	8.20	30.0	28.0	35	743
DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS./ PER 100 ML)	HARD- NESS WH WAT (MG/L AS CACO3)	HARD- NESS NONCARB TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
NOV 06...	7.2	72	--	--	220	51	48	25	52	33	2
FEB 24...	10.6	98	K17	K35	300	54	59	36	97	41	3
MAY 07...	7.0	85	110	180	230	41	48	27	63	37	2
AUG 06...	5.5	73	120	59	370	71	65	50	150	47	3
DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITU- ENTS, DIS- SOLVED (MG/L)
NOV 06...	3.2	--	--	--	--	25	93	0.20	11	350	360
FEB 24...	2.4	256	20	242	1.6	37	190	0.30	3.5	567	590
MAY 07...	3.1	--	--	--	3.7	30	120	0.30	8.6	426	410
AUG 06...	3.5	364	0	298	3.6	46	240	0.40	5.5	748	740

\* SPECIFIC CONDUCTANCE, LAB (US/CM)

## ARKANSAS RIVER BASIN

07243500 DEEP FORK NEAR BEGGS, OK--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)
NOV 06...	0.48	416	0.220	0.97	0.010	0.03	0.230	0.090	0.030	0.04
FEB 24...	0.77	445	--	--	<0.010	--	<0.100	0.030	0.020	0.03
MAY 07...	0.58	311	0.370	--	0.020	0.07	0.390	0.050	0.060	0.08
AUG 06...	1.0	46	--	--	<0.010	--	<0.100	0.020	0.020	0.03
DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
NOV 06...	0.81	0.90	0.120	0.37	0.030	0.030	0.09	20	1	160
FEB 24...	0.57	0.60	0.050	--	0.010	0.010	0.03	20	<1	170
MAY 07...	0.95	1.0	0.110	--	0.030	0.020	0.06	--	--	--
AUG 06...	0.68	0.70	0.080	--	0.030	<0.010	--	<10	<1	240
DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
NOV 06...	<0.5	<1	<1	<3	5	37	2	6	160	0.2
FEB 24...	<0.5	<1	1	<3	3	8	2	9	230	0.1
MAY 07...	--	--	--	--	--	--	--	--	--	--
AUG 06...	<0.5	5	<1	<3	2	6	<5	11	27	0.2
DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 06...	<10	4	<1	<1	430	<6	12	146	173	95
FEB 24...	<10	<1	<1	<1	610	<6	12	35	27	81
MAY 07...	--	--	--	--	--	--	--	--	--	--
AUG 06...	<10	1	<1	<1	740	<6	5	24	1.5	75

## ARKANSAS RIVER BASIN

07243500 DEEP FORK NEAR BEGGS, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	780	261	263	892	940	993	761	741	575	587	1180	876
2	165	392	267	896	931	1090	764	746	580	682	1200	885
3	523	391	265	923	936	1100	327	682	602	777	1210	903
4	517	392	266	928	940	1090	228	636	657	811	1250	840
5	165	393	797	930	939	1110	227	640	695	866	1300	804
6	166	394	788	988	952	1100	228	680	477	872	1260	744
7	387	394	790	968	770	1060	313	668	393	886	1230	778
8	518	392	783	977	781	1050	314	823	377	962	1220	803
9	519	770	795	963	790	1070	313	829	385	1020	1220	843
10	168	775	804	972	782	1090	331	747	391	1080	1200	865
11	469	776	802	1010	783	1120	320	746	426	1070	1200	880
12	518	773	476	1020	882	1120	549	858	439	1070	1200	904
13	522	773	456	1020	884	316	552	864	463	1070	1200	796
14	167	764	457	1050	873	339	552	---	498	1080	1180	712
15	505	765	454	1060	794	310	608	178	628	1090	362	694
16	166	764	446	1030	792	309	612	174	501	1100	372	653
17	517	761	443	1020	793	310	709	147	556	1120	392	531
18	264	---	444	1010	841	389	715	148	570	1140	434	524
19	255	209	453	1040	842	390	686	142	542	1140	462	520
20	245	210	443	1050	833	388	684	145	485	1140	497	500
21	255	202	769	1060	855	386	645	184	555	1160	517	458
22	257	207	772	1080	874	393	678	186	556	1180	528	423
23	259	213	771	1090	917	672	644	221	550	1200	570	445
24	249	207	774	1100	927	693	645	213	611	1250	625	522
25	263	218	772	1050	1050	692	856	307	672	1220	654	606
26	263	219	777	1050	1060	756	851	309	734	1260	671	610
27	262	263	945	1050	1070	760	858	310	765	1260	683	520
28	250	262	948	1050	1080	943	849	352	816	1270	721	234
29	260	264	947	1060	---	949	846	352	720	1310	775	231
30	262	248	946	1080	---	1010	745	356	666	1320	812	143
31	253	---	948	1070	---	1020	---	505	---	1330	833	---
MEAN	334	436	647	1020	890	775	580	463	563	1070	870	642
WTR YR 1986		MEAN	692	MAX	1330	MIN	142					

## ARKANSAS RIVER BASIN

197

## 07244800 EUFAULA LAKE NEAR BROOKEN, OK

LOCATION.--Lat 35°18'25", long 95°21'45", in SW 1/4 sec.25, T.10 N., R.18 E., McIntosh County, Hydrologic Unit 11090204, in intake structure near left end of dam on Canadian River, 4.0 mi northeast of Brooken, and at mile 27.0.

DRAINAGE AREA.--47,522 mi<sup>2</sup>, of which 9,700 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--February 1964 to current year. Prior to October 1970, published as Eufaula Reservoir near Brooken.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earthen dam having a gated, concrete, ogee-type spillway weir controlled by eleven 40-foot tainter gates. Closure for diversion was made Feb. 1, 1963, and regulated storage began Feb. 10, 1964; minimum power pool was first filled June 17, 1964. Capacity, 3,825,400 acre-ft at elevation 597.0 ft, top of flood-control pool; 2,314,600 acre-ft at elevation 585.0 ft, top of power pool, and 851,600 acre-ft at elevation 565.0 ft, bottom of power pool. Dead storage is negligible. Figures given herein represent total contents. Reservoir is used for flood control, sediment control, power development, and other water uses. Revised capacity table, based on survey 1977, used since Oct. 1, 1983.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 3,791,000 acre-ft, Apr. 25, 1973, elevation, 596.95 ft; minimum since power pool first filled, 1,182,000 acre-ft, Nov. 4, 1964, elevation, 570.23 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 2,854,000 acre-ft, Dec. 2, elevation, 589.75 ft; minimum, 2,012,000 acre-ft, Mar. 11, elevation, 581.97 ft.

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

581	1,923,000	587	2,533,000
583	2,111,000	589	2,764,000
585	2,315,000	591	3,006,000

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2170000	2555000	2853000	2403000	2176000	2094000	2166000	2344000	2506000	2382000	2236000	2167000
2	2170000	2536000	2845000	2398000	2176000	2092000	2176000	2348000	2481000	2366000	2233000	2167000
3	2172000	2515000	2809000	2394000	2172000	2082000	2198000	2349000	2536000	2350000	2229000	2166000
4	2172000	2496000	2769000	2392000	2164000	2071000	2286000	2345000	2559000	2349000	2222000	2166000
5	2171000	2473000	2721000	2388000	2156000	2059000	2385000	2338000	2617000	2349000	2224000	2171000
6	2170000	2454000	2681000	2377000	2183000	2048000	2444000	2321000	2666000	2350000	2224000	2176000
7	2170000	2438000	2648000	2361000	2205000	2029000	2462000	2324000	2677000	2340000	2226000	2175000
8	2171000	2427000	2610000	2349000	2216000	2029000	2460000	2336000	2654000	2331000	2227000	2168000
9	2170000	2409000	2601000	2330000	2222000	2029000	2462000	2343000	2623000	2323000	2256000	2163000
10	2174000	2406000	2635000	2316000	2223000	2022000	2462000	2340000	2582000	2318000	2253000	2159000
11	2174000	2378000	2688000	2315000	2220000	2020000	2464000	2337000	2542000	2311000	2257000	2167000
12	2178000	2322000	2706000	2302000	2210000	2041000	2469000	2334000	2514000	2316000	2257000	2163000
13	2180000	2372000	2694000	2289000	2208000	2079000	2468000	2334000	2498000	2312000	2257000	2165000
14	2217000	2382000	2668000	2283000	2198000	2105000	2468000	2349000	2488000	2314000	2255000	2167000
15	2248000	2390000	2639000	2275000	2204000	2128000	2456000	2372000	2476000	2310000	2263000	2162000
16	2268000	2412000	2608000	2270000	2196000	2146000	2448000	2461000	2471000	2309000	2264000	2178000
17	2288000	2434000	2574000	2264000	2186000	2159000	2435000	2538000	2472000	2305000	2265000	2189000
18	2325000	2470000	2546000	2268000	2181000	2186000	2441000	2634000	2473000	2304000	2258000	2189000
19	2377000	2543000	2524000	2268000	2178000	2194000	2471000	2677000	2477000	2302000	2248000	2194000
20	2535000	2610000	2507000	2267000	2159000	2199000	2513000	2664000	2475000	2301000	2242000	2198000
21	2548000	2696000	2505000	2263000	2157000	2200000	2533000	2640000	2476000	2302000	2236000	2200000
22	2561000	2700000	2497000	2258000	2156000	2207000	2523000	2622000	2478000	2300000	2226000	2198000
23	2569000	2716000	2490000	2248000	2153000	2207000	2492000	2610000	2473000	2300000	2223000	2197000
24	2574000	2736000	2475000	2249000	2139000	2201000	2459000	2688000	2456000	2297000	2221000	2194000
25	2571000	2751000	2462000	2249000	2130000	2206000	2430000	2710000	2444000	2289000	2210000	2194000
26	2568000	2768000	2453000	2240000	2121000	2188000	2402000	2704000	2431000	2287000	2200000	2193000
27	2560000	2793000	2435000	2229000	2109000	2181000	2384000	2682000	2418000	2285000	2198000	2193000
28	2553000	2806000	2427000	2210000	2101000	2173000	2364000	2642000	2414000	2280000	2196000	2198000
29	2566000	2796000	2418000	2197000	---	2172000	2355000	2607000	2408000	2267000	2178000	2193000
30	2579000	2824000	2410000	2188000	---	2173000	2343000	2572000	2394000	2256000	2171000	2258000
31	2575000	---	2407000	2179000	---	2167000	---	2542000	---	2244000	2167000	---
MAX	2579000	2824000	2853000	2403000	2223000	2207000	2533000	2710000	2677000	2382000	2265000	2258000
MIN	2170000	2322000	2407000	2179000	2101000	2020000	2166000	2321000	2394000	2244000	2167000	2159000
(+)	587.37	589.34	585.86	583.69	582.90	583.57	585.26	587.08	585.74	584.33	583.57	584.46
(++)	+405,200	+249,000	-417,000	-228,000	-78,000	+66,000	+176,000	+199,000	-148,000	-150,000	-77,000	+91,000
CAL YR 1985	MAX	3255200	MIN	2159800	(++)	-354,800						
WTR YR 1986	MAX	2853000	MIN	2020000	(++)	+88,200						

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

## ARKANSAS RIVER BASIN

## 07245000 CANADIAN RIVER NEAR WHITEFIELD, OK

LOCATION.--Lat 35°15'50", long 95°14'21", in SE 1/4 SE 1/4 sec.12, T.9 N., R.19 E., Haskell County, Hydrologic Unit 11090204, on left downstream bank at end of bridge on State Highway 2, 0.8 mi north of Whitefield, 5.5 mi upstream from Taloka (Snake) Creek, 8.2 mi downstream from Eufaula Dam, and at mile 18.8.

DRAINAGE AREA.--47,576 mi<sup>2</sup>, of which 9,700 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1938 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1177: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 473.16 ft, National Geodetic Vertical Datum of 1929. Prior to Jan. 11, 1939, nonrecording gage and Jan. 11, 1939 to Dec. 10, 1941, June 12, 1947 to Sept. 30, 1948, water-stage recorder, all at site 2.1 mi downstream at datum 2.20 ft higher. Dec. 11, 1941 to June 1, 1947, and Oct. 1, 1948 to Sept. 30, 1978, water-stage recorder at site 400 ft upstream and at datum 5.00 ft higher. Oct. 1, 1978 to July 26, 1983, water-stage recorder at site 400 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Prior to February 1964, occasional slight regulation by Conchas Lake in New Mexico and, except for 54 mi<sup>2</sup> of intervening area, completely regulated thereafter by Eufaula Lake (station 07244800).

AVERAGE DISCHARGE.--Prior to regulation by Eufaula Dam, 25 years (water years 1939-63), 6,005 ft<sup>3</sup>/s, 4,347,000 acre-ft/yr; since regulation by Eufaula Dam, 19 years (water years 1968-86), 5,485 ft<sup>3</sup>/s, 3,974,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 281,000 ft<sup>3</sup>/s, May 10, 1943, gage height, 25.5 ft, datum then in use; minimum daily discharge, 0.4 ft<sup>3</sup>/s, Oct. 8, 1956.

EXTREMES FOR OUTSIDE PERIOD OF RECORD.--Maximum stage known since 1898, that of May 10, 1943, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 34,000 ft<sup>3</sup>/s, May 28, June 10, gage height, 14.26 ft; minimum daily discharge, 36 ft<sup>3</sup>/s, Oct. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	16000	16600	5140	4710	5710	6320	12400	27800	10600	4830	1050
2	52	15900	18100	4710	2900	3520	5620	10500	24400	10600	1150	4550
3	48	15900	25700	4570	6870	6010	6140	5980	18400	10500	121	4090
4	46	13700	30700	4900	9490	6230	8220	5470	10400	2170	2420	3790
5	44	13600	29800	4820	8340	7280	10400	9660	10300	148	1110	2080
6	41	15100	26000	6540	6420	7450	8260	10400	10000	108	254	868
7	36	9100	22600	11000	4210	9060	13300	11000	21800	5290	494	95
8	37	9810	22500	10800	4410	4840	10900	7950	29300	4560	357	2420
9	38	10000	20300	10500	3940	2660	10800	7250	29800	4010	116	3210
10	39	9020	17200	10200	7130	5150	10900	4540	33700	2970	160	3360
11	41	10100	17600	8490	7430	6240	11100	3660	30100	489	567	3350
12	40	6730	17000	6130	7540	2200	11100	4100	22800	91	475	3590
13	39	3390	19100	10400	7060	692	11100	4740	17900	79	607	1270
14	85	2420	23200	5770	7350	145	9270	5750	11600	70	1500	83
15	57	2860	23200	6080	5110	123	10900	3340	11100	196	775	2920
16	41	2850	23200	7060	5440	144	8090	8790	11500	255	351	3650
17	1200	2620	23300	6100	8660	2240	6530	10600	11000	1610	94	1070
18	1620	3780	20900	1750	6440	3160	6890	10100	8240	809	3470	912
19	4350	4100	16700	1640	9960	2950	7000	15300	6350	289	4950	1340
20	16000	2680	15900	4310	7490	6490	7500	30500	6430	76	4220	443
21	16100	6500	8230	4040	4880	6630	9270	32900	5290	182	4540	62
22	16100	10500	8620	4160	3250	2940	11100	32700	4790	290	5480	838
23	16200	4510	10800	7260	3360	1890	21000	29700	7750	557	1580	1430
24	16200	386	10500	3740	9380	5730	22800	29000	11500	1040	1260	740
25	16100	1680	10300	3840	7170	6560	20300	27600	12400	3600	4640	378
26	16100	7860	10700	3920	6650	6540	17000	27500	12400	1390	4780	258
27	16000	8210	11000	8220	6320	6230	17100	28900	11900	104	1310	49
28	16100	15800	8560	11300	6110	6020	13900	33800	6710	1850	115	42
29	16100	15900	8060	9680	---	3050	9690	33700	6650	5980	5220	2150
30	16000	16000	8880	6520	---	723	11600	31100	9330	5130	5560	904
31	16000	---	5370	7530	---	5330	---	27900	---	5140	2280	---
TOTAL	200909	257006	530620	201120	178020	133937	334100	516830	441640	80183	64786	50992
MEAN	6481	8567	17120	6488	6358	4321	11140	16670	14720	2587	2090	1700
MAX	16200	16000	30700	11300	9960	9060	22800	33800	33700	10600	5560	4550
MIN	36	386	5370	1640	2900	123	5620	3340	4790	70	94	42
AC-FT	398500	509800	1052000	398900	353100	265700	662700	1025000	876000	159000	128500	101100
CAL YR 1985	TOTAL	4549307		MEAN	12460	MAX	39800	MIN	36	AC-FT	9024000	
WTR YR 1986	TOTAL	2990143		MEAN	8192	MAX	33800	MIN	36	AC-FT	5931000	



## ARKANSAS RIVER BASIN

199

07245000 CANADIAN RIVER NEAR WHITEFIELD, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1944-64, 1967 to September 1986 (discontinued).

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: September 1944 to February 1945, September 1946 to September 1964, October 1966 to September 1986.

WATER TEMPERATURE.--September 1944 to February 1945, September 1946 to September 1964, October 1966 to September 1986.

REMARKS.--Samples were collected by a local observer on a daily basis. Additional samples were collected bimonthly and specific conductance, pH, water temperature, dissolved oxygen, and alkalinity were determined in the field.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 22,900 microsiemens, Nov. 11, 1956; minimum daily, 36 microsiemens, May 19, 1980.

WATER TEMPERATURE: Maximum daily, 39.0 °C, July 16, 1981; minimum daily, 0.0 °C on many days during winter periods.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 698 microsiemens, Dec. 29; minimum daily, 372 microsiemens, Feb. 19, 23.

WATER TEMPERATURE: Maximum daily, 32.0 °C, July 17, 26, 31; minimum daily, 2.0 °C, Dec. 22, Feb. 11, 14.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)
OCT 23...	1145	1028	80020	10.69	16500	471	7.60	24.5	22.5	14	760
NOV 13...	1300	1028	80020	6.26	893	531	7.90	23.5	18.5	9.0	760
JAN 22...	1400	1028	80020	--	4840	379	7.71	9.0	9.0	32	770
MAR 04...	1430	1028	80020	--	12400	365	7.60	18.0	14.0	31	770
MAY 27...	1530	1028	80020	13.10	27800	444	7.96	27.5	23.0	30	760
JUL 08...	1130	1028	80020	--	340	409	7.89	31.0	27.5	2.2	760
SEP 17...	1115	1028	80020	--	420	244	7.76	27.5	23.0	110	760

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOC- CI FECAL, KF AGAR (COLS./ PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
OCT 23...	7.7	89	120	82	130	30	33	12	34	35	1
NOV 13...	8.9	95	49	51	130	27	33	12	35	36	1
JAN 22...	10.6	91	K7	--	110	22	28	9.8	31	37	1
MAR 04...	12.2	117	K4	K4	100	23	26	9.6	30	37	1
MAY 27...	12.4	145	10	8	120	15	30	11	38	40	2
JUL 08...	10.8	137	20	7	140	2	36	11	33	34	1
SEP 17...	11.4	133	9400	11000	79	0	20	7.1	20	34	1

## ARKANSAS RIVER BASIN

07245000 CANADIAN RIVER NEAR WHITEFIELD, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)
OCT 23...	3.2	124	0	102	4.9	24	56	0.30	3.9	228	230
NOV 13...	3.4	128	0	105	2.6	26	57	0.20	--	240	270
JAN 22...	3.6	108	0	89	3.3	18	49	0.20	5.9	202	200
MAR 04...	3.5	100	0	82	4.0	20	46	0.30	6.2	204	190
MAY 27...	3.2	86	0	105	1.5	34	59	0.20	5.5	251	220
JUL 08...	3.3	110	0	134	2.3	31	49	0.20	7.3	245	230
SEP 17...	3.2	70	0	85	1.9	20	28	0.20	5.3	183	140

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)
OCT 23...	0.31	10200	--	--	<0.010	--	0.240	0.030	0.060	0.08
NOV 13...	0.33	579	0.140	0.62	0.010	0.03	0.150	0.030	0.010	0.01
JAN 22...	0.27	2640	--	--	<0.010	--	0.480	0.030	0.080	0.10
MAR 04...	0.28	6830	0.470	--	0.010	0.03	0.480	0.050	0.040	0.05
MAY 27...	0.34	18800	0.510	--	0.020	0.07	0.530	0.060	0.130	0.17
JUL 08...	0.33	225	0.350	--	0.010	0.03	0.360	0.040	0.030	0.04
SEP 17...	0.25	208	0.160	--	0.020	0.07	0.180	0.060	0.070	0.09

DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
OCT 23...	0.37	0.40	0.050	0.15	0.030	0.020	0.06	20	1	110
NOV 13...	0.47	0.50	0.050	0.15	0.030	0.010	0.03	--	--	--
JAN 22...	0.47	0.50	0.070	--	0.060	0.050	0.15	30	1	110
MAR 04...	0.35	0.40	0.080	--	0.050	0.050	0.15	30	1	85
MAY 27...	0.44	0.50	0.110	--	0.060	0.040	0.12	--	--	--
JUL 08...	0.26	0.30	0.050	--	0.190	0.160	0.49	<10	<1	120
SEP 17...	0.84	0.90	0.100	--	0.090	0.020	0.06	--	--	--

## ARKANSAS RIVER BASIN

07245000 CANADIAN RIVER NEAR WHITEFIELD, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
OCT 23...	<0.5	1	<1	<3	4	11	1	9	28	0.1
NOV 13...	--	--	--	--	--	--	--	--	--	--
JAN 22...	0.5	<1	<1	<3	3	18	3	6	6	--
MAR 04...	<1	<1	<1	<3	2	24	2	4	4	--
MAY 27...	--	--	--	--	--	--	--	--	--	--
JUL 08...	<0.5	1	<1	<3	3	15	<5	8	31	<0.1
SEP 17...	--	--	--	--	--	--	--	--	--	--
DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 23...	<10	2	<1	<1	290	<6	16	18	802	77
NOV 13...	--	--	--	--	--	--	--	12	29	91
JAN 22...	<10	5	<1	<1	260	<6	6	16	209	99
MAR 04...	<10	1	<1	<1	250	<6	18	--	--	--
MAY 27...	--	--	--	--	--	--	--	34	2550	86
JUL 08...	<10	2	<1	<1	310	<6	22	6	5.5	86
SEP 17...	--	--	--	--	--	--	--	194	220	89

## ARKANSAS RIVER BASIN

## 07245000 CANADIAN RIVER NEAR WHITEFIELD, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	630	428	594	637	375	519	381	553	624	555	472	514
2	615	434	582	690	376	634	411	582	483	590	472	552
3	609	433	585	680	378	547	394	560	463	561	472	526
4	605	422	651	624	379	636	395	569	497	570	459	583
5	554	426	580	577	380	584	394	563	485	559	409	527
6	680	432	695	582	377	614	395	559	506	654	409	536
7	621	421	654	590	378	582	384	562	494	636	410	568
8	660	421	560	680	377	554	400	570	490	569	410	511
9	567	420	682	610	376	620	408	654	491	568	411	542
10	611	420	550	683	378	616	411	602	444	588	410	539
11	571	420	602	597	384	606	402	614	443	640	470	508
12	663	420	669	676	382	615	553	632	435	428	490	606
13	668	421	667	678	380	609	544	599	433	425	489	502
14	411	421	665	679	379	605	553	608	433	426	494	632
15	565	612	650	645	380	541	550	591	433	426	480	444
16	413	613	650	677	379	588	542	609	435	425	484	439
17	564	614	695	654	380	552	564	624	435	427	481	439
18	412	614	605	377	381	587	669	584	433	427	486	440
19	472	613	611	380	372	497	671	620	434	424	563	439
20	410	656	679	374	374	565	590	649	433	424	592	440
21	408	614	640	375	373	559	589	617	436	424	581	439
22	494	624	637	374	373	549	564	632	433	425	579	442
23	527	628	641	374	372	396	668	680	436	424	656	462
24	520	675	679	377	375	399	543	584	437	424	657	464
25	559	664	660	375	373	395	632	683	435	424	584	469
26	531	675	633	376	375	394	678	461	658	426	606	443
27	580	665	682	375	377	410	674	630	662	426	625	443
28	599	676	676	374	638	394	622	618	664	496	654	443
29	649	676	698	375	---	395	636	466	657	497	626	518
30	450	677	666	377	---	394	622	462	662	497	626	644
31	446	---	697	376	---	399	---	616	---	495	---	---
MEAN	550	541	643	523	386	528	528	592	493	493	519	502
WTR YR 1986		MEAN	526	MAX	698	MIN	372					

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26.0	20.0	10.0	4.0	8.0	7.0	11.0	18.0	21.0	28.0	30.0	26.0
2	24.0	22.0	8.0	3.0	5.0	6.0	14.0	20.0	20.0	29.0	29.0	24.0
3	27.0	21.0	11.0	5.0	6.0	6.0	12.0	16.0	23.0	27.0	31.0	27.0
4	26.0	18.0	10.0	4.0	5.0	7.0	11.0	17.0	23.0	27.0	29.0	28.0
5	26.0	16.0	12.0	3.0	3.0	5.0	10.0	18.0	22.0	27.0	29.0	26.0
6	28.0	18.0	9.0	5.0	4.0	6.0	13.0	17.0	20.0	29.0	28.0	25.0
7	28.0	17.0	8.0	7.0	3.0	11.0	11.0	18.0	23.0	27.0	30.0	24.0
8	29.0	12.0	10.0	4.0	5.0	10.0	12.0	19.0	20.0	27.0	29.0	25.0
9	28.0	17.0	8.0	6.0	4.0	8.0	16.0	18.0	22.0	28.0	30.0	23.0
10	22.0	16.0	4.0	5.0	3.0	9.0	12.0	16.0	25.0	28.0	29.0	25.0
11	31.0	14.0	3.0	6.0	2.0	7.0	14.0	18.0	23.0	29.0	30.0	26.0
12	30.0	18.0	5.0	4.0	3.0	9.0	16.0	17.0	25.0	30.0	29.0	25.0
13	30.0	20.0	5.0	3.0	4.0	6.0	13.0	17.0	24.0	29.0	29.0	28.0
14	25.0	18.0	6.0	6.0	2.0	10.0	14.0	16.0	27.0	28.0	30.0	27.0
15	25.0	16.0	4.0	5.0	4.0	9.0	12.0	15.0	27.0	31.0	28.0	26.0
16	27.0	13.0	3.0	6.0	10.0	11.0	12.0	17.0	26.0	29.0	29.0	24.0
17	28.0	15.0	4.0	4.0	9.0	10.0	14.0	18.0	28.0	32.0	27.0	23.0
18	26.0	12.0	3.0	3.0	8.0	11.0	15.0	18.0	25.0	30.0	30.0	24.0
19	25.0	14.0	6.0	4.0	8.0	9.0	14.0	16.0	24.0	30.0	29.0	23.0
20	26.0	15.0	5.0	6.0	6.0	10.0	14.0	18.0	26.0	31.0	28.0	24.0
21	26.0	14.0	4.0	5.0	5.0	7.0	12.0	17.0	28.0	30.0	27.0	22.0
22	24.0	11.0	2.0	4.0	6.0	6.0	14.0	15.0	24.0	29.0	30.0	24.0
23	26.0	12.0	4.0	7.0	5.0	11.0	13.0	18.0	24.0	30.0	28.0	22.0
24	25.0	13.0	4.0	5.0	7.0	9.0	16.0	20.0	25.0	30.0	31.0	23.0
25	23.0	14.0	3.0	5.0	6.0	10.0	13.0	22.0	27.0	29.0	29.0	21.0
26	26.0	11.0	5.0	4.0	8.0	11.0	15.0	20.0	28.0	32.0	28.0	23.0
27	25.0	10.0	6.0	5.0	8.0	12.0	16.0	23.0	27.0	31.0	27.0	21.0
28	23.0	11.0	5.0	7.0	6.0	13.0	14.0	21.0	29.0	31.0	26.0	21.0
29	22.0	9.0	6.0	5.0	---	12.0	16.0	19.0	28.0	29.0	27.0	23.0
30	23.0	8.0	4.0	6.0	---	11.0	18.0	20.0	26.0	30.0	29.0	22.0
31	16.0	---	5.0	7.0	---	12.0	---	23.0	---	32.0	---	---
MEAN	25.5	15.0	6.0	5.0	5.5	9.0	13.5	18.0	24.5	29.5	29.0	24.0
WTR YR 1986		MEAN	17.0	MAX	32.0	MIN	2.0					

## ARKANSAS RIVER BASIN

203

07246400 ROBERT S. KERR LOCK AND DAM (ARKANSAS RIVER) NEAR SALLISAW, OK

LOCATION.--Lat 35°20'57", long 94°46'43", in SW 1/4 SW 1/4, sec. 9, T.10 N., R.24 E., LeFlore County, Hydrologic Unit 11110104, from lock wall at dam, 0.5 mi upstream from gage on bridge on U.S. Highway 59, 3.5 mi downstream from Sans Bois Creek, 7.5 mi south of Sallisaw, and at mile 395.4.

DRAINAGE AREA.--147,756 mi<sup>2</sup> of which 22,241 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--Water years 1970 to current year.

REVISED RECORDS.--WDR OK-77-1: Drainage area.

REMARKS.--Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)
OCT									
22...	1530	1028	80020	709	7.00	22.0	20.5	762	9.0
NOV									
14...	1415	1028	80020	*522	7.50	21.5	18.5	760	10.3
DEC									
31...	0830	1028	80020	*706	8.00	3.5	6.0	770	13.0
JAN									
21...	1515	1028	80020	654	7.40	9.5	10.5	760	8.4
FEB									
12...	1415	1028	80020	*768	8.60	0.5	6.0	770	7.2
MAR									
06...	1300	1028	80020	551	8.40	17.0	13.0	770	11.0
APR									
16...	1330	1028	80020	462	8.40	18.5	18.0	770	13.6
MAY									
29...	0830	1028	80020	616	8.40	22.0	23.5	760	9.4
JUN									
12...	1550	1028	80020	385	8.80	33.5	27.0	760	7.2
JUL									
09...	1505	1028	80020	714	7.70	35.5	30.5	760	6.2
AUG									
20...	1335	1028	80020	773	8.20	36.0	30.5	760	6.4
SEP									
19...	1200	1028	80020	779	7.96	28.0	24.5	760	6.2

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
OCT									
22...	100	23	120	36	35	7.6	87	60	4
NOV									
14...	110	20	130	49	39	8.3	50	44	2
DEC									
31...	104	--	140	49	42	8.2	77	54	3
JAN									
21...	76	26	150	54	45	10	75	51	3
FEB									
12...	57	<10	160	58	46	12	110	59	4
MAR									
06...	103	26	140	38	42	9.0	55	45	2
APR									
16...	142	--	140	28	42	7.6	40	38	2
MAY									
29...	111	15	150	32	42	10	62	47	2
JUN									
12...	91	16	120	32	34	8.0	35	38	1
JUL									
09...	83	25	150	33	43	11	91	56	3
AUG									
20...	86	15	150	36	45	10	92	56	3
SEP									
19...	75	27	160	41	44	11	110	60	4

\* SPECIFIC CONDUCTANCE, LAB (US/CM)

## ARKANSAS RIVER BASIN

07246400 ROBERT S. KERR LOCK AND DAM (ARKANSAS RIVER) NEAR SALLISAW, OK

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
OCT 22...	3.9	101	0	83	16	44	140	370
NOV 14...	3.5	117	0	83	5.9	34	75	280
DEC 31...	4.1	110	0	90	1.7	40	130	362
JAN 21...	4.3	122	0	100	7.7	60	130	384
FEB 12...	4.2	120	5.0	106	0.5	64	150	427
MAR 06...	3.6	117	5.0	104	0.7	51	88	308
APR 16...	3.0	122	5.0	108	0.8	45	62	269
MAY 29...	3.2	115	12	114	0.7	48	91	346
JUN 12...	3.6	105	0	86	0.3	35	44	227
JUL 09...	4.0	146	0	120	4.6	54	140	428
AUG 20...	4.2	144	0	118	1.4	63	150	468
SEP 19...	4.2	139	0	114	2.4	56	160	480



## ARKANSAS RIVER BASIN

205

07247500 FOURCHE MALINE NEAR RED OAK, OK

LOCATION.--Lat 34°54'45", long 95°09'20", in NW 1/4 NW 1/4 sec.13, T.5 N., R.20 E., Latimer County, Hydrologic Unit 11110105, on downstream side of left abutment of county road bridge, 0.1 mi downstream from Little Fourche Maline, 5.0 mi southwest of Red Oak, and at mile 41.2.

DRAINAGE AREA.--122 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area. WSP 1631: 1940.

GAGE.--Water-stage recorder. Datum of gage is 540.80 ft, National Geodetic Vertical Datum of 1929. Prior to April 25, 1939, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by several flood-retarding structures.

AVERAGE DISCHARGE.--48 years, 129 ft<sup>3</sup>/s, 14.36 in/yr, 93,460 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 41,500 ft<sup>3</sup>/s, May 19, 1960, gage height, 24.79 ft, from floodmarks, from rating curve extended above 25,000 ft<sup>3</sup>/s; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1935 reached a stage of 25.4 ft, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft<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)
Nov. 19	0015	*5,250	*17.28	June 5	2040	3,060	15.75
Apr. 5	*	4,170	16.70				

Minimum daily discharge, 1.7 ft<sup>3</sup>/s, Aug. 3-5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	87	948	24	6.0	19	49	98	351	19	2.0	2.6
2	11	68	690	23	5.8	17	53	146	248	16	1.9	2.7
3	8.5	57	476	21	139	16	63	109	490	15	1.7	6.7
4	6.6	49	375	19	338	15	1230	89	692	14	1.7	7.4
5	5.1	43	243	17	201	14	2920	78	1460	14	1.7	9.8
6	4.3	38	136	17	1130	13	1150	72	2080	14	2.0	8.9
7	4.4	32	106	18	912	12	794	66	901	13	2.2	7.8
8	3.9	29	92	18	759	11	665	61	768	12	2.3	7.0
9	2.4	25	81	16	526	9.9	551	55	1200	8.4	3.8	6.1
10	3.7	21	90	14	314	11	423	61	470	8.0	6.4	5.6
11	3.7	17	172	13	193	86	330	94	307	7.6	6.2	5.4
12	3.7	15	215	12	142	1300	815	72	206	7.3	7.2	5.0
13	33	15	153	12	111	720	585	59	123	6.9	6.2	4.8
14	42	228	117	10	98	531	363	53	65	6.6	4.5	4.6
15	39	1830	99	10	92	391	264	557	42	6.3	2.2	4.6
16	35	1330	92	12	93	330	194	579	685	5.0	3.1	4.6
17	31	851	87	11	86	225	157	694	562	3.8	3.3	4.8
18	345	3570	79	11	72	292	146	698	212	3.6	4.4	4.7
19	589	4120	70	11	61	421	645	372	110	3.6	4.0	4.8
20	251	1830	63	11	52	255	1680	218	76	3.6	3.5	4.9
21	94	1130	57	11	45	179	933	146	58	3.4	3.0	5.0
22	55	973	53	10	40	142	636	143	46	3.6	2.8	5.0
23	44	897	49	9.0	36	119	455	161	39	3.5	2.6	5.2
24	105	840	44	8.4	34	101	261	1030	31	3.4	2.5	5.9
25	291	765	39	8.4	30	88	144	2330	29	3.4	2.4	4.5
26	209	888	34	8.3	28	78	116	1100	29	3.3	2.5	4.4
27	83	1800	31	7.6	25	72	106	762	28	3.0	2.7	4.4
28	77	1270	30	6.9	22	67	142	631	26	2.9	3.9	4.2
29	310	838	28	6.2	---	61	116	568	25	2.5	3.0	4.4
30	264	671	27	6.1	---	56	97	401	23	2.4	2.8	4.4
31	132	---	25	6.1	---	51	---	355	---	2.3	2.8	---
TOTAL	3099.3	24327	4801	388.0	5590.8	5702.9	16083	11858	11382	221.4	101.3	160.2
MEAN	100	811	155	12.5	200	184	536	383	379	7.14	3.27	5.34
MAX	589	4120	948	24	1130	1300	2920	2330	2080	19	7.2	9.8
MIN	2.4	15	25	6.1	5.8	9.9	49	53	23	2.3	1.7	2.6
AC-FT	6150	48250	9520	770	11090	11310	31900	23520	22580	439	201	318
CAL YR 1985	TOTAL 73299.8	MEAN 201	MAX 4120	MIN .02	AC-FT 145400							
WTR YR 1986	TOTAL 83714.4	MEAN 229	MAX 4120	MIN 1.7	AC-FT 166000							

## ARKANSAS RIVER BASIN

07248000 WISTER LAKE NEAR WISTER, OK

LOCATION.--Lat 34°56'10", long 94°43'10", in SE 1/4 NE 1/4 sec.1, T.5 N., R.24 E., Le Flore County, Hydrologic Unit 11110105, in control tower near right end of Wister Dam on Poteau River, 2.0 mi south of Wister, 2.7 mi upstream from Caston Creek, and at mile 60.9.

DRAINAGE AREA.--993 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1949 to current year. Prior to October 1970, published as Wister Reservoir near Wister.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earth dam with outlets of an uncontrolled, concrete, chute-type spillway and six 7- by 12-foot vertical liftgates. Regulated storage began Oct. 4, 1949, conservation pool was first filled Dec. 19, 1949. Capacity, 427,900 acre-ft at elevation 502.5 ft crest of spillway and 27,060 acre-ft at elevation 471.6 ft conservation pool. Figures given herein represent total contents. Reservoir is used for flood control and recreation. Revised capacity table used since Oct. 1, 1973.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 507,400 acre-ft, May 27, 1957, elevation, 505.73 ft; minimum since conservation pool was first filled, 4,020 acre-ft, Oct. 16, 1961, elevation, 456.97 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 341,500 acre-ft, Dec. 2, elevation, 498.51 ft; minimum, 39,420 acre-ft, Mar. 7, elevation, 474.29 ft.

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

471	24,720	485	128,100
475	43,240	495	274,700
479	69,990	505	487,900

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48560	63960	340200	47000	41280	40370	40370	51180	83770	71060	58930	58930
2	48500	62670	340100	46130	41490	40370	40370	48210	85970	68160	58650	58860
3	48440	60820	333700	45150	45440	40320	40530	45210	95800	66400	58510	59630
4	48330	60120	325600	44160	59350	40270	49650	41860	102000	65720	58300	60120
5	48210	60470	316100	42970	63350	40110	75740	40690	133300	64730	58160	60540
6	48100	60820	305300	42180	95720	40000	84300	40590	187400	63890	58930	60540
7	48100	60960	294400	41750	116700	39580	87690	40900	213400	63730	59420	60540
8	47920	60960	282900	41700	124800	39520	85440	41330	227900	63730	59490	60400
9	47860	61310	271200	41650	128000	40110	80770	41700	236000	63500	59420	60400
10	47860	61450	259400	41490	126100	39740	75170	42340	234400	63350	59980	60190
11	47860	61520	249000	41380	119600	40270	68850	42600	228200	63280	59910	60190
12	47920	61800	240200	41280	111000	44160	66860	43190	220100	62970	59840	59980
13	47860	61870	230200	41120	102000	48560	63430	43640	209600	62670	59700	59910
14	47860	62220	218700	41120	92610	48900	60190	45260	197900	62440	59700	59770
15	48560	69000	206900	41120	83770	46880	55640	70150	185500	62220	60120	59700
16	48620	79090	195000	41170	74180	44570	50350	79530	173500	62220	60190	59770
17	48560	88450	183200	41170	65110	43300	45730	105500	164500	61800	60120	59700
18	50540	104100	170900	42230	56200	43410	44160	119000	155900	61590	59980	59630
19	52820	157600	158400	42870	50860	43470	62970	121800	146000	61310	59910	59560
20	54470	177600	145400	43470	46770	43080	110000	116800	135800	61100	59700	59420
21	55170	187000	132500	43530	44800	42290	131200	108900	125500	60820	59560	59350
22	55230	185800	119900	43190	43640	41430	134700	100200	115300	60820	59490	59280
23	56060	179200	106400	43190	42440	40370	128700	94500	105900	60680	59350	59140
24	56410	174600	91280	42180	41810	40000	120200	94120	97580	60540	59210	59070
25	56830	168300	80770	41590	41430	40320	109400	95440	90150	60330	59070	59000
26	57530	188000	69610	40960	40960	40370	98280	97680	86940	60190	58930	58860
27	58650	282700	62590	40590	40480	40480	87120	98480	76570	59980	59280	58650
28	58650	322300	58650	40530	40370	40530	75910	96780	73770	59770	59280	58510
29	60050	332700	54350	40740	---	40530	65260	94120	77880	59560	59070	58440
30	62150	335500	49720	40850	---	40480	56550	90900	74840	59350	58930	58300
31	63960	---	48150	41060	---	40370	---	87220	---	59070	58860	---
MAX	63960	335500	340200	47000	128000	48900	134700	121800	236000	71060	60190	60540
MIN	47860	60120	48150	40530	40370	39520	40370	40590	73770	59070	58160	58300
(+)	478.21	498.21	475.85	474.59	474.46	474.46	477.17	481.02	479.60	477.54	477.51	477.43
(++)	+15,340	+271,540	-287,350	-7,090	-690	0	+16,180	+30,670	-12,380	-15,770	-210	-560
CAL YR 1985	MAX	340200	MIN	41380	(++)	-261,150						
WTR YR 1986	MAX	340200	MIN	39520	(++)	+9,680						

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

## 07300500 SALT FORK RED RIVER AT MANGUM, OK

LOCATION.--Lat 34°51'32", long 99°30'28", in SW 1/4 SE 1/4 sec.34. T.5 N, R.22 W., Greer County, Hydrologic Unit 11120202, near left bank on downstream side of pier of bridge on State Highway 34, 0.5 mi south of Mangum, 13.0 mi downstream from Fish Creek, and at mile 35.5.

DRAINAGE AREA.--1,566 mi<sup>2</sup> of which 209 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--April 1905 to June 1906, October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area. WSP 1241: 1938.

GAGE.--Water-stage recorder. Datum of gage is 1,490.87 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation). Apr. 11, 1905 to June 30, 1906, nonrecording gage at site 0.2 mi upstream at different datum. Oct. 1, 1937 to Nov. 8, 1938, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Dec. 1-3, 13-15, 17, Jan. 7-10, Feb. 10-11, and July 19. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--49 years, (water years 1938-86), 84.4 ft<sup>3</sup>/s, 61,150 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 72,000 ft<sup>3</sup>/s, May 16, 1957, gage height, 14.55 ft; maximum gage height 14.7 ft, June 16, 1938; no flow at times in each year except 1975 and 1986.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft<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)
June 10	0330	*5,130	*9.36	No peak greater than base discharge.			
Minimum daily discharge, 0.35 ft <sup>3</sup> /s, Oct. 6.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	31	40	43	28	30	12	14	280	78	1.7	1980
2	8.0	30	28	43	29	29	40	13	704	90	2.2	377
3	4.7	29	30	41	30	28	35	11	438	52	2.8	621
4	3.2	30	38	38	29	27	29	8.6	563	43	3.6	748
5	1.6	30	57	36	29	26	22	7.2	1170	35	2.3	667
6	.35	21	65	35	30	24	19	6.0	644	27	64	508
7	.42	26	59	28	37	22	17	4.8	284	23	201	353
8	.42	25	58	24	48	21	14	7.0	195	20	12	223
9	68	24	53	22	55	20	14	8.4	114	18	7.1	162
10	659	24	47	26	50	18	15	6.3	1860	15	6.7	133
11	771	26	39	40	45	17	16	5.4	562	13	4.9	98
12	235	29	34	38	74	18	18	4.1	274	10	17	76
13	285	26	25	35	92	18	18	3.2	137	7.7	3.1	54
14	159	385	30	36	124	20	18	4.1	81	6.4	2.6	553
15	83	220	40	35	163	28	16	7.9	86	5.6	288	363
16	57	141	62	34	148	40	14	8.0	101	4.9	378	563
17	74	96	65	33	121	38	12	29	200	4.0	159	244
18	435	78	90	33	100	39	10	855	114	3.5	61	158
19	98	57	88	32	81	44	11	288	105	3.0	30	87
20	40	47	84	32	65	37	17	171	180	4.9	19	72
21	59	44	68	29	53	33	17	89	155	40	12	54
22	57	43	60	26	51	30	18	50	434	33	8.7	55
23	50	43	57	26	48	24	15	35	864	15	7.4	54
24	47	40	52	26	46	21	12	31	342	8.0	6.4	57
25	44	42	47	25	43	18	9.9	1190	126	5.6	6.4	96
26	43	44	44	24	41	17	8.7	975	79	4.6	5.1	185
27	36	44	42	24	36	16	36	671	59	4.0	95	114
28	34	44	41	24	32	14	32	367	51	3.3	67	89
29	32	43	41	25	---	13	21	211	43	2.6	78	485
30	29	47	42	24	---	12	16	165	37	1.9	31	228
31	28	---	43	25	---	12	---	150	---	1.9	610	---
TOTAL	3468.69	1809	1569	962	1728	754	552.6	5396.0	10282	583.9	2193.0	9457
MEAN	112	60.3	50.6	31.0	61.7	24.3	18.4	174	343	18.8	70.7	315
MAX	771	385	90	43	163	44	40	1190	1860	90	610	1980
MIN	.35	21	25	22	28	12	8.7	3.2	37	1.9	1.7	54
AC-FT	6880	3590	3110	1910	3430	1500	1100	10700	20390	1160	4350	18760
CAL YR 1985	TOTAL	29722.45		MEAN	81.4	MAX	1820	MIN	.00	AC-FT	58950	
WTR YR 1986	TOTAL	38755.19		MEAN	106	MAX	1980	MIN	.35	AC-FT	76870	

## RED RIVER BASIN

07301110 SALT FORK RED RIVER NEAR ELMER, OK

LOCATION.--Lat 34°28'44", long 99°22'55", in NW 1/4 NE 1/4 sec.15, T.1 S., R.21 W., Jackson County, Hydrologic Unit 11120202, on right bank at bridge on State Highway 5, 1.7 mi west of Elmer, and at mile 3.5.

DRAINAGE AREA.--1,878 mi<sup>2</sup>, of which 209 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1, 1979, to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,258.55 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 11-13, Nov. 28, Dec. 2, 7, 11, 25, Jan. 14, Feb. 10, 15, 24, 25, Feb. 28 to Mar. 12, 25, Mar. 29 to Apr. 1, 8, and Sept. 17-28. Records poor.

AVERAGE DISCHARGE.--7 years, 166 ft<sup>3</sup>/s, 120,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,900 ft<sup>3</sup>/s, October 20, 1983, gage height, 15.35 ft from high-water mark; minimum daily discharge, 0.08 ft<sup>3</sup>/s, Sept. 4, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft<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. 18	Unknown	*7,910	*10.10 (HWM)	No other peak greater than base discharge.			
Minimum daily discharge, 6.8 ft <sup>3</sup> /s, May 8.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	498	87	83	73	53	56	14	34	138	97	75	2650
2	253	83	69	71	48	52	27	26	308	127	68	2230
3	150	79	66	71	51	47	44	20	552	197	69	1360
4	104	79	69	71	56	43	89	16	374	132	87	3660
5	69	73	79	71	57	40	59	13	1710	100	64	4590
6	66	71	85	68	59	39	51	14	1330	73	100	2980
7	64	69	85	66	71	38	44	9.2	616	66	260	1110
8	51	66	87	59	68	35	36	6.8	335	61	297	612
9	46	62	85	54	71	33	32	103	238	56	101	434
10	64	59	83	61	263	31	31	263	861	40	119	367
11	87	57	73	66	155	30	30	164	1230	48	86	295
12	124	59	69	66	91	29	31	64	427	54	57	242
13	1780	66	69	66	134	29	32	37	250	29	52	199
14	2270	91	71	66	164	28	27	24	155	20	47	175
15	571	656	71	66	340	36	25	747	138	19	83	1780
16	316	715	79	66	161	41	23	243	246	23	321	791
17	241	311	89	66	137	44	22	1350	430	26	392	600
18	3240	213	102	66	132	48	17	2230	320	29	260	360
19	3700	167	108	64	122	47	25	683	197	31	146	220
20	733	139	111	64	113	44	31	254	166	36	99	160
21	325	120	117	61	100	43	28	146	165	93	106	140
22	236	111	111	59	83	41	27	85	205	216	124	130
23	187	108	104	59	75	40	24	46	845	129	96	120
24	164	106	100	57	69	34	25	28	1060	85	89	120
25	161	102	87	56	66	30	24	475	732	69	105	130
26	134	93	81	54	61	29	22	2040	307	64	97	370
27	113	87	75	54	64	28	33	1090	177	56	139	210
28	106	85	75	53	60	23	50	962	128	47	485	180
29	100	85	73	51	---	20	53	297	111	41	263	501
30	93	85	73	48	---	17	43	206	97	39	172	1770
31	87	---	73	48	---	15	---	170	---	37	680	---
TOTAL	16133	4184	2602	1921	2924	1110	1019	11846.0	13848	2140	5139	28486
MEAN	520	139	83.9	62.0	104	35.8	34.0	382	462	69.0	166	950
MAX	3700	715	117	73	340	56	89	2230	1710	216	680	4590
MIN	46	57	66	48	48	15	14	6.8	97	19	47	120
AC-FT	32000	8300	5160	3810	5800	2200	2020	23500	27470	4240	10190	56500

CAL YR 1985 TOTAL 75083.6 MEAN 206 MAX 3810 MIN 2.0 AC-FT 148900  
WTR YR 1986 TOTAL 91352.0 MEAN 250 MAX 4590 MIN 6.8 AC-FT 181200

## RED RIVER BASIN

209

07301110 SALT FORK RED RIVER NEAR ELMER, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1978 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1978 to January 1982.

WATER TEMPERATURE: October 1978 to January 1982.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)
NOV 07...	0830	1028	80020	3.13	66	4690	7.70	12.5	9.5	7.1	730
DEC 17...	0930	1028	1028	3.46	79	4010	7.70	6.5	1.5	--	740
JAN 29...	1150	1028	1028	3.31	47	4400	7.80	13.0	7.5	--	--
FEB 26...	1320	1028	80020	3.49	60	4280	7.80	27.5	18.5	9.0	720
APR 15...	1300	1028	80020	3.16	25	4910	8.00	23.5	22.0	9.1	730
MAY 28...	1825	1028	1028	4.89	720	1350	8.00	33.0	24.0	--	--
JUL 15...	1430	1028	80020	3.22	16	5350	8.30	39.0	32.5	6.0	730

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS./ PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO
NOV 07...	11.0	102	--	--	1800	1600	460	150	420	34	4
DEC 17...	14.8	110	K18	--	--	--	--	--	--	--	--
JAN 29...	--	--	--	--	--	--	--	--	--	--	--
FEB 26...	11.2	128	K20	K10	1600	1400	420	130	320	30	4
APR 15...	10.4	126	33	K3	1900	1800	500	160	430	33	4
MAY 28...	--	--	--	--	--	--	--	--	--	--	--
JUL 15...	8.4	123	140	--	1900	1800	460	180	510	37	5

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HC03)	CAR- BONATE IT-FLD (MG/L AS C03)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)
NOV 07...	6.5	227	0	186	7.2	1600	740	0.50	13	3390	3500
DEC 17...	--	256	0	210	8.1	--	--	--	--	--	--
JAN 29...	--	--	--	--	--	--	--	--	--	--	--
FEB 26...	6.3	190	0	156	4.8	1500	540	0.50	9.4	3230	3000
APR 15...	7.3	183	0	150	2.9	1600	710	0.50	7.0	4060	3500
MAY 28...	--	--	--	--	--	--	--	--	--	--	--
JUL 15...	9.7	--	--	--	1.2	1700	950	0.50	7.6	3950	3900

## 07301110 SALT FORK RED RIVER NEAR ELMER, OK--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N03)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N02)	NITRO- GEN, N02+N03 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)
NOV 07...	4.6	604	1.48	6.6	0.020	0.07	1.50	0.210	0.200	0.26
DEC 17...	--	--	--	--	--	--	--	--	--	--
JAN 29...	--	--	--	--	--	--	--	--	--	--
FEB 26...	4.4	526	0.780	--	0.040	0.13	0.820	0.190	0.160	0.21
APR 15...	5.5	276	0.430	--	0.030	0.10	0.460	0.320	0.340	0.44
MAY 28...	--	--	--	--	--	--	--	--	--	--
JUL 15...	5.4	175	--	--	<0.010	--	<0.100	0.360	0.290	0.37
DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS P04)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
NOV 07...	0.49	0.70	0.060	0.18	0.030	0.020	0.06	<10	3	90
DEC 17...	--	--	--	--	--	--	--	--	--	--
JAN 29...	--	--	--	--	--	--	--	--	--	--
FEB 26...	0.61	0.80	0.110	--	0.040	0.040	0.12	<10	2	46
APR 15...	0.48	0.80	0.080	--	<0.010	<0.010	--	10	2	46
MAY 28...	--	--	--	--	--	--	--	--	--	--
JUL 15...	1.9	2.3	0.110	--	0.010	<0.010	--	--	--	--
DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
NOV 07...	<0.5	<3	<1	<3	2	34	1	120	52	<0.1
DEC 17...	--	--	--	--	--	--	--	--	--	--
JAN 29...	--	--	--	--	--	--	--	--	--	--
FEB 26...	<3	1	2	<6	3	8	3	91	43	<0.1
APR 15...	2	<3	<1	<9	4	14	1	140	93	<0.1
MAY 28...	--	--	--	--	--	--	--	--	--	--
JUL 15...	--	--	--	--	--	--	--	--	--	--
DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 07...	<10	<1	6	<1	5500	<6	23	33	5.9	67
DEC 17...	--	--	--	--	--	--	--	--	--	--
JAN 29...	--	--	--	--	--	--	--	--	--	--
FEB 26...	<10	<1	6	<1	4900	<6	19	19	3.1	70
APR 15...	<30	1	6	<1	5900	<18	28	35	2.4	83
MAY 28...	--	--	--	--	--	--	--	--	--	--
JUL 15...	--	--	--	--	--	--	--	19	0.84	38



## RED RIVER BASIN

211

07301420 SWEETWATER CREEK NEAR SWEETWATER, OK

LOCATION.--Lat 35°25'25", long 99°58'08", on east-west line of north boundary, in NW 1/4 NE 1/4 sec.20, T.11 N, R.26 W., Roger Mills-Beckham County line, Hydrologic Unit 11120302, on right bank downstream bridge piling of State Highway 152, 0.4 mi downstream from Freezeout Creek, 3.3 mi west of Sweetwater, and at mile 16.0.

DRAINAGE AREA.--424 mi<sup>2</sup>, of which 20 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--April 22, 1986 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,087.76 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

EXTREMES FOR CURRENT PERIOD.--Apr. 22 to Sept. 30: Maximum discharge, 151 ft<sup>3</sup>/s, May 18, gage height, 11.06 ft; minimum daily discharge, 0.17 ft<sup>3</sup>/s, Aug. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	12	29	15	.76	1.8
2	---	---	---	---	---	---	---	11	35	24	.63	2.0
3	---	---	---	---	---	---	---	11	46	20	.74	2.6
4	---	---	---	---	---	---	---	9.9	54	16	.88	2.5
5	---	---	---	---	---	---	---	9.5	49	13	.84	2.6
6	---	---	---	---	---	---	---	8.6	57	11	.67	2.9
7	---	---	---	---	---	---	---	7.6	51	9.9	.53	2.9
8	---	---	---	---	---	---	---	7.2	39	9.3	.51	2.7
9	---	---	---	---	---	---	---	7.3	36	8.6	.54	2.5
10	---	---	---	---	---	---	---	11	37	8.3	.76	2.4
11	---	---	---	---	---	---	---	8.6	30	9.9	.80	2.3
12	---	---	---	---	---	---	---	7.7	26	7.4	.74	1.9
13	---	---	---	---	---	---	---	6.8	23	7.2	.63	1.6
14	---	---	---	---	---	---	---	6.5	20	8.7	.56	1.8
15	---	---	---	---	---	---	---	12	20	6.5	.56	2.0
16	---	---	---	---	---	---	---	31	19	5.6	.61	2.0
17	---	---	---	---	---	---	---	85	19	4.9	.62	2.0
18	---	---	---	---	---	---	---	138	21	4.5	.56	1.6
19	---	---	---	---	---	---	---	86	22	4.1	.56	1.3
20	---	---	---	---	---	---	---	57	22	3.7	.36	1.1
21	---	---	---	---	---	---	---	44	20	3.5	.19	.99
22	---	---	---	---	---	---	---	14	35	18	.17	.95
23	---	---	---	---	---	---	---	13	29	17	.25	2.9
24	---	---	---	---	---	---	---	13	25	16	.29	25
25	---	---	---	---	---	---	---	12	26	15	.22	58
26	---	---	---	---	---	---	---	12	29	14	.21	22
27	---	---	---	---	---	---	---	13	29	13	.81	13
28	---	---	---	---	---	---	---	16	31	12	.76	9.8
29	---	---	---	---	---	---	---	16	28	12	.84	35
30	---	---	---	---	---	---	---	14	25	11	.93	56
31	---	---	---	---	---	---	---	24	---	.84	1.5	---
TOTAL	---	---	---	---	---	---	---	858.7	803	220.17	18.84	266.14
MEAN	---	---	---	---	---	---	---	27.7	26.8	7.10	.61	8.87
MAX	---	---	---	---	---	---	---	138	57	24	1.5	58
MIN	---	---	---	---	---	---	---	6.5	11	.84	.17	.95
AC-FT	---	---	---	---	---	---	---	1700	1590	437	37	528

## RED RIVER BASIN

07301500 NORTH FORK RED RIVER NEAR CARTER, OK

LOCATION.--Lat 35°10'05", long 99°30'25", in NW 1/4 SE 1/4 sec.15, T.8 N., R.22 W., Beckham County, Hydrologic Unit 11120302, near left bank on downstream side of pier of bridge on State Highway 34, 3.0 mi south of Carter, 10.8 mi downstream from Timber Creek, and at mile 110.5.

DRAINAGE AREA.--2,337 mi<sup>2</sup>, of which 399 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1944 to September 1962. Annual maximum and occasional low-flow measurements, water years 1963-64. August 1964 to current year.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,673.71 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 14, 15, Jan. 7-10, and Feb. 10-13. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--40 years, (1945-62, 1965-86) 114 ft<sup>3</sup>/s, 82,590 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,400 ft<sup>3</sup>/s, May 26, 1959, maximum gage height, 14.98 ft, May 17, 1977; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,200 ft<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)
Sept. 30	1715	*4,240	*8.02	No other peak greater than base discharge.			
No flow at times.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	121	67	53	61	59	62	33	15	184	72	.00	62
2	65	62	53	61	58	59	38	14	910	110	.00	20
3	46	62	53	60	58	53	39	12	432	91	.00	8.1
4	34	62	53	58	60	50	36	10	318	98	.00	49
5	25	60	55	56	60	52	33	9.1	263	67	.00	159
6	19	59	62	53	62	50	32	7.5	339	45	.00	70
7	15	56	73	49	69	49	30	6.8	346	83	.00	25
8	13	53	76	43	76	48	29	6.4	570	47	.00	15
9	21	53	63	36	87	47	26	6.4	503	29	.00	8.2
10	49	50	59	36	80	45	26	6.7	342	19	.25	6.3
11	376	48	56	46	80	43	26	6.3	590	16	.67	5.0
12	504	50	55	59	90	45	30	5.5	266	13	.00	3.8
13	409	55	55	64	95	46	30	5.1	139	11	.00	3.1
14	405	70	56	62	98	44	28	8.1	93	10	.79	37
15	249	159	51	61	156	49	28	8.1	72	8.2	1.1	268
16	183	144	57	60	180	52	27	8.3	80	6.2	.08	73
17	161	115	87	58	144	51	24	39	72	4.9	.00	22
18	186	93	98	58	116	69	25	250	67	4.1	.00	11
19	179	76	105	58	100	71	26	391	110	3.5	.00	7.0
20	150	66	100	57	94	66	27	271	156	3.1	.00	5.2
21	129	58	89	57	84	62	26	153	109	2.8	.00	3.8
22	118	54	89	54	75	57	23	91	106	2.5	.00	3.1
23	113	52	78	52	71	54	22	62	206	2.2	.00	2.8
24	106	51	71	53	68	50	18	47	122	1.7	.00	4.4
25	95	51	64	50	68	47	16	273	101	1.3	.00	224
26	86	53	61	49	69	45	16	585	70	1.2	.00	157
27	82	51	61	49	67	40	20	294	48	.90	.45	84
28	78	52	58	52	63	39	20	376	40	.64	.36	58
29	74	50	59	53	---	36	16	182	35	.48	.27	279
30	69	52	61	52	---	35	15	132	26	.19	.00	2640
31	65	---	62	54	---	32	---	109	---	.00	8.4	---
TOTAL	4225	1984	2073	1671	2387	1548	785	3390.3	6715	754.91	12.37	4313.8
MEAN	136	66.1	66.9	53.9	85.2	49.9	26.2	109	224	24.4	.40	144
MAX	504	159	105	64	180	71	39	585	910	110	8.4	2640
MIN	13	48	51	36	58	32	15	5.1	26	.00	.00	2.8
AC-FT	8380	3940	4110	3310	4730	3070	1560	6720	13320	1500	25	8560

CAL YR 1985 TOTAL 26399.76 MEAN 72.3 MAX 890 MIN .00 AC-FT 52360  
WTR YR 1986 TOTAL 29859.31 MEAN 81.8 MAX 2640 MIN .00 AC-FT 59230

## RED RIVER BASIN

213

07302500 LAKE ALTUS AT LUGERT, OK

LOCATION.--Lat 34°53'15", long 99°17'47", in SW 1/4 SE 1/4 sec.22, T.5 N., R.20 W., Kiowa County, Hydrologic Unit 11120302, on upstream face of Altus Dam on North Fork Red River, 1.0 mi west of Lugert, 2.6 mi upstream from Elm Fork of North Fork, and at mile 73.5.

DRAINAGE AREA.--2,515 mi<sup>2</sup>, of which 399 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--December 1943 to September 1950 (monthly records only), October 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation). Prior to Nov. 19, 1948, nonrecording or float gage at same site and datum.

REMARKS.--Reservoir is formed by concrete and coursed masonry dam. Storage began in December 1943. Capacity, 134,600 acre-ft at elevation 1,559.0 ft, crest of uncontrolled spillway, and 72,500 acre-ft at elevation 1,547.0 ft, crest of controlled spillway. Dead storage, 1,660 acre-ft below elevation 1,517.5 ft, sill of headgate at irrigation canal. Figures given herein represent total contents. Reservoir is used for flood control, municipal water supply for city of Altus, and irrigation of about 48,000 acres. Revised capacity table used since Jan. 1, 1969. From 1927 to 1943, a dam to form reservoir for municipal water supply was at same site. Elevation of crest was 1,514.31 ft.

COOPERATION.--Data on diversions furnished by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 170,600 ft<sup>3</sup>/s, May 19, 1951, elevation 1,562.10 ft; minimum after initial storage, 4,690 acre-ft, Aug. 25, 1944, elevation, 1,520.2 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 67,240 acre-ft, July 8, 9, elevation 1,545.67 ft; minimum, 7,840 acre-ft, Oct. 1, elevation, 1,523.12 ft.

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

1525	10,750	1540	46,560
1529	18,160	1548	76,680
1534	29,420	1559	134,500

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7870	20210	26540	30520	33600	37620	39600	40850	46690	66510	47410	32750
2	7920	20280	26430	30750	33760	37710	39550	40790	47080	66600	46210	33020
3	7940	20480	26570	30820	33980	37800	40130	40790	48230	66780	45360	33360
4	8030	20500	26680	30980	34010	37850	40010	40580	48790	66640	44730	33680
5	8060	20560	26770	31000	34090	37940	40160	40420	49220	66640	43870	33900
6	8080	20690	26820	31280	34170	37880	40040	40330	49480	66820	43340	34220
7	8080	20710	27100	31210	34430	38120	40300	40510	50080	66860	43220	34350
8	8080	20770	27320	31260	34510	37800	40600	40730	50520	66990	42980	34410
9	8160	20830	27590	31330	34620	38380	40420	40910	51030	66860	42670	34460
10	8450	20970	27710	31440	34700	38200	40360	40970	57960	66820	42250	34490
11	8910	21120	27790	31590	34820	38260	40450	40910	59130	66640	41670	34650
12	11590	21300	27910	31640	34900	38440	40510	40970	59930	66300	40850	34650
13	12850	21570	27880	31720	35070	38470	41000	40880	60110	65690	40130	34650
14	13840	22410	27910	31870	35290	38580	40480	40940	60890	64820	39370	35210
15	14140	23560	28050	31900	35400	38760	40480	40670	61340	63680	38990	35210
16	14660	24000	28180	32130	35770	38870	40390	41270	61680	62470	38700	35600
17	15380	24310	28350	32270	36020	38870	40250	41580	61870	61310	38410	35650
18	16450	24600	28490	32350	36300	39080	40450	41640	62170	60080	37800	35740
19	16990	24760	28710	32480	36490	38990	40640	41940	62290	58770	36890	35790
20	17350	24950	28930	32590	36630	39110	40730	42250	62590	57420	35960	35820
21	17680	25090	29100	32720	36750	39080	40670	42490	63110	57050	34930	35770
22	17790	25250	29320	32750	36800	39110	40550	42730	63490	56660	34140	35850
23	17960	25430	29600	32590	37000	39110	40610	42820	65600	56160	33360	35770
24	18370	25570	29650	32940	37080	39110	40450	43100	66080	55670	32480	35880
25	19040	25760	29650	33070	37250	39200	40450	43250	65910	55280	31720	35710
26	19380	25960	29900	33100	37390	39430	40580	44510	66040	54650	31210	36020
27	19590	26010	30030	33150	37420	39340	40730	45110	66170	53870	31230	36160
28	19800	26100	30160	33260	37470	39430	40820	45490	66210	52930	30950	36770
29	20020	26270	30290	33340	---	39430	40580	45960	66120	51780	30570	39520
30	20210	26470	30490	33340	---	39400	40880	46280	66040	50450	30210	41640
31	20210	---	30520	33360	---	39550	---	46470	---	48920	31540	---
MAX	20210	26470	30520	33360	37470	39550	41000	46470	66210	66990	47410	41640
MIN	7870	20210	26430	30520	33600	37620	39550	40330	46690	48920	30210	32750
(+)	1529.97	1532.78	1534.43	1535.52	1537.01	1537.72	1538.17	1539.97	1545.43	1540.72	1534.83	1538.42
(++)	+12,420	+6,260	+4,050	+2,840	+4,110	+2,080	+1,330	+5,590	+19,570	-17,120	-17,380	+10,100
(+++)	0	0	0	0	0	0	0	0	0	0	0	0
CAL YR 1985	MAX	39390	MIN	6340	(++)	+18,860	(+++)	30,787				
WTR YR 1986	MAX	66990	MIN	7870	(++)	+33,850	(+++)	0				

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

(+++) DIVERSIONS, IN ACRE-Feet

## 07303000 NORTH FORK RED RIVER BELOW ALTUS DAM, NEAR LUGERT, OK

LOCATION.--Lat 34°53'26", long 99°18'22", in SW 1/4 sec.22, T.5 N., R.20 W., Greer County, Hydrologic Unit 11120303, on right bank at State Highway 44A bridge, 3,500 ft downstream from Altus Dam, 1.9 mi upstream from Elm Fork of North Fork, 2.0 mi west of Lugert, and at mile 72.8.

DRAINAGE AREA.--2,515 mi<sup>2</sup>, of which 399 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--March 1930 to December 1932 (published as "at Lugert Dam"), December 1943 to September 1950 (published as spill from Lake Altus), October 1950 to September 1962, August 1964 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1311: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,471.81 ft, National Geodetic Vertical Datum of 1929. Mar. 19, 1930 to Dec. 21, 1932, nonrecording gage at former Lugert Dam, 0.7 mi upstream at datum 1,504.31 ft National Geodetic Vertical Datum of 1929, unadjusted.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation at low flow by Lugert Lake prior to December 1943, capacity 13,500 acre-ft and completely regulated thereafter by Lake Altus (station 07302500). Diversions at Lake Altus bypass most of streamflow. Seepage from Altus Dam not included for period February 1953 to September 1977.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,100 ft<sup>3</sup>/s, May 18, 1951, gage height, 12.70 ft, maximum gage height, 16.37 ft, May 21, 1977 (backwater from Elm Fork of the North Fork Red River); no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 16, 1928, reached a stage of 14.5 ft, site and datum in use 1930-32, discharge, 14,300 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7.0 ft<sup>3</sup>/s, Sept. 29, gage height, 5.79 ft; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.21	.17	.02	.00	.00	.00	.00	.00	.00	.00	.82
2	.00	.18	.15	.03	.00	.00	.00	.00	.00	.00	.00	.59
3	.00	.16	.14	.03	.00	.00	.00	.00	.00	.00	.00	.76
4	.00	.15	.17	.03	.00	.00	.00	.00	.00	.00	.00	.74
5	.00	.15	.13	.03	.00	.00	.00	.00	.00	.00	.00	.79
6	.00	.14	.11	.04	.00	.07	.00	.00	.00	.00	.00	.53
7	.00	.13	.12	.02	.13	.00	.00	.00	.00	.00	.00	.37
8	.00	.14	.15	.00	.23	.00	.00	.00	.00	.00	.00	.28
9	.00	.06	.16	.04	.21	.00	.00	.00	.00	.00	.00	.24
10	.00	.00	.14	.02	.28	.00	.00	.00	.00	.00	.00	.23
11	.00	.00	.13	.00	.24	.00	.00	.00	.00	.00	.00	.07
12	.00	.04	.14	.01	.19	.00	.00	.00	.00	.00	.00	.05
13	.00	.12	.15	.01	.15	.01	.00	.00	.00	.00	.00	.00
14	.07	.33	.14	.02	.16	.13	.00	.00	.00	.00	.00	.46
15	.07	.43	.14	.00	.14	.19	.00	.00	.39	.00	.00	.57
16	.07	.34	.07	.00	.14	.29	.00	.00	.33	.00	.00	.43
17	.76	.30	.00	.00	.14	.30	.00	.00	.32	.00	.00	.34
18	1.7	.31	.00	.00	.14	.29	.00	.00	.26	.00	.00	.14
19	.69	.27	.01	.00	.10	.28	.00	.00	.21	.00	.00	.01
20	.52	.23	.01	.00	.01	.33	.00	.00	.13	.00	.00	.00
21	.45	.23	.00	.00	.00	.33	.00	.00	.07	.00	.00	.00
22	.43	.23	.01	.00	.00	.28	.00	.00	.00	.00	.00	.00
23	.46	.22	.02	.00	.00	.12	.00	.00	.00	.00	.00	.00
24	.50	.18	.00	.00	.00	.11	.00	.00	.00	.00	.00	.00
25	.98	.19	.00	.00	.00	.21	.00	.00	.00	.00	.00	.00
26	.69	.22	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00
27	.47	.16	.00	.00	.00	.00	.00	.00	.00	.00	.50	.00
28	.34	.14	.00	.00	.00	.00	.00	.00	.00	.00	.42	.09
29	.25	.15	.00	.00	---	.00	.00	.00	.00	.00	.29	2.3
30	.17	.21	.01	.00	---	.00	.00	.00	.00	.00	.18	.76
31	.16	---	.01	.00	---	.00	---	.00	---	.00	2.0	---
TOTAL	8.78	5.62	2.28	.30	2.26	3.04	.00	.00	1.71	.00	3.39	10.57
MEAN	.28	.19	.074	.010	.081	.098	.000	.000	.057	.000	.11	.35
MAX	1.7	.43	.17	.04	.28	.33	.00	.00	.39	.00	2.0	2.3
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	17	11	4.5	.6	4.5	6.0	.00	.00	3.4	.00	6.7	21

CAL YR 1985 TOTAL 36.07 MEAN .099 MAX 1.7 MIN .00 AC-FT 72  
WTR YR 1986 TOTAL 37.95 MEAN .10 MAX 2.3 MIN .00 AC-FT 75

## RED RIVER BASIN

215

## 07304500 ELK CREEK NEAR HOBART, OK

LOCATION.--Lat 34°54'51", long 99°06'49", in NE 1/4 NE 1/4 sec.17, T.5 N., R.18 W., Kiowa County, Hydrologic Unit 11120303, near right bank on downstream side of pier of county road bridge, 7.0 mi downstream from Little Elk Creek, 7.5 mi south of Hobart, and at mile 10.9.

DRAINAGE AREA.--549 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1904 to March 1908, October 1949 to current year.

REVISED RECORDS.--WSP 1211: Drainage area. WSP 1241: 1905. WDR OK-86-1: 1984 (M).

GAGE.--Water-stage recorder. Datum of gage is 1,429.4 ft, National Geodetic Vertical Datum of 1929. See WSP 1920 for history of changes prior to Apr. 28, 1954.

REMARKS.--Estimated daily discharges: Oct. 1 to Nov. 7, Nov. 9-13, 19, 20, Apr. 10-15, 17-29, June 20-22, 26-30, and July 15, 16, 18-29. Records fair. Part of high flows are diverted 1.0 mi above station, by means of a breach canal (U.S. Bureau of Reclamation), into Tom Steed Reservoir.

AVERAGE DISCHARGE.--40 years, (water years 1905-07, 1950-86), 74.6 ft<sup>3</sup>/s, 54,050 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, revised, 22,400 ft<sup>3</sup>/s, Oct. 4, 1955, gage height, 30.75 ft; maximum gage height, 30.94 ft, Oct. 20, 1983; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,200 ft<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)
June 10	1830	*13,100	*30.42	Sept. 29	1800	12,900	30.40
Sept. 1	0815	3,070	22.06				

Minimum daily discharge, 7.1 ft<sup>3</sup>/s, Apr. 23.

REVISIONS.--The maximum discharge for water year 1984 has been revised to 18,600 ft<sup>3</sup>/s, Oct. 20, 1983, gage height, 30.94 ft, and supersedes peak of record published in reports for 1984 and 1985.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	280	12	15	17	13	15	11	12	10	134	26	2610
2	180	11	13	17	13	15	17	11	10	191	23	348
3	100	10	16	16	14	14	19	9.0	91	143	24	54
4	80	9.8	15	16	14	14	17	7.8	84	98	26	45
5	60	9.5	16	16	14	14	15	7.6	41	75	26	50
6	49	9.4	16	16	14	13	13	7.5	34	64	26	198
7	40	9.6	16	15	14	13	13	7.4	33	61	25	155
8	30	9.9	16	14	15	13	12	7.4	54	713	25	110
9	24	11	16	15	15	13	11	7.9	87	435	24	67
10	20	11	16	15	15	13	10	14	5890	203	25	56
11	19	12	16	15	14	13	9.5	21	5600	128	27	52
12	370	13	16	15	15	13	9.0	10	300	107	33	52
13	130	17	15	15	15	13	8.8	10	165	133	32	48
14	450	23	16	15	15	13	8.6	9.9	144	97	26	85
15	180	1330	16	14	16	13	8.6	217	688	81	26	86
16	110	357	16	14	17	13	8.5	60	133	60	33	565
17	88	77	16	14	17	15	8.3	735	107	52	33	123
18	70	40	17	14	18	21	8.0	227	89	47	29	69
19	3400	21	16	13	17	18	7.8	79	188	44	33	48
20	900	17	16	13	16	16	7.5	33	170	42	29	40
21	350	17	16	13	16	16	7.3	21	115	40	24	36
22	170	16	16	13	15	15	7.2	16	98	38	23	34
23	110	16	16	12	15	14	7.1	13	210	36	21	33
24	88	16	18	12	15	14	7.4	14	982	35	21	31
25	80	16	18	14	15	13	8.4	39	434	34	20	30
26	92	16	18	13	15	13	9.1	41	210	33	26	30
27	400	16	18	12	15	13	13	39	135	32	122	581
28	130	15	18	12	14	13	17	31	88	31	60	287
29	52	15	18	12	---	12	14	17	77	29	38	5260
30	31	15	17	12	---	12	11	13	66	28	39	5540
31	16	---	17	13	---	11	---	12	---	27	1180	---
TOTAL	8099	2168.2	505	437	421	431	324.1	1749.5	16333	3271	2125	16723
MEAN	261	72.3	16.3	14.1	15.0	13.9	10.8	56.4	544	106	68.5	557
MAX	3400	1330	18	17	18	21	19	735	5890	713	1180	5540
MIN	16	9.4	13	12	13	11	7.1	7.4	10	27	20	30
AC-FT	16060	4300	1000	867	835	855	643	3470	32400	6490	4210	33170

CAL YR 1985 TOTAL 19859.7 MEAN 54.4 MAX 3400 MIN .41 AC-FT 39390  
WTR YR 1986 TOTAL 52586.8 MEAN 144 MAX 5890 MIN 7.1 AC-FT 104300

## RED RIVER BASIN

07304500 ELK CREEK NEAR HOBART, OK--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949-52, 1954-63, 1970 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1949 to September 1951, October 1958 to September 1963, November 1969 to current year.

WATER TEMPERATURE: October 1949 to September 1951, October 1958 to September 1963, November 1969 to current year.

REMARKS.--Samples were collected by a local observer on a daily basis. Additional samples were collected periodically and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,030 microsiemens, May 8, 1985; minimum daily, 108 microsiemens, Oct. 19, 1983.

WATER TEMPERATURE: Maximum daily, 35.0 °C, July 8, 1951; minimum daily, -0.5 °C on many days during winter periods.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,430 microsiemens, Apr. 8; minimum daily, 215 microsiemens, Oct. 18.

WATER TEMPERATURE: Maximum daily, 28.0 °C on several days during summer months; minimum daily, 1.0 °C, Dec. 14.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	DIS- SOLVED (PER- CENT SATUR- ATION)
NOV 08...	0830	1028	80020	9.9	2220	7.60	10.0	11.0	720	9.0	87
JAN 22...	1150	1028	80020	13	2130	8.07	9.5	5.0	730	14.4	119
FEB 27...	1200	1028	80020	15	2140	8.50	24.5	13.0	730	15.2	152
APR 16...	1200	1028	80020	8.5	*2210	9.00	17.0	16.5	730	13.4	144
MAY 20...	1700	1028	80020	32	*852	7.90	32.5	24.0	720	7.0	88
JUL 17...	1330	1028	80020	52	1100	8.30	38.5	27.0	730	8.0	105
SEP 16...	1800	1028	80020	649	439	8.00	36.0	27.5	720	6.4	86

DATE	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB TOT FLD (MG/L AS CACO3)	CALCUM DJ,-- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)
NOV 08...	860	530	190	93	170	30	3	7.1	405	0	332
JAN 22...	810	500	160	100	160	30	3	4.9	384	0	315
FEB 27...	860	550	180	100	170	30	3	5.0	341	20	312
APR 16...	870	570	150	120	180	31	3	6.6	--	--	--
MAY 20...	300	170	68	31	58	29	2	9.2	161	0	132
JUL 17...	450	210	99	49	88	30	2	6.8	--	--	--
SEP 16...	150	55	36	14	35	33	1	7.8	--	--	--

\* SPECIFIC CONDUCTANCE, LAB (US/CM)



07304500 ELK CREEK NEAR HOBART, OK--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)
NOV 08...	16	600	220	0.40	15	1490	1500	2.0	40	<100	6
JAN 22...	5.2	710	170	0.50	3.6	1590	1500	2.2	55	--	--
FEB 27...	1.7	800	170	0.60	4.1	1740	1600	2.4	71	<100	4
APR 16...	0.6	700	180	0.50	0.6	1630	1500	2.2	37	--	--
MAY 20...	3.2	210	72	0.30	11	558	540	0.76	49	90	4
JUL 17...	2.3	280	76	0.40	11	778	760	1.1	109	--	--
SEP 16...	1.8	73	46	0.20	10	--	280	0.38	487	--	--

[illegible]

## RED RIVER BASIN

07304500 ELK CREEK NEAR HOBART, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	301	1520	2140	---	2130	2160	2010	2030	1630	1370	1890	285
2	368	1690	2160	---	2180	2230	2130	2170	1640	1240	1860	355
3	481	1830	2170	---	2160	2280	2070	2160	1630	1050	1900	455
4	580	1900	2100	1850	2170	2300	2150	2060	731	1330	1930	430
5	923	1920	2140	1890	2180	2280	2170	2040	732	1230	1880	382
6	796	1850	2120	1890	2190	2290	2190	1950	902	1310	1860	734
7	746	1910	2160	1880	2160	2320	2320	1880	898	1370	1960	908
8	1050	1980	2180	1910	2130	2310	2430	2000	1060	1460	2000	980
9	1140	2030	2200	1960	2140	2350	2420	2040	980	400	2030	973
10	1030	2040	2160	1930	2110	2340	2350	2010	307	557	2010	1180
11	466	2020	2110	1970	2120	2280	2330	1980	254	688	2000	1330
12	442	2040	2090	1980	2080	2250	2280	1680	408	829	2020	1430
13	743	2050	2050	1960	2100	2290	2350	1140	564	950	2080	1510
14	746	2010	2140	1990	2100	2210	2320	1250	734	768	2110	1540
15	822	796	2090	1930	2100	2120	2290	1930	378	851	1960	1370
16	830	450	2070	1910	2070	2140	2280	650	365	988	1910	770
17	953	695	2060	1940	2160	2090	2230	576	511	1080	1820	598
18	215	898	2100	1960	2250	2080	2260	483	791	1170	1720	862
19	223	1160	2110	1970	2220	2180	2310	780	1010	1320	1600	920
20	521	1310	2130	2020	2170	2130	2350	796	1390	1230	1690	1040
21	725	1510	2120	2010	2170	2090	2340	896	1550	1270	1670	1140
22	952	1660	2110	2050	2140	2080	2320	1040	1650	1380	1660	1240
23	1220	1790	2090	2040	2130	2100	2320	1200	639	1470	1670	1330
24	1090	1890	2070	2060	2140	2120	2290	1310	581	1660	1720	1420
25	1330	1930	2060	2070	2160	2100	2190	1380	520	1650	1690	1460
26	550	1980	2080	2070	2120	2090	2250	775	748	1720	1640	1550
27	563	2140	2000	2080	2180	2060	2420	584	922	1730	1360	1580
28	784	2200	---	2120	2160	2080	2200	1040	1100	1750	1060	487
29	897	2230	---	2100	---	2050	2100	1350	1250	1800	713	232
30	1070	2230	---	2090	---	2060	2220	1610	1340	1840	1230	241
31	1290	---	---	2130	---	2030	---	1620	---	1880	1430	---
MEAN	769	1720	2110	1990	2150	2180	2260	1430	907	1270	1740	958
WTR YR 1986	MEAN	1610	MAX	2430	MIN	215						

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.0	14.0	3.0	---	11.5	9.5	19.0	21.5	23.0	27.0	26.5	19.0
2	13.0	12.0	2.5	---	14.5	11.0	18.5	19.5	23.0	27.0	27.0	20.5
3	14.0	12.0	2.5	---	15.0	12.0	17.5	20.5	24.0	26.5	26.5	22.0
4	16.0	12.5	4.0	6.0	14.0	11.5	16.5	22.0	23.5	26.5	26.0	23.0
5	15.5	13.5	5.0	4.0	11.0	12.0	17.0	20.0	23.0	27.0	27.0	22.0
6	14.5	14.0	7.5	4.5	9.5	11.0	20.5	23.5	24.0	27.0	27.5	24.0
7	14.5	12.0	7.0	3.0	7.0	13.0	22.5	24.5	25.5	28.0	27.5	21.5
8	20.0	12.0	6.5	2.0	5.0	10.0	23.0	21.5	24.0	27.0	28.0	17.5
9	21.5	15.0	9.0	2.5	5.0	15.0	18.0	24.5	25.5	26.0	27.0	21.0
10	15.0	12.5	6.5	3.0	3.0	14.0	17.0	19.0	21.5	26.0	26.0	23.0
11	14.0	10.0	4.5	3.0	3.0	15.0	17.0	20.0	22.0	26.5	26.0	22.5
12	15.0	11.0	4.5	5.0	2.5	15.0	17.0	22.0	24.0	26.5	27.0	22.0
13	18.0	14.0	2.0	5.0	2.5	14.0	19.0	23.0	25.5	27.0	26.0	22.0
14	17.0	13.5	1.0	5.5	4.5	11.0	17.0	23.5	25.0	26.0	26.5	23.0
15	16.0	9.5	2.0	5.0	5.0	13.5	15.0	20.5	23.0	25.0	25.5	23.0
16	15.0	9.0	2.0	7.0	11.5	13.0	16.0	21.5	24.0	26.5	26.0	23.5
17	18.0	10.0	2.0	7.5	11.0	13.5	18.0	19.0	22.0	25.5	27.5	21.5
18	18.0	13.0	3.5	8.5	10.0	15.0	19.0	17.5	25.0	26.0	27.0	22.0
19	18.0	13.0	2.5	8.0	13.0	11.5	18.0	18.0	25.0	27.0	27.5	21.5
20	19.0	9.0	4.0	7.0	13.5	11.0	15.5	19.0	26.0	25.5	27.0	23.0
21	18.5	9.0	4.0	9.0	7.0	8.0	18.0	20.0	26.5	26.5	27.5	23.0
22	19.0	8.5	4.5	7.5	7.0	11.0	18.0	22.0	27.0	27.5	26.5	23.5
23	18.0	10.0	5.0	5.5	9.0	13.0	18.0	24.0	25.0	27.0	27.0	24.0
24	19.5	9.0	6.0	7.0	10.5	15.0	20.0	22.5	25.5	27.0	25.5	23.5
25	20.0	9.0	4.5	8.0	10.5	17.5	21.5	23.0	26.0	27.0	26.0	22.0
26	20.0	12.0	3.0	7.5	13.0	16.5	21.0	22.0	27.0	28.0	24.5	22.5
27	20.0	8.0	3.5	4.0	14.0	17.0	21.0	19.0	27.0	28.0	24.5	23.0
28	19.5	7.0	---	5.0	10.0	18.0	18.0	20.0	27.5	28.0	22.5	22.5
29	18.0	6.0	---	7.0	---	18.0	20.0	22.0	28.0	27.5	22.0	21.0
30	16.0	7.5	---	7.0	---	18.0	22.5	21.5	27.5	28.0	22.0	22.0
31	14.0	---	---	8.5	---	19.0	---	21.5	---	28.0	22.0	---
MEAN	17.0	11.0	4.0	6.0	9.0	13.5	18.5	21.0	25.0	27.0	26.0	22.0
WTR YR 1986	MEAN	17.0	MAX	28.0	MIN	1.0						

## RED RIVER BASIN

219

## 07305000 NORTH FORK RED RIVER NEAR HEADRICK, OK

LOCATION.--Lat 34°38'04", long 99°05'47", in NW 1/4 NE 1/4 sec.21, T.2 N., R.18 W., Tillman County, Hydrologic Unit 11120303, near left bank on downstream side of pier of bridge on old U.S. Highway 62, 2.5 mi east of Headrick, 12.9 mi upstream from Otter Creek, and at mile 33.0.

DRAINAGE AREA.--4,244 mi<sup>2</sup>, of which 399 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1905 to March 1908, October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311. Prior to July 1905, published as "near Snyder".

REVISED RECORDS.--WSP 1211: Drainage area. WSP 1241: 1905-07.

GAGE.--Water-stage recorder. Datum of gage is 1,294.83 ft, National Geodetic Vertical Datum of 1929.

Prior to July 18, 1905, nonrecording gage at site 0.2 mi downstream at different datum. July 18, 1905 to Mar. 30, 1908, nonrecording gage at Navajo dam site 10.4 mi upstream at different datum. Oct. 1, 1937 to Jan. 29, 1969, water-stage recorder at present site at datum 5.0 ft higher.

REMARKS.--Estimated daily discharges: Dec. 1, 13-15. Records good. Flow regulated since December 1943 by storage and diversion at Lake Altus, 39.5 mi above station (station 07302500). Diversions for irrigation of about 48,000 acres above station; some return flow may re-enter at Stinking Creek, 16 mi below station.

AVERAGE DISCHARGE.--(Prior to regulation by Lake Altus) 8 years (1906-07, 1938-43), 455 ft<sup>3</sup>/s, 329,600 acre-ft/yr; (since regulation by Lake Altus) 42 years (water years 1945-86), 256 ft<sup>3</sup>/s, 185,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,000 ft<sup>3</sup>/s, May 28, 1977, gage height, 17.26 ft, present datum; maximum gage height, 17.27 ft, October 21, 1983; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 21.1 ft, present datum, occurred sometime prior to 1927, from information by Oklahoma State Highway Department.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,300 ft<sup>3</sup>/s, Sept. 30, gage height, 14.56 ft; minimum daily discharge, 12 ft<sup>3</sup>/s, May 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	323	96	78	58	45	45	35	44	85	199	39	4010
2	256	85	70	58	45	45	40	35	73	219	37	3000
3	144	88	69	58	45	44	42	28	69	282	38	1790
4	70	82	69	58	44	44	45	22	452	308	41	1450
5	55	83	67	56	43	44	45	19	319	220	40	1230
6	48	70	65	56	43	43	44	16	310	176	37	1030
7	41	68	66	57	47	43	40	13	217	155	42	827
8	37	67	67	58	48	43	37	12	147	141	39	499
9	33	66	67	56	48	43	36	17	161	630	63	383
10	45	62	64	54	49	42	36	27	510	418	67	316
11	294	61	62	49	52	44	34	31	6250	271	48	276
12	413	61	62	49	52	43	34	29	5640	207	42	245
13	283	63	75	49	51	42	33	20	861	174	39	225
14	515	65	70	49	50	42	29	45	507	172	43	259
15	362	760	67	49	50	44	29	133	1300	154	44	575
16	112	1450	65	49	52	45	29	139	1490	130	41	1020
17	156	451	62	49	52	45	29	415	625	117	45	1180
18	2840	270	61	48	52	45	28	882	475	107	81	483
19	3700	187	61	48	52	44	32	397	337	98	56	354
20	1150	143	61	48	50	42	34	266	325	92	42	291
21	391	120	61	47	48	46	29	149	290	103	40	250
22	261	107	61	45	49	46	27	98	468	89	37	224
23	172	97	60	45	49	44	26	70	727	79	32	207
24	148	90	60	45	48	42	26	55	897	71	31	193
25	140	87	59	45	48	41	23	120	997	65	29	182
26	291	84	61	45	48	40	24	95	531	61	37	176
27	472	79	60	44	46	40	33	506	365	54	45	217
28	170	77	59	44	44	39	34	390	289	50	131	537
29	128	75	59	44	---	38	50	228	244	47	298	2220
30	96	76	60	44	---	37	56	144	213	43	387	9680
31	102	---	59	44	---	37	---	105	---	41	293	---
TOTAL	13248	5170	1987	1548	1350	1322	1039	4550	25174	4973	2284	33329
MEAN	427	172	64.1	49.9	48.2	42.6	34.6	147	839	160	73.7	1111
MAX	3700	1450	78	58	52	46	56	882	6250	630	387	9680
MIN	33	61	59	44	43	37	23	12	69	41	29	176
AC-FT	26280	10250	3940	3070	2680	2620	2060	9020	49930	9860	4530	66110

CAL YR 1985 TOTAL 46409 MEAN 127 MAX 3700 MIN 2.5 AC-FT 92050  
WTR YR 1986 TOTAL 95974 MEAN 263 MAX 9680 MIN 12 AC-FT 190400

## RED RIVER BASIN

07305000 NORTH FORK RED RIVER NEAR HEADRICK, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951-52, 1954-63, 1968 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1959 to September 1963, July 1968 to current year.

WATER TEMPERATURE: November 1959 to September 1963, July 1968 to current year.

INSTRUMENTATION.--Water-quality monitor from August 1959 to September 1981.

REMARKS.--Samples were collected by a local observer on a daily basis. Additional samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 23,300 microsiemens, June 8, 1974; minimum daily, 302 microsiemens, Oct. 20, 1983.

WATER TEMPERATURE: Maximum daily, 38.0 °C, July 19, 1969, Aug. 4, 1977; minimum daily, 0.0 °C on many days during winter periods.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 18,400 microsiemens, Apr. 30; minimum daily, 454 microsiemens, Sept. 30.

WATER TEMPERATURE: Maximum daily, 31.0 °C, July 24, 31; minimum daily, 0.0 °C on several days during winter period.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

											BARO- METRIC PRES- SURE	OXYGEN, DIS- SOLVED
DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	(MM OF HG)	(MG/L)
NOV 06...	1445	1028	80020	4.77	71	11400	8.40	16.5	15.5	9.7	720	10.8
JAN 30...	1430	1028	1028	4.40	43	10300	7.90	10.0	12.0	--	--	--
FEB 25...	1220	1028	80020	4.37	47	11700	8.00	33.0	18.0	1.4	730	12.1
APR 17...	1515	1028	1028	4.09	31	14000	8.60	33.0	27.5	--	--	--
MAY 21...	1420	1028	1028	5.05	152	3690	8.00	29.5	23.0	--	--	--
JUL 16...	1450	1028	80020	4.98	126	4330	8.60	35.0	30.0	80	730	9.4
DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOC CI, KF AGAR (COLS./ 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HC03)
NOV 06...	119	--	--	--	--	--	89	--	--	--	9.7	--
JAN 30...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 25...	139	K1	K4	--	--	--	--	--	--	--	10	171
APR 17...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 21...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 16...	132	47	38	620	480	160	54	600	67	11	9.2	171
DATE	CAR- BONATE IT-FLD (MG/L AS C03)	ALKA- LITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	
NOV 06...	--	--	1.5	930	3400	0.40	7.5	6140	--	--	--	
JAN 30...	--	--	--	--	--	--	--	--	--	--	--	
FEB 25...	0	140	2.7	1100	3800	0.40	--	7460	--	--	--	
APR 17...	--	--	--	--	--	--	--	--	--	--	--	
MAY 21...	--	--	--	--	--	--	--	--	--	--	--	
JUL 16...	2.4	144	0.7	480	920	0.40	11	2500	2300	3.4	850	

## RED RIVER BASIN

07305000 NORTH FORK RED RIVER NEAR HEADRICK, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)
NOV 06...	0.270	0.010	0.03	0.280	0.120	0.130	0.17	0.38	0.50	0.170	0.52
JAN 30...	--	--	--	--	--	--	--	--	--	--	--
FEB 25...	--	<0.010	--	<0.100	0.110	0.100	0.13	0.59	0.70	0.090	--
APR 17...	--	--	--	--	--	--	--	--	--	--	--
MAY 21...	--	--	--	--	--	--	--	--	--	--	--
JUL 16...	0.530	0.010	0.03	0.540	0.130	0.130	0.17	0.97	1.1	0.240	--
DATE	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
NOV 06...	0.120	0.110	0.34	<10	4	200	<1	<1	3	30	<1
JAN 30...	--	--	--	--	--	--	--	--	--	--	--
FEB 25...	0.050	0.030	0.09	10	2	--	--	2	2	--	2
APR 17...	--	--	--	--	--	--	--	--	--	--	--
MAY 21...	--	--	--	--	--	--	--	--	--	--	--
JUL 16...	0.110	0.100	0.31	--	--	--	--	--	--	--	--
DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 06...	70	20	<0.1	<1	2	<1	45	60	22	4.2	94
JAN 30...	--	--	--	--	--	--	--	--	--	--	--
FEB 25...	--	--	<0.1	<1	3	<1	--	--	5	0.63	37
APR 17...	--	--	--	--	--	--	--	--	--	--	--
MAY 21...	--	--	--	--	--	--	--	--	--	--	--
JUL 16...	--	--	--	--	--	--	--	--	110	37	94

## RED RIVER BASIN

07305000 NORTH FORK RED RIVER NEAR HEADRICK, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1500	8260	7240	10300	11400	11600	12000	8210	6200	4620	5560	635
2	6060	8490	10000	10300	10600	11500	11000	9440	7420	4680	5520	1150
3	4550	8920	9520	10600	11400	11700	10800	8300	8390	3360	5420	1490
4	3600	9080	9500	10400	11700	11600	11700	9050	8220	6790	5290	786
5	4580	9280	9900	10700	11500	11500	11900	9560	2320	3010	5600	866
6	5490	9640	9760	10400	10900	11700	12000	10000	3060	4460	6000	2790
7	6650	9880	9620	10800	9800	11600	12100	10500	1780	5530	5380	2350
8	7500	9800	9860	11200	10100	11800	11800	10700	3010	5600	5160	2100
9	8400	10000	10400	10900	9600	11900	12300	10400	5100	6090	5130	2710
10	7940	10200	5470	11500	11000	12100	11400	9220	7250	1140	5680	3470
11	10200	10300	6100	12200	11400	11400	11500	9170	715	1940	4280	4440
12	2650	10000	4980	11500	10700	11500	11600	10500	643	2390	4080	4860
13	2700	10300	10500	10400	11700	11600	11500	8530	647	3090	4400	5500
14	1790	10100	10100	10400	12200	11200	12000	7770	1590	3390	4640	5080
15	3660	10000	10100	10700	11900	10100	12100	2050	2760	3240	4650	5400
16	4840	876	10400	10800	12600	11200	12200	4840	1320	3940	6120	2460
17	5140	1720	10400	11100	12400	11800	12500	880	840	4200	7290	1460
18	1210	3540	10200	11300	12400	11800	12700	2000	1730	4320	12300	1900
19	640	5320	10600	11200	12400	12400	11100	1520	3190	4430	9260	2780
20	1730	5180	11000	11000	11500	12000	11700	5320	3150	4620	7510	3700
21	2300	5400	11200	11000	12200	11900	12000	5240	5010	4280	6790	4590
22	2980	6060	11400	11600	12100	14100	12400	5430	4410	4440	6000	5320
23	4310	6580	11700	11500	12300	14200	12700	6560	5120	5180	6070	5830
24	5400	4770	10400	11400	12100	13700	12400	6850	2230	5060	6280	6220
25	6480	6650	10800	11600	11900	13300	12200	5380	2170	5150	6210	6490
26	4830	6770	10300	11300	11600	11500	12200	4020	1500	5350	5480	6770
27	1420	6220	10200	4550	12100	10600	10000	7880	2200	5440	5170	8860
28	3260	8620	9940	5290	11600	10800	10900	3910	3300	5580	2230	6900
29	5750	8540	10200	11100	---	11500	10500	3840	3740	5660	3700	1840
30	7130	7740	10100	6090	---	11900	18400	3790	4340	5600	3040	454
31	7740	---	9860	11400	---	11200	---	5550	---	5740	2190	---
MEAN	4590	7610	9730	10500	11500	11800	12000	6660	3450	4460	5560	3640
WTR YR 1986		MEAN	7610	MAX	18400	MIN	454					

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.0	10.0	.0	5.0	13.0	10.0	17.0	19.0	23.0	27.0	30.0	24.0
2	11.0	8.0	.0	4.0	12.0	10.0	17.0	22.0	21.0	26.0	29.0	25.0
3	14.0	10.0	.0	6.0	16.0	10.0	17.0	21.0	25.0	26.0	28.0	25.0
4	15.0	10.0	2.0	4.0	12.0	13.0	17.0	20.0	23.0	28.0	28.0	24.0
5	14.0	12.0	3.0	.0	11.0	15.0	17.0	21.0	21.0	27.0	30.0	24.0
6	17.0	13.0	4.0	2.0	13.0	10.0	17.0	22.0	25.0	27.0	27.0	23.0
7	13.0	10.0	5.0	.0	10.0	9.0	20.0	21.0	23.0	27.0	26.0	25.0
8	14.0	10.0	5.0	.0	5.0	9.0	19.0	22.0	23.0	29.0	28.0	19.0
9	22.0	16.0	6.0	.0	3.0	10.0	17.0	22.0	23.0	27.0	27.0	25.0
10	12.0	9.0	6.0	1.0	.0	10.0	17.0	18.0	25.0	28.0	27.0	25.0
11	14.0	8.0	2.0	4.0	---	11.0	14.0	18.0	24.0	29.0	29.0	27.0
12	16.0	11.0	.0	5.0	.0	15.0	15.0	18.0	22.0	27.0	26.0	21.0
13	15.0	12.0	.0	3.0	.0	15.0	14.0	20.0	27.0	25.0	29.0	27.0
14	14.0	10.0	.0	4.0	6.0	16.0	15.0	20.0	27.0	26.0	27.0	25.0
15	14.0	9.0	.0	5.0	5.0	16.0	13.0	20.0	26.0	27.0	27.0	23.0
16	14.0	8.0	1.0	1.0	7.0	12.0	14.0	20.0	26.0	30.0	29.0	24.0
17	14.0	9.0	3.0	9.0	11.0	20.0	15.0	19.0	25.0	25.0	28.0	24.0
18	17.0	9.0	2.0	9.0	13.0	12.0	18.0	20.0	26.0	30.0	30.0	23.0
19	14.0	9.0	1.0	6.0	15.0	12.0	18.0	19.0	26.0	29.0	30.0	23.0
20	14.0	8.0	1.0	11.0	14.0	11.0	18.0	---	28.0	24.0	30.0	27.0
21	15.0	8.0	4.0	11.0	5.0	10.0	15.0	19.0	25.0	29.0	29.0	23.0
22	14.0	9.0	3.0	9.0	5.0	10.0	15.0	20.0	26.0	28.0	28.0	24.0
23	19.0	8.0	2.0	9.0	6.0	12.0	18.0	21.0	27.0	30.0	28.0	24.0
24	17.0	9.0	8.0	9.0	9.0	15.0	20.0	19.0	26.0	31.0	24.0	24.0
25	17.0	11.0	2.0	8.0	13.0	12.0	21.0	20.0	27.0	28.0	27.0	23.0
26	18.0	14.0	.0	7.0	14.0	14.0	20.0	22.0	26.0	29.0	24.0	24.0
27	18.0	9.0	4.0	4.0	16.0	23.0	18.0	20.0	27.0	28.0	24.0	25.0
28	17.0	8.0	4.0	4.0	10.0	16.0	17.0	22.0	28.0	30.0	27.0	25.0
29	17.0	6.0	3.0	9.0	---	20.0	20.0	22.0	27.0	30.0	24.0	25.0
30	14.0	9.0	5.0	4.0	---	17.0	20.0	21.0	27.0	29.0	24.0	25.0
31	10.0	---	4.0	4.0	---	21.0	---	24.0	---	31.0	24.0	---
MEAN	15.0	9.5	2.5	5.0	9.0	13.5	17.0	20.5	25.0	28.0	27.5	24.0
WTR YR 1986		MEAN	16.5	MAX	31.0	MIN	.0					



## 07305500 WEST OTTER CREEK AT SNYDER LAKE, NEAR MOUNTAIN PARK, OK

LOCATION.--Lat 34°44'02", long 98°59'10", in SE 1/4 NE 1/4 sec.16, T.3 N., R.17 W., Kiowa County, Hydrologic Unit 11120303, near east end of Snyder Dam, 0.8 mi upstream from small tributary, 3 mi northwest of Mountain Park, and at mile 26.0.

DRAINAGE AREA.--132 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1903 to March 1908, October 1951 to September 1971, July 1972 to current year. Published as Otter Creek near Mountain Park 1903-8 and as Otter Creek at Snyder Lake, near Mountain Park 1951-60. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1731: 1960 (M). WSP 1920: 1959-60. WDR OK-78-2: 1977.

GAGE.--Water-stage recorder and broad-crested masonry spillway. Datum of gage is 1,361.06 ft, National Geodetic Vertical Datum of 1929. April 1903 to March 1908, nonrecording gage at site 1.8 mi downstream at different datum. October 1951 to September 1971 at intake tower at same site and datum. July 1972 to August 1976, 700 ft downstream at datum 1,344.00 ft.

REMARKS.--Estimated daily discharges: Oct. 1 to Nov. 18, and Feb. 12. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. The city of Snyder diverted about 130 acre-ft annually prior to October 1958 and none thereafter. Flow completely regulated since June 1975 by Tom Steed Reservoir.

AVERAGE DISCHARGE.--(Prior to regulation by Tom Steed Reservoir) 27 years (water years 1904-7, 1952-71, 1973-75) 23.0 ft<sup>3</sup>/s, 16,660 acre-ft/yr; (since regulation by Tom Steed Reservoir) 11 years (water years 1976-86) 3.59 ft<sup>3</sup>/s, 2,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,200 ft<sup>3</sup>/s, June 6, 1953, gage height, 19.50 ft, from floodmarks, from rating curve extended above 1,600 ft<sup>3</sup>/s on basis of contracted-opening and flow-over-dam measurements of peak flow; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 194 ft<sup>3</sup>/s, Apr. 10, gage height, 12.71 ft; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	1.1	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	1.1	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.77	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.50	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.50	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.50	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.85	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	1.0	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.45	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	16	.00	.10	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	4.5	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	1.3	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.48	.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	.06
18	.00	.00	.00	.00	.00	.00	.00	.84	.00	.00	.00	.07
19	.00	.00	.00	.00	.00	.00	.00	1.4	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	1.1	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	1.1	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.50	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.18	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03
25	.00	.00	.00	.00	.00	.00	.00	7.1	.00	.00	.00	2.9
26	.00	.00	.00	.00	.00	.00	.00	18	.00	.00	.00	.75
27	.00	.00	.00	.00	.00	.00	.00	5.9	.00	.00	.00	.46
28	.00	.00	.00	.00	.00	.00	.00	2.5	.00	.00	.00	.11
29	.00	.00	.00	.00	---	.00	.00	1.2	.00	.00	.00	8.6
30	.00	.00	.00	.00	---	.00	.00	1.1	.00	.00	.00	5.2
31	.00	---	.00	.00	---	.00	---	1.1	---	.00	.00	---
TOTAL	.00	.00	.00	.00	.00	.00	22.28	42.02	6.87	.00	.00	18.18
MEAN	.000	.000	.000	.000	.000	.000	.74	1.36	.23	.000	.000	.61
MAX	.00	.00	.00	.00	.00	.00	16	18	1.1	.00	.00	8.6
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	44	83	14	.00	.00	36

CAL YR 1985 TOTAL 27.92 MEAN .076 MAX 5.4 MIN .00 AC-FT 55  
WTR YR 1986 TOTAL 89.35 MEAN .24 MAX 18 MIN .00 AC-FT 177

## RED RIVER BASIN

07307028 NORTH FORK RED RIVER NEAR TIPTON, OK

LOCATION.--Lat 34°30'25", long 99°12'28", in NW 1/4 NE 1/4 sec.5, T.1 S, R.19 W., Tillman County, Hydrologic Unit 11120303, near left bank on downstream side of bridge pier on State Highway 5, 3.8 mi west of intersection of State Highways 5 and 5C in Tipton, 4.8 mi downstream from Otter Creek, and at mile 15.3.

DRAINAGE AREA.--4,691 mi<sup>2</sup> of which 399 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--June 28, 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,234.45 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 27 to Dec. 12, 21-29, Jan. 9-17, 19, 20, Feb. 2-4, 7-16, 19-25, 28, Mar. 1, 4-14, Mar. 26 to Apr. 9, and Sept. 10-15, 20-30. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated since December 1943 by storage and diversion at Lake Altus 54.2 mi upstream (station 07302500). Diversions for irrigation of about 48,000 acres above station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,000 ft<sup>3</sup>/s, Oct. 20, 1983, gage height, 18.80 ft; minimum daily discharge, 3.7 ft<sup>3</sup>/s, Sept. 7, 1985.

EXTREMES FOR CURRENT PERIOD.--Maximum daily discharge, 12,000 ft<sup>3</sup>/s, Sept. 30; minimum daily discharge, 29 ft<sup>3</sup>/s, May 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	710	166	93	91	58	56	54	74	155	228	74	2440
2	354	145	92	80	60	56	53	61	136	217	73	4720
3	200	131	90	85	62	55	53	51	114	270	70	2190
4	143	120	91	91	64	55	52	42	298	312	70	3650
5	95	109	88	90	68	54	51	35	553	279	68	3660
6	74	105	86	83	71	53	50	32	290	205	67	2160
7	58	102	84	77	74	52	50	30	319	171	66	1080
8	53	102	83	71	77	51	50	29	197	151	64	667
9	54	95	80	66	80	50	49	59	196	290	62	505
10	129	98	79	63	82	51	50	111	207	546	63	414
11	525	95	80	60	83	52	49	80	3300	333	64	380
12	1160	95	81	59	83	53	48	76	7070	237	64	340
13	1010	91	82	58	83	53	48	61	1630	181	63	315
14	1070	103	82	60	83	54	45	82	696	156	62	300
15	699	147	90	62	82	54	41	547	1100	161	78	400
16	499	1240	91	66	82	56	41	471	2020	144	90	830
17	1240	632	91	71	80	59	40	1400	932	138	62	2030
18	4190	335	91	64	77	59	39	1380	676	120	58	1010
19	8130	234	83	62	76	58	49	958	476	105	67	555
20	3660	182	80	63	74	56	65	473	401	109	58	450
21	1210	160	83	64	72	56	52	307	382	511	82	370
22	708	168	80	67	70	55	45	205	370	442	122	325
23	485	155	79	67	68	56	41	151	625	325	58	300
24	377	122	78	66	66	56	36	123	698	144	56	280
25	248	111	79	66	64	58	37	804	1030	128	55	265
26	328	103	80	64	60	56	36	753	632	114	54	350
27	383	100	81	64	58	57	72	743	437	100	56	900
28	325	98	82	59	57	56	63	719	343	90	56	2300
29	238	95	84	59	---	54	50	375	282	84	172	7000
30	218	94	88	58	---	55	71	256	241	80	339	12000
31	191	---	91	58	---	54	---	187	---	77	643	---
TOTAL	28764	5533	2622	2114	2014	1700	1480	10675	25806	6448	3036	52186
MEAN	928	184	84.6	68.2	71.9	54.8	49.3	344	860	208	97.9	1740
MAX	8130	1240	93	91	83	59	72	1400	7070	546	643	12000
MIN	53	91	78	58	57	50	36	29	114	77	54	265
AC-FT	57050	10970	5200	4190	3990	3370	2940	21170	51190	12790	6020	103500

CAL YR 1985 TOTAL 89937 MEAN 246 MAX 8130 MIN 3.7 AC-FT 178400  
WTR YR 1986 TOTAL 142378 MEAN 390 MAX 12000 MIN 29 AC-FT 282400

## RED RIVER BASIN

225

07308500 RED RIVER NEAR BURKBURNETT, TX

LOCATION.--Lat 34°06'36", long 98°31'53", Cotton County, OK, Hydrologic Unit 11130102, on left bank at downstream side of bridge on U.S. Highways 277 and 281, 2.5 mi northeast of Burkburnett, and at mile 933.

DRAINAGE AREA.--20,570 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1924 to August 1925 (monthly discharge only), December 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 952.57 ft, National Geodetic Vertical Datum of 1929. July 11, 1924 to Aug. 31, 1925, nonrecording gage at site 1,000 ft downstream, at same datum. December 16, 1959 to Jan. 11, 1960, non-recording gage at present site and datum.

REMARKS.--Estimated daily discharges: Sept. 14, 21. Records fair, except those for periods of estimated daily discharges, which are poor. There are many small diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--26 years (water years 1961-86), 883 ft<sup>3</sup>/s, 639,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 166,000 ft<sup>3</sup>/s, Oct. 21, 1983, gage height, 16.90 ft; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 3, 1957, reached a stage of 13.54 ft, from levels to floodmarks. According to local residents, higher stages occurred in 1891 and June 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft<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. 12	0415	18,000	8.37	June 6	1100	10,500	7.78
Oct. 15	0815	10,300	7.59	Sept. 2	0445	19,300	9.68
Oct. 19	1045	*34,600	*10.95	Sept. 5	2000	25,300	10.25
May 18	0800	10,800	7.83				

Minimum discharge, 67 ft<sup>3</sup>/s, Aug. 16, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4280	943	514	325	178	262	154	208	957	487	102	4510
2	2560	881	496	315	182	252	199	186	735	466	94	12800
3	1480	814	483	309	204	247	244	185	639	2960	92	6790
4	742	771	455	313	204	242	236	169	707	4720	101	6340
5	399	727	443	313	222	227	234	151	1350	3890	98	20300
6	280	684	447	313	262	222	235	145	6630	1900	100	17100
7	205	643	441	301	268	213	240	139	3710	1360	129	8220
8	158	614	427	296	262	217	242	124	3690	961	101	4180
9	146	594	426	288	279	227	233	166	2470	689	80	2250
10	146	557	419	275	296	204	231	231	1420	537	156	1490
11	4270	535	417	257	307	222	228	610	936	491	190	1020
12	11100	509	410	258	319	257	220	817	3520	941	128	763
13	4150	504	406	242	344	252	210	598	7260	610	126	583
14	4050	519	401	232	376	232	177	325	4470	419	94	557
15	7460	557	394	222	419	208	160	195	2660	342	74	1800
16	3260	830	393	222	433	208	152	130	2430	276	76	3080
17	2420	2430	395	222	464	238	138	1100	5150	237	76	4330
18	12600	1810	399	217	496	299	129	7650	5620	213	127	2650
19	30900	1450	401	213	521	290	194	5470	3040	194	386	2530
20	15500	1110	387	204	496	257	206	3350	1770	177	332	1560
21	6400	894	396	190	441	242	202	2060	1270	166	252	1190
22	3630	764	400	174	390	242	188	1290	1110	245	199	843
23	2600	677	395	174	363	222	166	830	1080	587	168	659
24	2040	624	371	174	344	203	140	556	750	723	203	583
25	1730	579	342	165	331	190	124	513	1840	774	166	506
26	1520	567	335	162	313	178	118	572	3110	408	119	452
27	1400	538	334	158	296	186	143	5760	3120	267	124	400
28	1280	532	336	162	273	182	238	5460	1640	200	285	366
29	1440	513	336	158	---	178	230	4530	963	158	218	393
30	1190	516	331	165	---	165	217	2450	656	135	379	6680
31	1040	---	327	174	---	162	---	1390	---	114	718	---
TOTAL	130376	23686	12457	7193	9283	6926	5828	47360	74703	25647	5493	114925
MEAN	4206	790	402	232	332	223	194	1528	2490	827	177	3831
MAX	30900	2430	514	325	521	299	244	7650	7260	4720	718	20300
MIN	146	504	327	158	178	162	118	124	639	114	74	366
AC-FT	258600	46980	24710	14270	18410	13740	11560	93940	148200	50870	10900	228000
CAL YR 1985	TOTAL 492411	MEAN 1349	MAX 38100	MIN 38	AC-FT 976700							
WTR YR 1986	TOTAL 463877	MEAN 1271	MAX 30900	MIN 74	AC-FT 920100							

## RED RIVER BASIN

07308500 RED RIVER NEAR BURKBURNETT, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: July 1968 to September 1974. Chemical and biochemical: October 1974 to current year. Pesticide analyses: October 1974 to September 1982.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1968 to September 1981.

WATER TEMPERATURES: July 1968 to September 1981.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 17,400 microsiemens, July 30, 1972; minimum daily, 889 microsiemens, Sept. 24, 1970.

WATER TEMPERATURES: Maximum daily, 35.5 °C, June 29, 1980; minimum daily, 0.0 °C on many days during winter months.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	COLI- FORM, FECAL, 0.7 KF AGAR (COLS./ 100 ML)	STREP- TOCOCCHI FECAL, 0.7 KF AGAR (COLS./ 100 ML)	HARD- NESS (MG/L AS CAC03)
NOV												
14...	0845	480	9500	8.00	14.0	70	11.4	120	2.4	K38	K78	1600
JAN												
16...	1530	284	10100	7.90	14.5	7.4	11.6	123	2.0	K35	K42	1400
MAR												
19...	1500	296	9310	8.20	16.0	3.0	15.3	167	7.4	100	120	1500
MAY												
07...	1530	139	10800	8.10	25.5	18	7.0	94	7.1	K50	K28	1700
JUL												
23...	1530	819	5800	7.90	32.5	--	8.5	--	5.2	K610	K200	960
AUG												
27...	1345	107	6000	8.20	27.5	150	7.5	--	3.3	K20	K60	1100

DATE	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WH WAT TOTAL FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
NOV												
14...	1400	430	120	1600	18	9.5	189	1300	2500	0.5	11	6000
JAN												
16...	1200	340	130	1800	22	9.0	176	1100	2700	0.5	4.2	6560
MAR												
19...	1400	380	140	1600	18	9.1	156	1200	2500	0.5	2.1	6020
MAY												
07...	1500	430	140	1800	20	11	140	1400	3000	0.4	7.7	6780
JUL												
23...	840	250	80	850	12	9.5	118	800	1400	0.5	8.4	3650
AUG												
27...	990	290	90	1000	14	11	109	930	1600	0.5	7.6	3950

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHODIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHODIS- SOLVED (MG/L AS P04)
NOV 14...	6100	--	<0.01	0.71	0.17	0.20	0.53	0.7	0.10	<0.01	<0.01	--
JAN 16...	6200	0.47	0.02	0.49	0.13	0.14	0.57	0.7	0.04	0.02	0.02	0.06
MAR 19...	5900	--	<0.01	<0.10	0.18	0.14	1.1	1.3	0.14	0.01	<0.01	--
MAY 07...	6900	--	<0.01	<0.10	0.08	0.07	1.0	1.1	0.13	0.01	0.01	0.03
JUL 23...	3500	--	<0.01	<0.10	0.11	0.10	2.2	2.3	0.14	0.02	0.01	0.03
AUG 27...	4000	--	<0.01	<0.10	0.09	0.10	0.91	1.0	0.09	<0.01	<0.01	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[illegible]

## RED RIVER BASIN

## 07311000 EAST CACHE CREEK NEAR WALTERS, OK

LOCATION.--Lat 34°21'44", long 98°16'56", on south line of SE 1/4 SE 1/4 sec.19, T.2 S., R.10 W., Cotton County, Hydrologic Unit 11130202, at right bank on downstream side of bridge on State Highway 53, 1.8 mi east of Walters, 12.2 mi upstream from West Cache Creek, and at mile 19.7.

DRAINAGE AREA.--675 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1938 to December 1963; October 1969 to current year. Prior to October 1969, published as Cache Creek near Walters.

GAGE.--Water-stage recorder. Datum of gage is 938.2 ft, Oklahoma State Highway Department datum. Prior to Jan. 8, 1939, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Feb. 7-25, Feb. 27 to Mar. 1, 7, April 16, 25, May 14, 16, 17, June 4-8, 16, 21, 29, July 8, 13, 22, 28, Aug. 12, and Aug. 18 to Sept. 28, 30. Record poor. Flow partly regulated by Lake Lawtonka, capacity, 42,300 acre-ft on Medicine Creek prior to late 1953, and 63,000 acre-ft thereafter, by Lake Thomas, capacity, 8,300 acre-ft on Little Medicine Creek, and since March 1961 by Lake Ellsworth, capacity, 94,500 acre-ft on East Cache Creek. Low flow sustained by sewage effluent from cities of Lawton and Walters.

AVERAGE DISCHARGE.--42 years, 175 ft<sup>3</sup>/s, 126,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,900 ft<sup>3</sup>/s, Oct. 21, 1983, gage height, 30.66 ft; no flow at times in 1939-40.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1906 reached an approximate stage of 29.7 ft, information from local residents.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 7,800 ft<sup>3</sup>/s, Sept. 6; minimum daily discharge, 13 ft<sup>3</sup>/s, Aug. 13, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	852	398	82	72	56	57	63	66	573	52	21	540
2	282	326	183	67	48	146	60	72	555	49	22	2400
3	236	254	248	64	46	154	76	70	692	48	30	3100
4	164	177	196	59	51	155	132	52	650	50	25	2600
5	102	150	164	58	83	147	148	49	569	52	27	5200
6	98	154	163	61	173	145	113	51	522	48	26	7800
7	95	147	165	65	110	143	76	51	502	95	25	5800
8	93	157	158	58	96	145	56	52	458	158	24	4300
9	90	150	156	72	90	146	56	58	405	194	24	2400
10	98	140	151	75	88	154	59	139	407	191	23	1200
11	699	139	163	59	82	172	64	333	366	185	21	900
12	629	135	226	55	75	1620	55	193	179	146	18	700
13	622	127	205	56	72	1150	55	147	96	120	13	600
14	721	107	154	55	74	331	55	157	154	114	13	1800
15	1200	189	113	56	78	316	55	227	278	112	21	2500
16	1220	1140	87	57	91	501	59	166	150	111	21	1400
17	497	871	81	59	120	398	53	167	95	110	22	920
18	2890	472	86	61	92	452	55	1990	73	98	20	1500
19	6570	670	88	60	76	284	95	1930	68	89	19	840
20	3810	809	93	62	68	126	162	1160	59	114	18	640
21	1170	335	91	60	65	90	137	491	54	127	17	500
22	801	182	84	58	62	80	81	291	60	124	16	390
23	765	146	83	55	60	75	55	247	50	119	16	260
24	747	120	82	57	58	69	55	220	48	106	15	160
25	773	123	83	55	56	62	54	246	50	67	15	110
26	991	101	82	51	58	63	52	1070	50	35	18	80
27	916	88	82	48	56	60	135	1200	48	30	25	70
28	739	122	96	49	54	56	355	697	54	24	60	60
29	713	117	195	47	---	62	136	566	50	23	27	51
30	714	90	205	46	---	58	65	522	50	22	30	300
31	690	---	133	45	---	64	---	575	---	32	90	---
TOTAL	29987	8136	4178	1802	2138	7481	2672	13255	7365	2845	762	49121
MEAN	967	271	135	58.1	76.4	241	89.1	428	245	91.8	24.6	1637
MAX	6570	1140	248	75	173	1620	355	1990	692	194	90	7800
MIN	90	88	81	45	46	56	52	49	48	22	13	51
AC-FT	59480	16140	8290	3570	4240	14840	5300	26290	14610	5640	1510	97430

CAL YR 1985 TOTAL 174849 MEAN 479 MAX 6570 MIN 26 AC-FT 346800  
WTR YR 1986 TOTAL 129742 MEAN 355 MAX 7800 MIN 13 AC-FT 257300



## RED RIVER BASIN

229

07311000 EAST CACHE CREEK NEAR WALTERS, OK

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1947, 1948, 1951-55, 1958-63, 1970 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1951 to September 1953, October 1969 to March 1977.

WATER TEMPERATURE: October 1951 to September 1953, October 1969 to March 1977.

REMARKS.--Samples were collected periodically and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)
OCT										
23...	1800	1028	80020	11.74	768	465	7.90	24.0	18.0	62
NOV										
18...	1745	1028	80020	9.60	453	424	7.90	20.5	13.5	63
JAN										
24...	0900	1028	80020	6.53	57	870	7.30	8.0	8.0	5.5
FEB										
26...	1300	1028	80020	6.62	58	793	7.10	23.0	13.5	6.9
MAR										
31...	1300	1028	80020	6.51	69	890	7.20	24.5	20.0	5.5
MAY										
21...	1030	1028	80020	9.64	408	492	6.80	25.0	20.0	130
JUL										
30...	1000	1028	80020	6.77	22	*589	7.60	34.0	27.0	32
SEP										
29...	1530	1028	80020	5.99	51	740	7.80	21.0	25.0	46
DATE		BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM
OCT										
23...	740	8.1	88	180	55	52	11	27	24	
NOV										
18...	730	11.2	112	150	4	47	8.7	24	24	
JAN										
24...	740	12.4	108	250	12	77	15	74	38	
FEB										
26...	730	11.6	117	240	23	71	15	72	39	
MAR										
31...	740	9.1	103	250	2	74	16	81	41	
MAY										
21...	730	7.3	84	180	14	53	11	29	26	
JUL										
30...	740	6.2	80	210	0	62	13	46	32	
SEP										
29...	730	6.2	79	200	35	57	13	69	42	
DATE		SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HC03)	CAR- BONATE IT-FLD (MG/L AS C03)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
OCT										
23...	0.9	4.7	--	--	--	2.9	72	22	276	
NOV										
18...	0.9	8.3	182	0	149	3.6	38	22	242	
JAN										
24...	2	5.3	296	0	242	24	76	73	490	
FEB										
26...	2	5.3	264	0	216	33	79	65	479	
MAR										
31...	2	5.9	304	0	249	30	86	77	529	
MAY										
21...	1	4.4	200	0	164	50	61	21	298	
JUL										
30...	1	4.6	276	0	226	11	51	36	354	
SEP										
29...	2	6.9	196	0	161	4.9	76	68	520	

\* SPECIFIC CONDUCTANCE, LAB (US/CM)

## RED RIVER BASIN

07311200 BLUE BEAVER CREEK NEAR CACHE, OK  
(Hydrologic bench-mark station)

LOCATION.--Lat 34°37'24", long 98°33'48", in NE 1/4 NE 1/4 sec.28, T.2 N., R.13 W., Comanche County, Hydrologic Unit 11130203, on downstream side of right bank pier on old U.S. Highway 62, 3,000 ft upstream from St. Louis-San Francisco Railway Co. bridge, 4.0 mi east of Cache, and at mile 12.0.

DRAINAGE AREA.--24.6 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,215.26 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Minor regulation by Lake Rush, Lake Jed Johnson, and Lake Ketch, combined surface-area 132 acres.

AVERAGE DISCHARGE.--22 years, 10.7 ft<sup>3</sup>/s, 7,750 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,600 ft<sup>3</sup>/s, Aug. 28, 1977, gage height, 18.02 ft, from floodmark, from rating curve extended above 250 ft<sup>3</sup>/s on basis of contracted-opening measurement; no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1907, that of Aug. 28, 1977, according to local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<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. 14	1015	642	9.95	May 17	0330	845	10.38
Oct. 18	0515	*2,600	*12.43	Sept. 16	1215	542	9.17
May 15	0230	785	10.26				

No flow at times during year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.1	7.2	11	2.4	1.1	1.4	2.0	1.3	19	1.2	.00	.00
2	3.2	5.7	8.5	2.5	1.1	1.5	2.1	1.1	16	1.0	.00	.00
3	1.9	4.7	7.1	2.1	1.1	1.4	3.3	1.1	14	.92	.00	.00
4	1.3	4.2	6.5	2.1	1.1	1.4	3.7	.99	15	.83	.00	.00
5	.92	4.0	6.0	2.0	1.2	1.4	3.2	.96	15	.74	.00	.00
6	.79	3.7	5.9	2.0	1.3	1.4	3.0	.94	12	.65	.00	.00
7	.64	3.4	5.4	1.8	1.5	1.3	2.7	.93	9.4	.64	.00	.00
8	.60	3.1	5.0	1.7	1.5	1.3	2.7	.92	7.5	.60	.00	.00
9	.55	3.1	4.6	1.8	1.4	1.4	2.6	1.4	6.2	.51	.00	.00
10	55	2.9	4.5	1.8	1.4	1.3	2.8	3.3	4.9	.34	.00	.13
11	35	2.8	5.8	1.7	1.1	1.7	2.3	1.5	4.0	.34	.00	.18
12	24	2.8	4.8	1.6	1.3	1.8	2.2	2.0	3.4	.37	.00	.23
13	27	7.1	4.2	1.5	1.3	1.6	2.0	2.9	3.0	.30	.00	.14
14	260	72	3.9	1.5	1.4	1.6	2.0	41	2.6	.34	.00	1.9
15	104	214	3.6	1.5	1.4	1.9	1.7	351	2.4	.24	.00	14
16	49	66	3.5	1.5	1.7	1.8	1.5	67	2.3	.09	.00	245
17	40	44	3.2	1.5	2.0	1.9	1.5	444	2.3	.05	.00	72
18	1080	41	3.0	1.5	2.0	2.0	1.8	297	2.2	.03	.00	33
19	191	34	3.3	1.4	1.9	2.1	2.8	114	2.0	.02	.00	18
20	84	26	3.2	1.4	1.7	2.6	2.1	60	1.8	.02	.00	11
21	54	19	2.9	1.4	1.5	2.8	1.6	42	1.6	.00	.00	7.2
22	42	18	2.8	1.3	1.5	2.7	1.5	30	1.5	.00	.00	4.8
23	34	16	2.7	1.4	1.6	2.6	1.5	22	2.5	.00	.00	3.6
24	26	15	2.7	1.4	1.5	2.4	1.5	18	2.1	.00	.00	2.8
25	21	13	2.6	1.3	1.5	2.3	1.4	40	1.5	.00	.00	2.2
26	18	12	2.7	1.1	1.5	2.2	1.3	77	1.4	.00	.00	1.8
27	15	12	2.5	1.1	1.5	2.3	2.7	70	1.2	.00	.00	1.5
28	13	9.4	2.3	1.2	1.4	2.1	1.6	44	.98	.00	.00	1.4
29	11	8.0	2.1	1.2	---	2.2	1.4	32	.94	.00	.00	1.4
30	10	7.9	2.1	1.1	---	2.1	1.3	25	.91	.00	.00	1.6
31	8.7	---	2.1	1.1	---	2.1	---	21	---	.00	.00	---
TOTAL	2217.70	682.0	130.5	48.9	40.5	58.6	63.8	1814.34	159.63	9.23	.00	423.88
MEAN	71.5	22.7	4.21	1.58	1.45	1.89	2.13	58.5	5.32	.30	.000	14.1
MAX	1080	214	11	2.5	2.0	2.8	3.7	444	19	1.2	.00	245
MIN	.55	2.8	2.1	1.1	1.1	1.3	1.3	.92	.91	.00	.00	.00
AC-FT	4400	1350	259	97	80	116	127	3600	317	18	.00	841

CAL YR 1985 TOTAL 10517.30 MEAN 28.8 MAX 1080 MIN .00 AC-FT 20860  
WTR YR 1986 TOTAL 5649.08 MEAN 15.5 MAX 1080 MIN .00 AC-FT 11200

## RED RIVER BASIN

231

07311200 BLUE BEAVER CREEK NEAR CACHE, OK--Continued  
(Hydrologic bench-mark station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965 to current year.

REMARKS.--Samples were collected quarterly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)
NOV 25...	1530	1028	80020	7.11	12	144	6.20	17.0	11.5	9.3	730	9.8
FEB 27...	1050	1028	80020	6.79	1.6	185	5.80	19.0	12.5	3.0	740	9.8
MAY 20...	1400	1028	80020	7.67	58	105	6.20	28.0	21.5	20	730	8.1
SEP 30...	1030	1028	80020	6.83	1.9	178	7.40	20.0	22.0	3.5	730	6.0

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOC- CI, FECAL, KF AGAR (COLS./ PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
NOV 25...	94	47	52	42	0	12	3.0	8.0	28	0.6	1.7
FEB 27...	95	23	K9	61	0	17	4.4	13	31	0.8	1.4
MAY 20...	96	92	390	35	0	10	2.4	7.3	30	0.6	1.4
SEP 30...	72	690	800	55	0	16	3.7	9.8	27	0.6	1.6

DATE	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITU- ENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)
NOV 25...	55	0	45	55	15	3.6	0.30	16	76	87	0.10
FEB 27...	80	0	66	201	13	6.5	0.30	12	100	110	0.14
MAY 20...	--	--	--	48	9.8	2.5	0.30	15	73	74	0.10
SEP 30...	--	--	--	4.7	13	4.1	0.30	16	118	100	0.16

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
NOV 25...	2.5	<0.010	0.110	0.040	0.020	0.03	0.36	0.40	0.010	0.03	0.020
FEB 27...	0.42	<0.010	<0.100	0.040	0.020	0.03	0.36	0.40	0.020	--	0.010
MAY 20...	11	<0.010	<0.100	0.060	0.030	0.04	0.24	0.30	0.030	--	<0.010
SEP 30...	0.60	<0.010	<0.100	0.020	0.030	0.04	0.38	0.40	0.040	--	<0.010

## RED RIVER BASIN

07311200 BLUE BEAVER CREEK NEAR CACHE, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)
NOV 25...	0.020	0.06	300	<1	48	<0.5	<1	<1	<3	12	110
FEB 27...	<0.010	--	<10	<1	57	<0.5	<1	3	<3	4	32
MAY 20...	<0.010	--	400	<1	400	<0.5	<1	<1	<3	3	260
SEP 30...	<0.010	--	--	--	--	--	--	--	--	--	--
DATE	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 25...	3	<4	13	0.3	<10	3	<1	<1	52	<6	14
FEB 27...	6	<4	11	--	<10	<2	<1	<1	80	<6	10
MAY 20...	<1	<4	13	<0.1	<10	2	<1	<1	44	<6	290
SEP 30...	--	--	--	--	--	--	--	--	--	--	--
DATE	GROSS ALPHA, DIS- SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DIS- SOLVED (PCI/L AS SR/ YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/ YT-90)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L)	URANIUM DIS- SOLVED, EXTRAC- TION (UG/L)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 25...	<0.7	<0.7	1.3	1.4	1.1	1.4	0.04	<0.13	6	0.19	85
FEB 27...	--	--	--	--	--	--	--	--	7	0.03	66
MAY 20...	--	--	--	--	--	--	--	--	23	3.6	79
SEP 30...	--	--	--	--	--	--	--	--	26	0.13	53

## 07311500 DEEP RED RUN NEAR RANDLETT, OK

LOCATION.--Lat 34°13'15", long 98°27'10", in SW 1/4 SW 1/4 sec.10, T.4 S., R.12 W., Cotton County, Hydrologic Unit 11130203, near right bank on downstream side of pier of bridge on U.S. Highway 277, 2.8 mi north of Randlett, and at mile 4.8.

DRAINAGE AREA.--617 mi<sup>2</sup>.

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

REVISED RECORDS.--WSP 1211: Drainage area. WSP 1631: 1956. WSP 1920: 1951.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 924.49 ft Oklahoma State Highway Department datum. Prior to Nov. 10, 1949, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Nov. 11-14, Dec. 4 to Jan. 21, June 28 to July 2, 4-21, July 26 to Aug. 31, and Sept. 25-28. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--37 years, 128 ft<sup>3</sup>/s, 92,740 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 72,300 ft<sup>3</sup>/s, Oct. 20, 1983, gage height, 28.89 ft, from rating curve extended above 13,000 ft<sup>3</sup>/s on basis of contracted-opening measurement at 27.51 ft, in 1969; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1908 reached a stage somewhat exceeding 27 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft<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. 1	1945	3,500	20.71	Sept. 3	0615	2,860	19.25
Oct. 19	0915	*18,100	*25.47	Sept. 6	0800	5,990	23.38
May 26	2215	3,160	19.99	Sept. 15	0100	2,180	17.16
June 18	0145	2,480	18.17				

Minimum daily discharge, 1.5 ft<sup>3</sup>/s, Aug. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2940	201	34	11	8.6	9.7	5.9	71	134	15	1.8	101
2	1620	140	32	12	9.4	9.0	7.3	16	101	17	1.7	1830
3	95	85	30	14	11	8.9	21	10	93	36	1.6	2510
4	53	75	29	12	11	9.2	21	7.3	98	20	1.6	1440
5	33	71	27	11	12	13	10	5.1	205	10	1.5	3240
6	22	63	26	10	14	14	8.6	4.1	234	8.0	1.9	5610
7	15	80	24	9.4	17	14	7.4	4.0	94	7.0	5.0	4020
8	13	59	22	8.8	19	13	6.2	3.8	58	6.0	3.4	1740
9	11	42	21	8.5	19	11	5.7	532	41	5.4	2.5	595
10	12	32	20	8.2	20	9.4	6.0	1030	56	5.0	3.0	185
11	623	27	21	8.0	19	8.6	5.9	711	57	4.5	75	143
12	930	25	25	7.8	17	42	5.8	130	34	5.0	50	105
13	186	23	20	8.3	15	78	5.4	61	26	4.3	23	88
14	293	22	18	9.0	14	33	5.2	40	23	4.0	5.0	962
15	1090	65	17	17	14	17	4.9	32	439	3.8	3.5	1730
16	1600	685	16	13	14	14	4.4	27	1720	3.7	3.2	751
17	515	659	15	11	17	19	4.0	320	2200	3.6	3.0	346
18	4820	175	14	10	21	119	4.0	1040	2360	3.5	2.7	742
19	14800	124	13	9.6	19	71	6.5	1020	1580	3.4	2.5	520
20	6610	100	12	12	17	39	5.5	520	284	3.3	2.3	344
21	3920	89	12	11	15	24	6.1	193	201	6.0	2.2	191
22	1710	78	11	10	14	17	6.9	112	136	24	2.0	127
23	934	70	10	9.6	13	14	5.8	81	91	54	1.8	93
24	782	62	12	9.8	12	11	5.4	65	70	44	1.7	77
25	540	68	11	12	13	9.0	5.1	407	75	28	2.0	59
26	355	75	10	9.7	13	8.2	4.4	2540	119	8.5	4.5	47
27	257	76	9.6	9.4	13	7.6	4.9	2910	62	3.5	11	37
28	203	63	10	9.1	11	7.2	35	2700	25	2.5	28	31
29	177	44	11	8.5	---	7.5	55	1210	20	2.0	9.0	26
30	182	37	14	8.4	---	7.2	99	340	17	1.9	10	275
31	217	---	12	8.6	---	6.9	---	192	---	1.8	25	---
TOTAL	45558	3415	558.6	316.7	412.0	671.4	378.3	16334.3	10653	344.7	291.4	27965
MEAN	1470	114	18.0	10.2	14.7	21.7	12.6	527	355	11.1	9.40	932
MAX	14800	685	34	17	21	119	99	2910	2360	54	75	5610
MIN	11	22	9.6	7.8	8.6	6.9	4.0	3.8	17	1.8	1.5	26
AC-FT	90360	6770	1110	628	817	1330	750	32400	21130	684	578	55470

CAL YR 1985 TOTAL 166661.5 MEAN 457 MAX 14800 MIN 1.3 AC-FT 330600  
WTR YR 1986 TOTAL 106898.0 MEAN 293 MAX 14800 MIN 1.5 AC-FT 212000

## RED RIVER BASIN

07313400 WAURIKA LAKE NEAR WAURIKA, OK

LOCATION.--Lat 34°13'57", long 98°02'51", in SW 1/4 SW 1/4 sec.4, T.4 S., R.8 W., Jefferson County, Hydrologic Unit 11130208, 3,050 ft east of outlet works on Beaver Creek, 5.5 mi north of Waurika and at mile 27.0.

DRAINAGE AREA.--562 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929. Prior to Aug. 26, 1977, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by an earth dam with a concrete outlet structure and emergency spillway. Storage began Aug. 1, 1977. Capacity 469,300 acre-ft at elevation 970.0 ft, crest of uncontrolled spillway and 203,100 acre-ft at elevation 951.4 ft, top of conservation pool. Dead storage, 3,400 acre-ft below elevation 910.0 ft. Reservoir is used for flood control, irrigation, water supply, water quality, fish and wildlife, and recreation.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 331,900 acre-ft, Oct. 23, 1983, elevation, 961.72 ft; minimum since first major filling, 59,170 acre-ft, Dec. 4-5, 1978, elevation, 931.56 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 216,300 acre-ft, Oct. 21, elevation, 952.63 ft; minimum, 186,800 acre-ft, Oct. 7, elevation, 949.82 ft.

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

949	178,800	956	255,300
951	198,900	959	293,800
953	220,400	962	335,900

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	188200	204600	205700	202700	203500	205700	204900	207200	204500	204000	194900	191400
2	188100	203900	205600	203000	203800	205800	204100	205700	204500	203900	194600	191400
3	188000	204100	205500	202900	204100	205800	205800	204300	206600	203500	194000	193300
4	188700	203600	205700	203200	204300	205100	206800	204000	208700	203100	193900	196600
5	187700	203400	205700	202600	204700	205100	206700	203600	210100	202500	194200	197900
6	187100	203500	205600	203100	205200	204200	206800	203600	210200	202300	194200	198300
7	186900	203100	205800	203100	205300	203800	206800	203300	209000	202200	194200	198400
8	187000	202700	205800	202700	205300	203200	206400	203300	207400	202000	194100	198100
9	187100	203100	206200	202700	205700	203200	204800	203700	206700	202000	194800	198000
10	188500	203300	207500	202700	206000	203200	203900	203900	205500	201500	194200	199500
11	188000	203000	206400	202700	205700	203100	203300	203900	207300	201300	194000	202400
12	188200	203100	206700	203100	205500	205000	203300	203900	207100	201000	193700	202500
13	189400	203300	206400	203100	204900	205500	203600	203800	206200	200600	193400	202500
14	191100	204500	205900	203100	205500	205200	203300	204000	206000	200600	193000	208700
15	191300	203700	206100	203100	205600	205100	203000	204000	205000	200100	193400	212200
16	191300	203900	206200	203100	205800	204500	202500	204500	205100	199700	193400	213600
17	193900	204100	206500	203300	206000	203600	202400	207100	206400	199400	193400	212500
18	201200	204800	205800	203400	206200	206200	202900	208400	206500	199100	193100	210500
19	212200	205100	206400	203400	205700	207400	205100	208800	206400	198900	192500	208200
20	215500	204700	206200	203400	207000	206400	204500	207700	206300	198600	192300	206800
21	216200	204700	206500	204500	205900	206400	204400	206500	206200	198500	192100	205300
22	215200	204800	206500	203400	205900	206400	204100	205300	206100	198100	191900	203900
23	213500	205800	206800	203400	205800	206400	204100	204900	205800	197800	191200	203100
24	211500	204900	207600	203300	206000	206400	204600	204800	205800	197500	191400	202700
25	210500	205000	205600	203400	205900	206300	204500	207300	205300	196800	191200	202500
26	210100	206400	205100	203500	207000	206600	204500	208600	205100	196700	191100	202900
27	210000	205100	204500	203300	207000	206700	205100	208800	205100	196600	192300	202400
28	209300	205000	203900	203300	205900	206700	205000	207200	204700	196200	191400	202300
29	208700	204800	203200	203500	---	205900	205000	205800	204300	195900	190700	202200
30	207000	206600	203100	203400	---	205200	205600	205000	204000	195500	190500	202500
31	204800	---	203100	203400	---	204600	---	204700	---	195300	190200	---
MAX	216200	206600	207600	204500	207000	207400	206800	208800	210200	204000	194900	213600
MIN	186900	202700	203100	202600	203500	203100	202400	203300	204000	195300	190200	191400
(+)	951.57	951.74	951.40	951.43	951.67	951.55	951.64	951.56	951.49	950.65	950.16	951.35
(++)	+15,500	+1,800	-3,500	+300	+2,500	-1,300	+1,000	-900	-700	-8,700	-5,100	+12,300
CAL YR 1985	MAX 270200	MIN 186200	(++)	-14,500								
WTR YR 1986	MAX 216200	MIN 186900	(++)	+13,200								

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET



## RED RIVER BASIN

235

## 07313500 BEAVER CREEK NEAR WAURIKA, OK

LOCATION.--Lat 34°13'00", long 98°02'57", on north line of NW 1/4 NW 1/4 sec.16, T.4 S., R.8 W., Jefferson County, Hydrologic Unit 11130208, on left bank on downstream side of bridge on State Highway 5, 4.5 mi northwest of Waurika, 6.2 mi upstream from Cow Creek, and at mile 25.8.

DRAINAGE AREA.--563 mi<sup>2</sup>.

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

REVISED RECORDS.--WSP 1731: 1954 (M).

GAGE.--Water-stage recorder. Datum of gage is 874.17 ft, Oklahoma State Highway Department datum. Prior to Apr. 5, 1966, water-stage recorder at same site at datum 5.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by Waurika Lake (07313400) 1.2 mi upstream beginning August 1977.

AVERAGE DISCHARGE.--Prior to regulation by Waurika Lake, 23 years (water years 1954-76), 107 ft<sup>3</sup>/s, 77,520 acre-ft/yr; since regulation by Waurika Lake, 9 years (water years 1978-86), 104 ft<sup>3</sup>/s, 75,550 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,200 ft<sup>3</sup>/s, May 20, 1955, gage height, 27.42 ft, present datum; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 18, 1951, reached a stage of 27.7 ft, present datum, from floodmark, discharge 65,300 ft<sup>3</sup>/s by contracted-opening measurement of peak flow. A similar stage was reached prior to 1889, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,080 ft<sup>3</sup>/s, Sept. 18, gage height, 16.22 ft; minimum daily discharge, 0.20 ft<sup>3</sup>/s, Oct. 4, 5, 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	487	1.7	31	.99	.95	333	.79	149	.62	.71	.93
2	4.2	43	1.0	30	.99	1.1	262	182	148	.54	.74	.75
3	.26	41	1.0	18	1.1	.96	263	363	156	.54	.78	1.4
4	.20	37	1.1	.79	.96	193	261	364	162	.56	.85	.97
5	.20	36	1.0	.75	1.4	384	261	256	99	.56	1.2	52
6	.23	18	1.1	.81	1.3	383	262	25	215	.56	1.6	.68
7	.20	.50	1.1	.81	.96	311	261	24	715	.66	1.0	.60
8	.22	.48	1.1	.77	.93	216	382	24	715	.72	1.1	.56
9	.25	.59	1.1	.81	.87	216	576	15	620	.74	1.0	.59
10	.44	.67	1.1	.78	.87	139	576	1.4	359	.84	1.4	.86
11	.42	.73	1.3	.74	.86	39	348	1.2	360	.91	.93	8.2
12	.43	.73	1.3	.74	.87	38	34	1.2	360	.93	.86	.50
13	.51	.77	1.3	.74	.87	37	34	1.2	359	1.1	.81	.46
14	.62	.79	1.3	.78	.87	229	34	1.4	359	1.2	.81	197
15	.52	.90	1.3	.81	.87	374	29	1.6	367	1.3	1.0	8.9
16	.49	.87	1.3	.84	.87	374	20	1.4	198	1.3	.86	288
17	.51	.87	1.2	.87	.91	258	.43	2.3	34	1.3	.78	891
18	.92	.91	1.2	.87	.93	.86	.30	1.5	33	1.3	.76	1070
19	.75	.93	1.2	.87	.91	.61	.26	111	32	1.3	.74	994
20	.51	.89	1.2	.87	.93	.69	.50	535	32	1.5	.73	803
21	101	.87	1.2	.87	.87	.47	.50	670	32	1.7	.71	803
22	598	.87	1.3	.87	.87	.44	.53	672	32	1.7	.70	716
23	1020	.87	1.3	.93	.89	.44	.56	451	32	.86	.68	343
24	1020	.87	194	.96	.93	.45	.60	30	32	.85	.66	115
25	941	.87	411	.93	.93	.43	.62	30	31	.87	.65	25
26	680	.91	408	.93	.93	.43	.63	28	31	.90	.67	25
27	680	.97	406	.93	.93	.55	.72	318	31	.95	.70	25
28	684	.94	404	.93	.93	101	.73	773	31	.92	.72	26
29	688	.93	402	.93	---	367	.68	774	31	.68	.68	18
30	688	1.2	290	.93	---	368	.68	524	16	.43	.68	.74
31	685	---	31	.93	---	369	---	149	---	.61	.69	---
TOTAL	7893.96	681.93	2573.7	102.79	26.54	4404.38	3943.74	6331.99	5771	28.95	26.20	6417.14
MEAN	255	22.7	83.0	3.32	.95	142	131	204	192	.93	.85	214
MAX	1020	487	411	31	1.4	384	576	774	715	1.7	1.6	1070
MIN	.20	.48	1.0	.74	.86	.43	.26	.79	16	.43	.65	.46
AC-FT	15660	1350	5100	204	53	8740	7820	12560	11450	57	52	12730

CAL YR 1985 TOTAL 161255.56 MEAN 442 MAX 2150 MIN .02 AC-FT 319900  
WTR YR 1986 TOTAL 38202.07 MEAN 105 MAX 1070 MIN .20 AC-FT 75770

## RED RIVER BASIN

07315500 RED RIVER NEAR TERRAL, OK

LOCATION.--Lat 33°52'43", long 97°56'03", Jefferson County, Hydrologic Unit 11130201, on left bank at downstream side of bridge abutment on U.S. Highway 81, 0.5 mi downstream from Chicago, Rock Island, and Railroad Co. bridge, 1.2 mi south of Terral, 3.6 mi downstream from Little Wichita River, and at mile 872.

DRAINAGE AREA.--28,723 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1938 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 770.31 ft, National Geodetic Vertical Datum of 1929. Prior to Jan. 12, 1939, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. There are many small diversions upstream for irrigation, oil field, and municipal uses.

AVERAGE DISCHARGE.--48 years (water years 1939-86), 2,169 ft<sup>3</sup>/s, 1,571,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 210,000 ft<sup>3</sup>/s, Oct. 22, 1983, gage height, 33.60 ft; minimum, 43 ft<sup>3</sup>/s, Mar. 15, 1939. Maximum stage since at least 1891, that of Oct. 22, 1983.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 19, 1935, reached a stage of 27.2 ft, although floods in 1891 and on May 1, 1908, are reported to have reached about the same stage.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 21,000 ft<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. 20	1300	*56,000	*20.13	Sept. 6	0900	37,200	18.52

Minimum discharge, 273 ft<sup>3</sup>/s, Aug. 8, 9, 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7570	2320	912	699	447	512	627	754	2270	1120	322	939
2	6140	1880	842	641	454	500	647	683	1890	953	314	7090
3	4210	1410	931	576	471	479	585	805	1910	891	294	13200
4	2030	1260	864	543	492	547	679	918	2320	1190	297	13600
5	1480	1240	874	518	514	627	1220	718	4430	2750	307	28100
6	1160	1150	795	505	561	868	1030	631	5350	2680	283	35200
7	948	1060	745	492	598	871	832	413	7320	1840	280	26400
8	804	991	728	474	800	810	714	354	4370	1410	273	19800
9	707	964	724	479	784	703	697	387	4000	1160	273	13300
10	665	899	709	505	775	704	863	683	3280	929	290	9290
11	625	860	695	508	788	671	838	934	4370	784	280	8610
12	5600	836	695	511	738	660	724	1770	7490	697	287	9760
13	7450	820	688	482	720	664	491	1700	8320	661	273	7490
14	4090	772	736	472	717	1840	442	1310	8550	891	307	6490
15	5720	754	763	464	714	1430	422	1040	8660	734	312	10300
16	9770	1050	740	460	726	1080	401	851	6420	639	324	9830
17	5160	2150	691	457	734	972	388	2060	7480	575	313	7140
18	8320	4190	655	451	738	1090	372	5700	8380	522	301	11600
19	32800	2870	627	442	759	1060	479	10700	7900	490	294	7830
20	51400	2040	622	443	778	1310	742	9320	5620	482	292	7290
21	26600	1920	622	434	793	913	876	6210	3020	457	347	5420
22	11500	1710	617	423	745	728	747	3440	2110	461	415	4890
23	7510	1350	622	423	658	630	659	2400	1700	490	370	4420
24	4970	1140	617	434	693	560	537	1850	1580	524	332	3860
25	4090	1040	630	446	646	517	440	1340	1420	645	312	3630
26	3740	985	861	430	594	499	386	3610	1280	735	303	3380
27	3560	949	865	447	557	480	360	7990	2030	753	331	3270
28	3180	896	840	442	530	448	355	12500	2290	539	328	3010
29	2700	845	831	438	---	424	337	8690	1790	478	304	2520
30	2620	840	837	421	---	624	500	5920	1340	396	399	1940
31	2520	---	887	443	---	652	---	3320	---	344	387	---
TOTAL	229639	41191	23265	14903	18524	23873	18390	99001	128890	27220	9743	289599
MEAN	7408	1373	750	481	662	770	613	3194	4297	878	314	9653
MAX	51400	4180	931	699	800	1840	1220	12500	8660	2750	415	35200
MIN	625	754	617	421	447	424	337	354	1280	344	273	939
AC-FT	455500	81700	46150	29560	36740	47350	36480	196400	255700	53990	19330	574400

CAL YR 1985 TOTAL 1528028 MEAN 4186 MAX 59500 MIN 294 AC-FT 3031000  
WTR YR 1986 TOTAL 924249 MEAN 2532 MAX 51400 MIN 273 AC-FT 1833000

## RED RIVER BASIN

237

07315500 RED RIVER NEAR TERRAL, OK--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.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 13,000 microsiemens, June 15, 1984; minimum daily, 255 microsiemens, Jan. 1.

WATER TEMPERATURES: Maximum daily, 35.0 °C, Aug. 13, 16, 17, 1983; minimum daily, 0.0 °C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 9,580 microsiemens, Feb. 21; minimum daily, 760 microsiemens, Oct. 20.

WATER TEMPERATURES: Maximum daily, 29.0 °C on several days during June, July, and August; minimum daily, 1.0 °C, Dec. 2, Feb. 2, 4.

## WATER QUALITY DATA, WATER YEAR\* OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
OCT									
20...	1115	54200	790	--	19.5	160	75	48	9.4
NOV									
12...	1100	846	5890	--	13.0	960	770	260	75
FEB									
28...	0845	530	8530	--	10.0	1300	1100	310	120
MAY									
05...	1440	721	2870	7.80	23.0	510	370	130	45
19...	1200	10100	1850	7.50	18.0	340	250	100	23
SEP									
03...	1445	11500	4150	7.60	--	560	490	170	34

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WH WAT TOTAL FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)
OCT									
20...	90	3	3.7	84	87	130	0.3	9.2	430
NOV									
12...	940	14	8.2	189	720	1500	0.4	10	3600
FEB									
28...	1700	21	9.1	187	1100	2400	0.5	4.0	5800
MAY									
05...	390	8	6.3	140	320	670	0.4	4.6	1700
19...	230	6	6.7	90	280	350	0.3	8.7	1100
SEP									
03...	620	12	8.0	75	520	990	0.4	8.5	2400

## RED RIVER BASIN

07315500 RED RIVER NEAR TERRAL, OK--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1985 TO SEPTEMBER 1986

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (US/CM)	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)	HARDNES (CA,MG) (MG/L)
OCT. 1985	229639	1710	1030	638000	360	220300	220	134400	340
NOV. 1985	41191	4040	2460	274000	910	101100	510	56300	750
DEC. 1985	23265	5320	3280	206000	1300	79200	660	41600	950
JAN. 1986	14903	6430	3990	161000	1600	63600	800	32000	1100
FEB. 1986	18524	6540	4090	205000	1700	83300	810	40300	1100
MAR. 1986	23873	4410	2700	174000	1000	65800	550	35400	800
APR. 1986	18390	4170	2550	126000	940	46700	520	25900	770
MAY 1986	99001	1640	980	262000	330	88300	210	55700	330
JUNE 1986	128900	2030	1210	422000	420	144800	260	89200	400
JULY 1986	27220	4490	2740	201000	1000	74900	560	41200	830
AUG. 1986	9744	5530	3410	89800	1300	34700	690	18100	980
SEPT 1986	289599	2110	1270	990000	440	341000	270	208600	410
TOTAL	924249	**	**	3749000	**	1344000	**	779000	**
WTD.AVG.	2532	2480	1500	**	540	**	310	**	470

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
EQUIVALENT MEAN

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2190	2850	3500	6000	5970	8510	3900	4670	2340	4040	5010	4630
2	1550	2970	4120	5800	5860	8500	3840	4380	2110	4140	5040	4700
3	1500	3760	4330	5970	5570	8300	4050	3890	2070	4240	4860	4150
4	2190	4360	5230	6240	4640	8200	4280	3020	1750	4570	5100	2700
5	2850	4650	3200	6350	4060	6870	3460	2840	1030	5160	4860	1930
6	3260	4970	3150	6480	4770	4760	2990	2800	1340	4750	5170	1130
7	3770	5290	5040	6530	3510	4380	3010	3810	2620	3300	5360	1090
8	4140	5460	5170	6880	2590	4190	3320	4860	3500	3220	5140	1080
9	4200	5710	5790	6370	3300	4600	3750	5140	2840	3400	4960	1600
10	4110	5820	4040	6720	4070	4580	3160	3560	2480	5110	4880	2160
11	4270	6020	4520	6710	4730	4500	3330	3790	1610	4680	4840	2120
12	4560	5900	4730	6570	4870	4790	3320	2110	1790	4550	4970	1770
13	5560	6020	5560	6650	5250	4380	5560	1950	1160	4780	4540	1970
14	4480	6050	6080	6460	5460	3440	6170	2650	1800	6380	4920	2260
15	4090	6040	5800	6480	6030	2210	6440	3380	1500	5420	5300	1700
16	2440	4990	5940	6490	6140	2720	6260	2560	1370	4100	4770	1380
17	1560	2760	5880	6540	7620	3120	6200	1330	1440	4240	4690	1760
18	1350	3070	6080	6510	8140	3240	6110	1050	1450	4510	4880	1750
19	1080	3100	6300	6310	8260	3470	5000	910	1520	4730	5080	2530
20	760	3040	6570	6380	8350	2480	3330	1000	1560	4970	5110	2740
21	790	2800	7050	6410	9580	2600	3260	1160	1530	5020	5160	2600
22	810	2570	6990	6450	9480	3990	4390	1650	2110	5050	5840	2460
23	1060	3040	7120	6510	9400	4730	4040	2030	2460	4660	8620	2650
24	1530	4000	7010	6500	9370	5910	4270	2250	4160	4740	7380	3150
25	1960	4670	7400	6410	9500	5840	4820	3260	5450	5040	6580	3700
26	2290	4900	5520	6340	8750	5970	5330	2660	4660	5430	6640	4220
27	2620	5070	5410	6360	8700	5740	5280	1850	4880	3770	6940	4510
28	2860	5140	5240	6580	8530	5990	5380	820	4300	3330	6880	4650
29	3100	5380	5020	6620	---	6100	5620	1390	4670	3320	5970	4730
30	3270	5640	5120	6650	---	4600	5290	1820	4070	4600	5420	4810
31	3790	---	5290	6560	---	3960	---	2200	---	5100	5210	---
MEAN	2710	4530	5430	6450	6520	4920	4510	2610	2520	4530	5490	2750
WTR YR 1986	MEAN	4410		MAX	9580		MIN	760				

## RED RIVER BASIN

239

07315500 RED RIVER NEAR TERRAL, OK--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.0	15.0	4.0	7.0	14.0	10.0	19.0	22.0	20.0	27.0	29.0	21.0
2	14.0	13.0	1.0	7.0	---	11.0	18.0	20.0	22.0	28.0	28.0	22.0
3	16.0	13.0	3.0	7.0	11.0	13.0	17.0	21.0	24.0	28.5	26.0	24.0
4	17.0	14.0	9.0	6.0	16.0	15.0	18.0	22.0	28.0	27.0	24.0	23.0
5	16.0	15.0	8.0	4.0	12.0	13.0	19.0	22.0	23.0	25.0	26.0	23.0
6	17.0	14.0	9.0	4.0	10.0	13.0	20.0	23.0	25.0	---	26.0	24.0
7	16.0	13.0	9.0	4.0	8.0	12.0	22.0	22.0	25.0	26.0	25.0	22.0
8	22.0	13.0	10.0	3.0	5.0	11.0	18.0	22.0	25.0	27.0	26.0	22.0
9	23.0	17.0	12.0	3.0	---	16.0	16.0	21.0	26.0	27.0	26.0	23.0
10	20.0	16.0	9.0	3.0	---	12.0	16.0	20.0	25.0	27.0	29.0	24.0
11	17.0	11.0	4.0	4.0	3.0	14.0	17.0	21.0	25.0	26.0	27.0	24.0
12	20.0	13.0	3.0	6.0	3.0	13.0	17.0	24.0	25.0	26.0	27.0	24.0
13	20.0	19.0	---	6.0	3.0	14.0	18.0	23.0	25.0	26.0	26.0	25.0
14	21.0	18.0	3.0	7.0	6.0	15.0	16.0	24.0	26.0	29.0	26.0	25.0
15	18.0	14.0	4.0	7.0	7.0	14.0	16.0	23.0	24.0	26.0	28.0	25.0
16	22.0	12.0	5.0	11.0	11.0	14.0	16.0	23.0	25.0	26.0	29.0	24.0
17	19.0	14.0	6.0	7.0	12.0	15.0	---	21.0	24.0	25.0	28.0	25.0
18	20.0	16.0	4.0	12.0	13.0	15.0	19.0	21.0	25.0	26.0	28.0	25.0
19	19.0	16.0	3.0	11.0	15.0	13.0	16.0	17.0	25.0	---	27.0	25.0
20	19.0	10.0	4.0	9.0	14.0	11.0	14.0	18.0	26.0	---	28.0	25.0
21	19.0	9.0	5.0	11.0	6.0	12.0	17.0	20.0	27.0	29.0	28.0	---
22	20.0	9.0	6.0	8.0	8.0	12.0	14.0	21.0	28.0	24.0	26.0	26.0
23	20.0	11.0	6.0	7.0	---	13.0	17.0	25.0	27.0	28.0	27.0	26.0
24	20.0	10.0	5.0	10.0	13.0	15.0	19.0	24.0	29.0	27.0	25.0	26.0
25	21.0	12.0	5.0	9.0	12.0	15.0	21.0	26.0	28.0	26.0	26.0	26.0
26	20.0	15.0	5.0	7.0	16.0	16.0	23.0	25.0	28.0	27.0	27.0	26.0
27	21.0	11.0	6.0	4.0	15.0	17.0	21.0	21.0	28.0	28.0	26.0	25.0
28	20.0	7.0	6.0	8.0	10.0	17.0	21.0	20.0	28.0	26.0	23.0	---
29	17.0	7.0	6.0	10.0	---	16.0	21.0	21.0	28.0	29.0	22.0	24.0
30	15.0	10.0	7.0	8.0	---	18.0	24.0	23.0	28.0	28.0	21.0	25.0
31	14.0	---	7.0	12.0	---	18.0	---	22.0	---	28.0	21.0	---
MEAN	18.5	13.0	6.0	7.0	10.0	14.0	18.5	22.0	25.5	27.0	26.0	24.5
WTR YR 1986	MEAN	17.5		MAX	29.0		MIN	1.0				

## RED RIVER BASIN

07315700 MUD CREEK NEAR COURTNEY, OK

LOCATION.--Lat 34°00'20", long 97°34'00", in NW 1/4 SE 1/4 sec.25, T.6 S., R.4 W., Jefferson County, Hydrologic Unit, 11130201, on downstream side of bridge on State Highway 89, 4.0 mi downstream from North Mud Creek, 6.0 mi northwest of Courtney, and at mile 11.5.

DRAINAGE AREA.--572 mi<sup>2</sup>.

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

REVISED RECORDS.--WDR OK-78-2: Maximum gage height.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 727.72 ft, National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1968, auxiliary water-stage recorder 2.0 mi downstream from base gage.

REMARKS.--Estimated daily discharges: Oct. 26 to Dec. 2, and June 29 to July 6. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--26 years, 141 ft<sup>3</sup>/s, 102,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,400 ft<sup>3</sup>/s, May 1, 1974, gage height, 31.37 ft; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 1957, reached a stage of 30.6 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft<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. 20	1030	6,130	26.42	Sept. 6	1845	2,550	23.00
June 5	1145	*6,980	*26.77	Sept. 16	1645	4,390	25.56
June 18	0845	2,500	23.46				

No flow Aug. 21-31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	19	250	16	11	12	14	17	149	25	.58	.11
2	42	16	170	16	11	12	14	17	99	20	.69	.09
3	18	15	120	16	12	12	20	38	166	17	.69	.07
4	8.5	14	64	16	13	11	40	62	2890	16	.56	.35
5	4.2	13	39	15	14	11	94	28	6670	14	.42	634
6	2.5	12	29	15	19	10	102	19	4650	12	.35	1990
7	1.3	12	24	14	27	11	51	15	3080	11	.33	1880
8	2.5	12	22	14	28	11	34	13	1470	11	.58	405
9	2.5	12	20	14	32	11	26	15	147	10	.57	58
10	2.3	12	19	13	28	11	22	20	95	9.1	.70	32
11	2.5	12	20	14	23	12	20	78	322	8.3	.61	20
12	2.8	13	23	14	20	14	18	70	369	7.6	.15	95
13	2.0	14	23	13	18	60	17	38	162	6.8	.11	165
14	5.6	19	23	12	16	106	17	26	79	6.2	.09	59
15	9.9	24	22	14	15	54	17	54	63	5.9	.09	674
16	24	21	21	15	16	34	16	113	69	5.3	.10	2890
17	34	19	19	15	17	37	14	166	1290	4.8	.13	3400
18	930	17	18	15	17	63	12	413	2270	4.2	.09	1260
19	3530	15	19	15	17	54	148	441	1360	3.6	.04	95
20	5210	13	19	15	16	33	683	231	231	3.3	.02	61
21	3590	12	19	15	15	27	215	92	134	2.8	.00	42
22	1880	11	18	15	14	23	102	55	85	2.4	.00	33
23	135	11	17	14	14	19	54	34	63	2.2	.00	27
24	78	10	17	13	13	16	31	27	51	1.9	.00	23
25	56	10	17	12	13	15	23	23	51	1.7	.00	19
26	42	11	17	12	13	15	20	233	43	1.4	.00	16
27	38	12	17	11	12	15	18	366	45	1.3	.00	14
28	29	15	17	10	12	14	16	111	39	1.2	.00	12
29	25	100	16	11	---	14	15	68	35	.98	.00	12
30	22	201	16	12	---	14	14	48	30	.86	.00	13
31	21	---	16	11	---	14	---	34	---	.73	.00	---
TOTAL	15792.6	697	1151	427	476	765	1887	2965	26207	218.57	6.90	13929.62
MEAN	509	23.2	37.1	13.8	17.0	24.7	62.9	95.6	874	7.05	.22	464
MAX	5210	201	250	16	32	106	683	441	6670	25	.70	3400
MIN	1.3	10	16	10	11	10	12	13	30	.73	.00	.07
AC-FT	31320	1380	2280	847	944	1520	3740	5880	51980	434	14	27630

CAL YR 1985 TOTAL 161669.50 MEAN 443 MAX 10600 MIN .00 AC-FT 320700  
WTR YR 1986 TOTAL 64522.52 MEAN 177 MAX 6670 MIN .00 AC-FT 128000



## 07316000 RED RIVER NEAR GAINESVILLE, TX

LOCATION.--Lat 33°43'40", long 97°09'35", in SW 1/4 sec.36, T.9 S., R.1 E., Love County, OK, Hydrologic Unit 11130201, on downstream right bank near end of bridge on Interstate 35, 0.2 mi downstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 5.0 mi downstream from Fish Creek, 4.5 mi southwest of Thackerville, OK, 7.0 mi north of Gainesville, and at mile 791.5.

DRAINAGE AREA.--30,782 mi<sup>2</sup> of which 5,936 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1936 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 627.91 ft, National Geodetic Vertical Datum of 1929. Prior to Jan. 17, 1939, and Feb. 13, 1965 to Nov. 14, 1966, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 1-2, 17-20, Nov. 28, Dec. 10-29, Jan. 7, Feb. 2-7, June 4-8, 10-17, June 20 to July 23, Aug. 15-17, Sept. 14, 16-30. Records poor. Flow slightly regulated by Lake Kemp (station 07312000 in Texas), since 1943 by Lake Altus (station 07302500 in Oklahoma), since 1946 by Lake Kickapoo (station 07314000 in Texas), since 1967 by Lake Arrowhead (station 07314800 in Texas) and Moss Lake (station 07315950 in Texas).

COOPERATION.--Gage-height record and 6 discharge measurements furnished by U.S. Army Corps of Engineers, records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--50 years, 2,802 ft<sup>3</sup>/s, 2,030,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 168,000 ft<sup>3</sup>/s, June 9, 1941, gage height, 24.15 ft, maximum gage height, 37.14 ft, Oct. 24, 1983; minimum discharge, 48 ft<sup>3</sup>/s, Jan. 27, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 24,000 ft<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. 21	1500	*60,400	*21.26	Sept. 7	2400	42,500	18.81

Minimum daily discharge, 288 ft<sup>3</sup>/s, Aug. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3650	3390	912	1060	513	557	463	844	9220	2690	499	336
2	4700	3250	963	1120	550	541	671	1280	5890	2530	478	513
3	7200	2770	1490	1020	590	517	1200	1280	4330	2400	468	2310
4	6460	2160	1220	898	630	494	1440	1070	4020	2330	410	16400
5	3870	1670	1090	816	670	469	977	1010	8360	2200	405	21500
6	2650	1470	912	729	710	456	859	1240	25300	2150	400	36200
7	1860	1300	884	706	747	512	1330	1070	16300	2500	359	40200
8	1400	1200	797	679	753	713	1490	944	14900	2300	350	31200
9	1030	1120	748	652	753	853	1150	778	12000	2050	350	20400
10	780	1040	729	639	867	916	954	720	8360	1820	394	14900
11	689	993	723	639	973	832	862	892	7270	1610	439	11900
12	644	948	723	626	986	801	1010	1680	8630	1430	504	11000
13	1360	912	723	639	981	922	1050	1960	12000	1280	463	12700
14	9430	870	723	620	953	824	982	2360	12900	1220	389	12500
15	6140	823	723	620	903	817	669	2560	14300	1170	379	10500
16	5870	810	725	606	872	1500	498	2250	12400	1090	369	11700
17	8530	803	740	606	870	1710	467	1880	14300	1010	364	18700
18	8820	877	800	606	862	1370	453	2190	16700	960	350	14900
19	14800	2350	760	595	849	1290	2000	5280	11400	915	336	15700
20	41000	4330	720	591	866	1390	6650	14200	14900	875	328	12900
21	56600	2900	710	583	877	1260	4640	12900	9700	825	309	11400
22	35600	2330	710	560	888	1510	2880	9810	6400	760	301	9020
23	14700	2150	700	554	928	1180	2000	6810	4000	830	288	8000
24	9840	1830	700	544	924	922	1400	4860	2950	639	345	7300
25	7210	1430	700	537	830	733	1120	6740	2700	645	434	6500
26	5930	1240	695	521	736	638	954	3740	2600	660	390	6000
27	5270	1480	695	510	663	572	759	3310	2480	796	333	5800
28	4650	1220	740	515	596	528	629	9730	2350	958	340	5700
29	4350	1000	850	526	---	491	526	17200	2630	948	313	5300
30	3800	897	941	515	---	446	564	13900	2850	778	318	4880
31	3370	---	1100	506	---	416	---	11100	---	578	328	---
TOTAL	282203	49563	25646	20338	22340	26180	40647	145588	272140	42947	11733	386359
MEAN	9103	1652	827	656	798	845	1355	4696	9071	1385	378	12880
MAX	56600	4330	1490	1120	986	1710	6650	17200	25300	2690	504	40200
MIN	644	803	695	506	513	416	453	720	2350	578	288	336
AC-FT	559700	98310	50870	40340	44310	51930	80620	288800	539800	85190	23270	766300
CAL YR 1985	TOTAL	2195171		MEAN	6014	MAX	73700	MIN	644	AC-FT	4354000	
WTR YR 1986	TOTAL	1325684		MEAN	3632	MAX	56600	MIN	288	AC-FT	2629000	

## RED RIVER BASIN

07316000 RED RIVER NEAR GAINESVILLE, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: May 1944 to April 1946, October 1952 to September 1964, October 1966 to current year. Chemical and biochemical analyses: January 1968 to September 1986. Pesticide analyses: April 1968 to September 1982. Sediment analyses: January 1978 to September 1986.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 1944 to April 1946, October 1952 to September 1964, October 1966 to current year.  
WATER TEMPERATURES: October 1952 to September 1963, October 1966 to current year.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District office upon request.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 11,100 microsiemens, July 16, 1972, June 19, 1984; minimum daily, 176 microsiemens, Nov. 4, 1958.

WATER TEMPERATURES: Maximum daily, 35.0 °C on several days during summer months; minimum daily, 0.0 °C on many days during winter months.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 8,390 microsiemens, Feb. 25; minimum daily, 653 microsiemens, June 7.  
WATER TEMPERATURES: Maximum daily, 35.0 °C, Aug. 7, 11, 18; minimum daily, 2.0 °C, Dec. 14, 15.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS./ 100 ML)	HARD- NESS (MG/L AS CACO3)	
DEC 03...	1630	1310	4700	8.00	3.5	140	13.1	103	1.4	K700	870	830	
JAN 14...	1700	627	5700	8.50	8.5	4.5	13.8	122	3.0	K3	K3	1000	
APR 14...	1830	990	3350	8.50	20.5	40	11.4	130	5.4	K19	K44	620	
JUN 03...	1735	4350	1920	7.80	24.5	430	7.6	93	1.6	2400	1900	350	
JUL 22...	1545	720	4170	8.20	30.5	--	7.8	107	3.3	--	K12	770	
SEP 09...	1500	20400	940	7.70	24.0	680	6.6	80	2.0	K4200	K2200	170	
DATE		HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY WH WAT TOTAL FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
DEC 03...	620	220	68	710	11	6.8	214	560	1200	0.40	10	2890	
JAN 14...	790	260	87	910	13	7.1	222	730	1500	0.40	4.8	3670	
APR 14...	460	150	60	470	8	6.3	164	390	690	0.40	1.5	1940	
JUN 03...	240	100	24	250	6	7.1	107	250	400	0.30	8.8	1150	
JUL 22...	620	200	64	610	10	9.3	148	490	1000	0.40	8.4	2600	
SEP 09...	93	50	11	120	4	5.5	77	99	190	0.30	10	552	



## RED RIVER BASIN

07316000 RED RIVER NEAR GAINESVILLE, TX--Continued

SPECIFIC CONDUCTANCE, MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
EQUIVALENT MEAN

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7440	3040	4610	4740	5800	7980	5190	3080	1240	4230	3560	5990
2	5090	2970	4340	4710	5810	7900	5600	3120	1410	4140	3440	6160
3	2130	3430	3690	4790	5250	7610	4670	3600	1540	3870	3260	4660
4	1730	3610	3710	4760	4620	7690	2410	3610	1710	3630	4160	3390
5	1690	3800	3840	4900	4500	7540	2750	3520	1080	3800	4040	2720
6	1650	3970	4640	5160	3690	7360	2960	3120	857	3840	3780	1620
7	2610	3940	4570	5100	4510	7000	2490	3270	653	2990	3460	1070
8	2890	4170	5020	5270	4790	7030	2410	3240	983	3740	2720	970
9	3140	4320	4740	5390	4910	6680	2750	3340	2650	3850	2490	968
10	3380	4490	4470	5620	4950	4460	3170	3600	3180	3310	2360	1180
11	3780	4670	4620	5690	5170	4190	3120	3530	3580	3280	4580	1740
12	3800	4690	4890	5770	5010	3990	3270	3400	2150	3290	4720	2000
13	3860	4670	5030	5880	4630	4050	3490	3380	1560	3700	4910	1750
14	5520	5020	5110	5700	4210	4010	3350	3360	1300	4660	4960	1660
15	5160	5050	5300	5660	4330	4070	3320	3440	1020	4460	4090	1980
16	4450	5100	5440	5840	4360	3510	3120	3210	2260	4470	4600	2120
17	3860	5120	5420	5620	4750	3120	3570	3080	1010	4850	4840	1150
18	2170	5140	5370	5720	4890	2170	4750	3120	985	5040	4420	1020
19	1140	4540	5190	5560	5340	2560	3430	2240	1030	5280	4880	1340
20	806	3530	5130	5760	5740	2800	1400	920	1340	4150	5190	2010
21	760	3600	5220	5690	6840	3120	1310	890	1350	3970	4810	2510
22	740	3350	5250	5850	7260	3270	1590	2400	1380	4120	4740	2560
23	746	3100	5440	5860	7470	2720	1730	2260	1310	4300	4630	2390
24	891	2760	5780	5670	7790	2750	2390	1640	1770	4360	4800	2480
25	1120	2590	6040	5650	8390	3270	2910	1240	1820	4760	5150	2580
26	1520	2870	6020	5660	8230	3670	3150	2950	2670	4830	5290	2940
27	1770	2560	6130	5060	8150	4170	3010	3000	2930	4860	5760	3450
28	2170	3490	6180	5790	8050	4860	3050	1040	4870	4740	7150	3920
29	2360	3890	6510	5800	---	5220	3310	906	4320	5250	7310	4360
30	2640	4290	4950	5820	---	5330	3410	1310	4480	4510	6580	4450
31	2830	---	4770	5740	---	5320	---	1280	---	3590	6390	---
MEAN	2700	3930	5080	5490	5690	4820	3100	2650	1950	4190	4620	2570
WTR YR 1986		MEAN	3900	MAX	8390	MIN	653					

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.0	15.0	5.0	8.0	15.0	---	20.0	20.0	23.0	30.0	33.0	23.0
2	16.0	14.0	3.0	8.0	16.0	13.0	21.0	22.0	26.0	30.0	28.0	26.0
3	18.0	---	5.0	6.0	17.0	17.0	20.0	21.0	26.0	28.0	30.0	27.0
4	16.0	15.0	7.0	7.0	18.0	17.0	22.0	22.0	27.0	28.0	31.0	25.0
5	16.0	---	8.0	6.0	12.0	17.0	23.0	22.0	26.0	29.0	34.0	24.0
6	15.0	16.0	9.0	7.0	10.0	18.0	22.0	26.0	21.0	27.0	34.0	24.0
7	20.0	15.0	8.0	5.0	9.0	17.0	26.0	23.0	27.0	30.0	35.0	---
8	20.0	15.0	8.0	4.0	---	18.5	23.0	25.0	28.0	32.0	30.0	24.0
9	22.0	15.0	14.0	5.0	4.0	20.0	19.0	22.0	29.0	33.0	29.0	25.0
10	20.0	15.0	10.0	8.0	3.0	20.0	17.0	21.0	30.0	31.0	27.0	26.0
11	21.0	11.0	6.0	6.0	4.0	18.0	17.0	---	29.0	29.0	35.0	26.0
12	---	---	4.0	6.0	4.0	19.0	19.0	27.0	30.0	28.0	32.0	24.0
13	22.0	19.0	3.0	9.0	4.0	19.0	19.0	28.0	29.0	28.0	33.0	25.0
14	21.0	20.0	2.0	9.0	9.0	20.0	19.0	26.0	28.0	30.0	29.0	24.0
15	20.0	12.0	2.0	10.0	9.0	19.0	19.0	27.0	27.0	31.0	30.0	27.0
16	20.0	11.0	5.0	11.0	10.0	17.0	21.0	27.0	26.0	30.0	33.0	26.0
17	20.0	12.0	6.0	14.0	13.0	17.0	19.0	27.0	27.0	30.0	32.0	27.0
18	20.0	19.0	5.0	15.0	17.0	19.0	18.0	19.0	28.0	29.0	35.0	26.0
19	20.0	16.0	5.0	10.0	18.0	16.0	---	23.0	28.0	30.0	33.0	27.0
20	20.0	12.0	4.0	12.0	15.0	14.0	17.0	23.0	29.0	30.0	34.0	28.0
21	19.0	9.0	6.0	12.0	11.0	15.0	19.0	24.0	28.0	29.0	31.0	27.0
22	20.0	10.0	5.0	11.0	9.0	16.0	19.0	25.0	29.0	28.0	29.0	28.0
23	21.0	11.0	9.0	10.0	10.0	18.0	20.0	27.0	33.0	30.0	28.0	29.0
24	22.0	10.0	9.0	10.0	16.0	19.0	20.0	24.0	31.0	33.0	29.0	28.0
25	22.0	10.0	7.0	9.0	16.0	19.0	24.0	22.0	33.0	33.0	31.0	26.0
26	22.0	10.0	7.0	7.0	19.0	20.0	22.0	27.0	33.0	31.0	30.0	26.0
27	20.0	---	7.0	7.0	15.0	22.0	22.0	25.0	29.0	30.0	28.0	27.0
28	19.0	7.0	6.0	9.0	13.0	24.0	23.0	25.0	33.0	34.0	29.0	27.0
29	17.0	9.0	5.0	10.0	---	21.0	24.0	25.0	30.0	34.0	28.0	28.0
30	16.0	8.0	8.0	11.0	---	23.0	22.0	25.0	32.0	34.0	27.0	27.0
31	15.0	---	---	15.0	---	23.0	---	24.0	---	34.0	24.0	---
MEAN	19.5	13.0	6.5	9.0	11.5	18.5	20.5	24.0	28.5	30.5	30.5	26.0
WTR YR 1986		MEAN	20.0	MAX	35.0	MIN	2.0					

## 07316500 WASHITA RIVER NEAR CHEYENNE, OK

LOCATION.--Lat 35°37'35", long 99°40'05", in SE 1/4 sec.5, T.13 N., R.23 W., Roger Mills County, Hydrologic Unit 11130301, on left bank on downstream side of bridge on U.S. Highway 283, 0.5 mi downstream from Sergeant Major Creek, 1.0 mi north of Cheyenne, 5.2 mi upstream from Dead Indian Creek, and at mile 543.9.

DRAINAGE AREA.--794 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,900.98 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). May 1, 1938 to Nov. 16, 1946, and Oct. 1, 1947 to Jan. 11, 1948, nonrecording gage at site 50 ft upstream and datum 5.00 ft higher. Jan. 12, 1948 to Dec. 31, 1976, at site 50 ft upstream and datum 5.00 ft higher. Jan. 1, 1976 to Dec. 20, 1979, at site 50 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 21 to Dec. 16, 18-20, Dec. 25 to Jan. 14, 26-29, Feb. 10-13, Apr. 14-22, June 2 to July 7, 13-30, Aug. 16-18, and Sept. 22-28. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by numerous flood-retarding structures.

AVERAGE DISCHARGE.--49 years, 28.0 ft<sup>3</sup>/s, 20,290 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 69,800 ft<sup>3</sup>/s, Apr. 29, 1954, gage height, 15.24 ft (datum then in use); from rating curve extended above 27,000 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 3, 1934, reached a stage of 1.0 ft lower than that in 1954, at site on upstream side of highway fill (at old bridge site).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft<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)
Sept. 30	0115	*645	*9.21	No peaks greater than base discharge.			
No flow at times.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.11	9.8	15	17	18	16	15	3.0	24	22	.00	.00
2	.00	8.7	13	17	18	17	14	2.2	15	13	.00	.00
3	.00	8.2	15	17	18	17	13	2.0	16	11	.00	.00
4	.00	7.8	18	16	19	17	9.9	1.8	19	9.1	.00	.00
5	.00	7.7	15	16	20	17	8.4	1.5	20	8.2	.00	.00
6	.00	7.4	14	15	20	16	7.8	1.4	21	6.9	.00	.00
7	.00	7.1	14	13	19	17	7.4	1.2	31	5.8	.00	.00
8	.00	7.3	15	14	20	17	7.1	1.0	26	7.3	.00	.00
9	.09	7.3	16	15	20	18	6.3	.77	25	6.9	.00	.00
10	5.2	7.3	16	14	22	15	6.7	.95	25	4.3	.00	.00
11	15	7.0	16	15	20	15	6.8	1.3	22	4.6	.00	.00
12	14	6.9	17	16	21	17	8.2	1.4	18	4.2	.00	.00
13	9.1	7.5	18	16	23	18	7.2	1.2	18	4.2	.00	.00
14	8.3	14	19	17	27	18	7.0	.75	16	4.3	.00	.00
15	45	26	23	20	26	18	6.8	1.3	16	4.0	.00	.00
16	67	22	27	20	26	19	6.6	5.2	16	3.2	.00	.00
17	45	19	26	21	27	21	7.0	51	17	2.5	.00	11
18	35	18	21	19	26	22	6.8	84	16	2.0	.00	.79
19	26	16	20	19	23	24	6.8	46	15	1.6	.00	.61
20	21	15	18	19	21	27	6.6	35	15	.77	.00	.07
21	19	13	17	20	19	27	6.5	30	14	.11	.00	.00
22	17	13	18	18	18	26	6.6	20	14	.00	.00	.00
23	17	14	18	17	18	26	5.7	17	13	.00	.00	.00
24	15	13	17	17	18	24	6.9	15	13	.00	.00	.00
25	13	13	16	17	18	23	5.3	15	13	.00	.00	.00
26	13	13	16	16	18	23	5.4	12	11	.00	.00	.00
27	12	12	15	15	18	23	4.6	13	9.8	.00	.00	.00
28	12	12	15	15	16	26	4.2	16	9.8	.00	.00	34
29	11	13	16	17	---	23	4.4	16	8.8	.00	.00	74
30	9.8	14	17	18	---	22	3.6	15	8.5	.00	.00	326
31	9.3	---	17	17	---	20	---	12	---	.00	.00	---
TOTAL	438.90	360.0	538	523	577	629	218.6	423.97	505.9	125.98	.00	446.47
MEAN	14.2	12.0	17.4	16.9	20.6	20.3	7.29	13.7	16.9	4.06	.000	14.9
MAX	67	26	27	21	27	27	15	84	31	22	.00	326
MIN	.00	6.9	13	13	16	15	3.6	.75	8.5	.00	.00	.00
AC-FT	871	714	1070	1040	1140	1250	434	841	1000	250	.00	886

CAL YR 1985 TOTAL 4811.68 MEAN 13.2 MAX 101 MIN .00 AC-FT 9540  
WTR YR 1986 TOTAL 4786.82 MEAN 13.1 MAX 326 MIN .00 AC-FT 9490

## RED RIVER BASIN

07324200 WASHITA RIVER NEAR HAMMON, OK

LOCATION.--Lat 35°39'23", long 99°18'21", on west line of sec.26, T.14 N., R.20 W., Custer County, Hydrologic Unit 11130301, on right bank near county road bridge, 2.2 mi downstream from Quartermaster Creek, 4.7 mi northeast of Hammon, and at mile 494.5.

DRAINAGE AREA.--1,387 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,643.22 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Dec. 1, 2, 5-7, 11-21, 26-29, Jan. 5-12, Apr. 8-23, and Sept. 8-30. Records fair. Some regulation by numerous flood-retarding structures.

AVERAGE DISCHARGE.--17 years, 31.7 ft<sup>3</sup>/s, 22,970 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,000 ft<sup>3</sup>/s, May 17, 1982, gage height, 23.44 ft, from rating curve extended above 2,500 ft<sup>3</sup>/s on basis of slope-area measurement; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft<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)
June 2	1200	*615	*10.88	No peaks greater than base discharge.			

Minimum daily discharge, 0.24 ft<sup>3</sup>/s, Oct. 5-8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.60	11	13	20	18	20	18	6.0	46	15	2.3	54
2	.38	11	12	20	18	20	17	5.3	384	30	2.3	12
3	.38	11	18	19	18	19	19	5.0	63	22	2.3	7.4
4	.38	11	17	19	18	19	18	4.6	50	21	2.2	8.1
5	.24	11	15	18	18	19	17	4.3	41	18	1.9	10
6	.24	10	13	18	18	18	17	3.8	38	16	1.8	9.1
7	.24	9.8	14	17	19	18	16	3.6	45	66	1.9	8.1
8	.24	9.8	20	17	20	17	16	3.5	101	40	1.6	7.0
9	.66	9.8	19	16	20	17	15	3.4	55	19	21	5.7
10	1.2	9.8	18	18	24	17	14	3.3	150	18	7.8	4.0
11	1.5	9.7	13	18	28	17	14	3.2	183	16	4.4	6.9
12	1.7	9.6	12	20	25	17	13	2.9	58	16	2.6	4.9
13	.85	9.8	13	22	23	16	13	2.4	42	15	2.0	3.3
14	.72	14	15	21	22	17	13	2.2	34	14	5.7	2.1
15	.66	25	21	20	26	17	12	2.7	35	12	12	6.1
16	2.3	19	20	20	28	17	11	3.4	35	12	8.0	17
17	2.8	21	18	20	28	17	13	17	28	11	3.6	30
18	18	21	17	20	28	17	12	20	25	9.3	2.7	22
19	20	20	16	20	27	17	11	19	55	8.1	2.2	15
20	18	18	15	19	26	17	10	31	34	7.2	1.7	8.5
21	16	17	17	19	25	18	9.8	24	28	6.7	1.5	6.3
22	15	17	22	18	24	18	9.5	20	26	6.2	1.6	3.6
23	15	17	21	18	24	18	9.4	18	28	5.7	1.6	9.0
24	14	16	21	18	23	17	8.6	17	31	5.3	1.9	6.7
25	13	16	20	18	22	18	8.1	112	26	4.8	2.1	5.1
26	13	16	18	18	22	17	7.6	118	20	4.4	1.7	3.1
27	13	16	19	18	21	16	7.9	24	18	4.0	1.5	2.4
28	11	16	17	18	20	16	7.0	19	16	3.4	1.2	1.7
29	12	16	18	18	---	16	6.9	17	16	3.0	1.2	11
30	12	16	20	18	---	17	6.4	17	15	2.6	1.2	70
31	11	---	20	18	---	17	---	17	---	2.4	3.3	---
TOTAL	216.09	434.3	532	581	633	541	370.2	549.6	1726	434.1	108.8	360.1
MEAN	6.97	14.5	17.2	18.7	22.6	17.5	12.3	17.7	57.5	14.0	3.51	12.0
MAX	20	25	22	22	28	20	19	118	384	66	21	70
MIN	.24	9.6	12	16	18	16	6.4	2.2	15	2.4	1.2	1.7
AC-FT	429	861	1060	1150	1260	1070	734	1090	3420	861	216	714

CAL YR 1985 TOTAL 5408.24 MEAN 14.8 MAX 170 MIN .24 AC-FT 10730  
WTR YR 1986 TOTAL 6486.19 MEAN 17.8 MAX 384 MIN .24 AC-FT 12870



WATER-QUALITY RECORDS

WATER TEMPERATURE: October 1969 to September 1979.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[illegible]

07324200 WASHITA RIVER NEAR HAMMON, OK--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[illegible]

## 07324200 WASHITA RIVER NEAR HAMMON, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---		1760	1740				---	---	---	---	
2	---		---	---				---	---	---	---	
3	---		---	---				---	---	---	---	
4	---		---	---				---	---	---	2280	
5	---		---	1720				---	---	---	---	
6	2320		---	---				---	---	---	---	
7	---		---	---				---	---	---	---	
8	---		---	---				---	738	---	---	
9	---		---	---				---	---	---	---	
10	---		---	---				---	---	---	---	
11	---		---	---				---	---	---	---	
12	---		---	1800				---	---	---	---	
13	---		---	---				---	---	---	---	
14	---		---	---				---	---	---	---	
15	---		---	---				---	---	---	---	
16	---		---	---				---	---	---	---	
17	---		---	---				---	---	---	---	
18	---		---	---				---	---	---	---	
19	---		---	---				1230	---	---	1920	
20	747		---	---				---	---	---	---	
21	---		---	---				---	1420	---	---	
22	---		---	---				---	---	---	---	
23	---		---	---				---	---	---	---	
24	---		---	---				---	---	---	---	
25	---		---	---				---	---	---	---	
26	---		---	1790				---	---	---	---	
27	1310		---	---				---	---	---	---	
28	---		---	---				---	---	---	---	
29	---		---	---				---	---	2320	---	
30	---		---	---				---	---	---	---	
31	---		---	---				---	---	---	---	
MEAN	1460		1760	1760				1230	1080	2320	2100	
WTR YR 1986		MEAN	1650	MAX	2320	MIN		738				

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---		.0	5.5				---	---	---	---	
2	---		---	---				---	---	---	---	
3	---		---	---				---	---	---	---	
4	---		---	---				---	---	---	25.0	
5	---		---	4.0				---	---	---	---	
6	17.0		---	---				---	---	---	---	
7	---		---	---				---	---	---	---	
8	---		---	---				---	28.0	---	---	
9	---		---	---				---	---	---	---	
10	---		---	---				---	---	---	---	
11	---		---	---				---	---	---	---	
12	---		---	7.0				---	---	---	---	
13	---		---	---				---	---	---	---	
14	---		---	---				---	---	---	---	
15	---		---	---				---	---	---	---	
16	---		---	---				---	---	---	---	
17	---		---	---				---	---	---	---	
18	---		---	---				---	---	---	---	
19	---		---	---				23.0	---	---	35.0	
20	17.0		---	---				---	---	---	---	
21	---		---	---				---	30.0	---	---	
22	---		---	---				---	---	---	---	
23	---		---	---				---	---	---	---	
24	---		---	---				---	---	---	---	
25	---		---	---				---	---	---	---	
26	---		---	6.0				---	---	---	---	
27	21.0		---	---				---	---	---	---	
28	---		---	---				---	---	---	---	
29	---		---	---				---	---	35.0	---	
30	---		---	---				---	---	---	---	
31	---		---	---				---	---	---	---	
MEAN	18.5		.0	5.5				23.0	29.0	35.0	30.0	
WTR YR 1986		MEAN	18.0	MAX	35.0	MIN		.0				

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

## RED RIVER BASIN

## 07324300 FOSS RESERVOIR NEAR FOSS, OK

LOCATION.--Lat 35°32'18", long 99°10'40", in S 1/2 sec.2, T.12 N., R.19 W., Custer County, Hydrologic Unit 11130301, near right end of dam on Washita River, 0.5 mi upstream from Oak Creek, 3.5 mi west of Stafford, 6.0 mi north of Foss, and at mile 474.4.

DRAINAGE AREA.--1,496 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation). Prior to October, 1961, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earth dam. Outlet consists of four 6- by 7-foot, 6-inch high pressure gates and one uncontrolled spillway. Storage began Feb. 13, 1961. Capacity, 436,500 acre-ft, at elevation 1,668.6 ft, crest of drop inlet and 256,100 acre-ft, at elevation 1,652.0 ft, conservation pool. Dead storage, 12,420 acre-ft below elevation 1,597.2 ft, sill of gated outlet. Figures given herein represent total contents. Reservoir is designed for flood control, municipal water supply (inactive), and irrigation release. Revised capacity table used after Sept. 30, 1964. Water-quality samples were collected at 3 profile sites in the Reservoir.

COOPERATION.--Elevations and data on diversions furnished by Foss Reservoir Master Conservancy District.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 195,800 acre-ft, June 29, 1977, elevation, 1,644.53 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 137,700 acre-ft, July 11, elevation, 1,635.50 ft; minimum, 129,800 acre-ft, May 16, elevation, 1,634.10 ft.

## MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Elevation (feet)*	Contents (acre-feet)	Change in contents (acre-feet)	Diversions (acre-feet)
Sept. 30.....	1635.04	135,000	-	-
Oct. 31.....	1635.00	134,800	-200	113
Nov. 30.....	1634.90	134,300	-500	130
Dec. 31.....	1634.40	131,500	-2,800	115
CAL YR 85.....	-	-	-9,000	1,877
Jan. 31.....	1634.40	131,500	0	121
Feb. 28.....	1634.40	131,500	0	105
Mar. 31.....	1634.10	129,800	-1,700	119
Apr. 30.....	1634.11	129,900	+100	137
May 31.....	1634.25	130,700	+800	167
June 30.....	1635.10	135,400	+4,700	123
July 31.....	1635.00	134,800	-600	189
Aug. 31.....	1634.70	133,200	-1,600	146
Sept. 30.....	1635.00	134,800	+1,600	101
WTR YR 86.....	-	-	-200	1,566

\* Elevation at 0800 on the following day.

## RED RIVER BASIN

353325099111000 FOSS RESERVOIR AT SITE NO. 1 NEAR FOSS, OK

LOCATION.--Lat 35°33'25", long 99°11'10", in SW 1/4 sec.35, T.13 N., R.19 W., Custer County, Hydrologic Unit 11130301, over old river channel, 600 ft from left edge of water on a bearing of 250° from concrete structure at north end of dam.

PERIOD OF RECORD.--Water year 1980 to current year.

REMARKS.--Samples were collected in a Kemmerer sampler near bottom, mid-depth, and surface. Specific conductance, water temperature, pH, and dissolved oxygen were determined in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)
NOV										
19...	1042	1028	80020	1.00	134000	1790	7.90	--	12.0	3.9
19...	1055	1028	1028	5.00	134000	1790	8.00	--	12.0	--
19...	1056	1028	1028	10.0	134000	1790	7.90	--	12.0	--
19...	1057	1028	1028	15.0	134000	1790	7.90	--	12.0	--
19...	1058	1028	1028	20.0	134000	1800	7.90	--	12.0	--
19...	1100	1028	80020	25.0	134000	1800	7.90	--	12.0	4.6
19...	1101	1028	1028	30.0	134000	1800	7.90	--	12.0	--
19...	1106	1028	1028	35.0	134000	1800	7.90	--	12.0	--
19...	1108	1028	1028	40.0	134000	1800	7.90	--	12.0	--
19...	1109	1028	1028	45.0	134000	1800	8.00	--	12.0	--
19...	1110	1028	1028	50.0	134000	1800	8.00	--	12.0	--
19...	1111	1028	80020	53.0	134000	1800	8.10	--	12.0	4.3
MAR										
28...	0940	1028	80020	1.00	130000	2020	8.00	20.0	13.0	2.1
28...	0953	1028	1028	5.00	130000	2020	8.00	20.0	13.5	--
28...	0956	1028	1028	10.0	130000	2060	8.20	20.0	12.5	--
28...	0958	1028	1028	15.0	130000	2090	8.20	20.0	12.0	--
28...	1001	1028	1028	20.0	130000	2060	8.20	20.0	12.5	--
28...	1004	1028	80020	25.0	130000	2050	8.20	20.0	12.5	2.1
28...	1007	1028	1028	30.0	130000	2080	8.20	20.0	12.5	--
28...	1010	1028	1028	35.0	130000	2080	8.20	20.0	11.5	--
28...	1013	1028	1028	40.0	130000	2070	8.20	20.0	11.5	--
28...	1016	1028	1028	45.0	130000	2040	8.20	20.0	11.5	--
28...	1034	1028	80020	50.0	130000	2030	8.20	20.0	12.0	33
JUN										
23...	1145	1028	80020	1.00	135000	1950	7.80	--	25.5	1.0
23...	1146	1028	1028	5.00	135000	1980	7.80	--	24.5	--
23...	1147	1028	1028	10.0	135000	1990	7.70	--	24.5	--
23...	1148	1028	1028	15.0	135000	2050	7.60	--	24.5	--
23...	1149	1028	1028	20.0	135000	2070	7.60	--	24.5	--
23...	1150	1028	80020	25.0	135000	2090	7.60	--	24.5	1.5
23...	1151	1028	1028	30.0	135000	2110	7.50	--	24.0	--
23...	1152	1028	1028	35.0	135000	2120	7.30	--	23.0	--
23...	1153	1028	1028	40.0	135000	2150	7.30	--	22.5	--
23...	1154	1028	1028	45.0	135000	2170	7.20	--	22.5	--
23...	1155	1028	80020	50.0	135000	2190	7.20	--	22.0	25

353325099111000 FOSS RESERVOIR AT SITE NO. 1 NEAR FOSS, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM
NOV									
19...	716	8.6	85	920	790	170	120	97	18
19...	716	8.6	85	--	--	--	--	--	--
19...	716	8.7	86	--	--	--	--	--	--
19...	716	8.7	86	--	--	--	--	--	--
19...	716	8.7	86	--	--	--	--	--	--
19...	716	8.8	87	920	790	170	120	96	18
19...	716	8.9	88	--	--	--	--	--	--
19...	716	8.8	87	--	--	--	--	--	--
19...	716	8.7	86	--	--	--	--	--	--
19...	716	8.7	86	--	--	--	--	--	--
19...	716	8.7	86	--	--	--	--	--	--
19...	716	8.7	86	920	800	170	120	96	18
MAR									
28...	720	9.8	99	960	830	170	130	100	18
28...	720	10.2	104	--	--	--	--	--	--
28...	720	10.2	103	--	--	--	--	--	--
28...	720	10.1	100	--	--	--	--	--	--
28...	720	10.1	101	--	--	--	--	--	--
28...	720	10.2	102	920	770	170	120	95	18
28...	720	10.1	101	--	--	--	--	--	--
28...	720	10.1	99	--	--	--	--	--	--
28...	720	10.2	100	--	--	--	--	--	--
28...	720	10.0	98	--	--	--	--	--	--
28...	720	9.6	95	960	830	170	130	110	20
JUN									
23...	720	7.8	102	920	790	170	120	96	18
23...	720	7.9	101	--	--	--	--	--	--
23...	720	7.8	100	--	--	--	--	--	--
23...	720	7.7	99	--	--	--	--	--	--
23...	720	7.7	99	--	--	--	--	--	--
23...	720	7.5	96	1000	870	190	130	100	18
23...	720	7.2	91	--	--	--	--	--	--
23...	720	5.8	72	--	--	--	--	--	--
23...	720	5.0	62	--	--	--	--	--	--
23...	720	4.6	57	--	--	--	--	--	--
23...	720	3.7	45	1000	870	190	130	100	18
DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
NOV									
19...	1	9.7	158	0	129	3.2	960	61	1580
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	1	9.8	154	0	126	3.1	950	60	1240
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	1	9.9	148	0	122	1.9	950	60	1580
MAR									
28...	1	12	162	0	133	2.6	850	61	1640
28...	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--
28...	1	12	176	0	144	1.8	870	58	1630
28...	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--
28...	2	12	158	0	132	1.6	870	69	1580
JUN									
23...	1	11	--	--	--	4.0	950	60	1640
23...	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--
23...	1	12	166	0	136	6.6	970	62	1630
23...	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--
23...	1	12	--	--	--	18	970	72	1640



## RED RIVER BASIN

353325099111000 FOSS RESERVOIR AT SITE NO. 1 NEAR FOSS, OK--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	SAMPLING DEPTH (FEET)	RESERVOIR STORAGE (AC-FT)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)
SEP										
16...	1023	1028	80020	1.00	134000	1980	8.00	22.0	22.0	2.0
16...	1031	1028	1028	5.00	134000	1940	7.90	22.0	22.5	--
16...	1034	1028	1028	10.0	134000	2000	7.80	22.0	22.0	--
16...	1036	1028	1028	15.0	134000	1980	7.80	22.0	22.5	--
16...	1038	1028	1028	20.0	134000	1980	7.80	22.0	22.0	--
16...	1040	1028	1028	25.0	134000	2000	7.90	22.0	22.0	--
16...	1042	1028	80020	30.0	134000	1990	7.90	22.0	22.5	2.3
16...	1045	1028	1028	35.0	134000	1980	7.90	22.0	22.0	--
16...	1048	1028	1028	40.0	134000	1990	7.90	22.0	22.0	--
16...	1050	1028	1028	45.0	134000	1970	7.80	22.0	22.0	--
16...	1054	1028	1028	50.0	134000	1980	7.80	22.0	22.0	--
16...	1057	1028	80020	56.0	134000	1990	7.80	22.0	22.0	17

DATE	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PERCENT SATURATION)	HARDNESS (MG/L AS CaCO3)	HARDNESS NONCARBONATE (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	PERCENT SODIUM
SEP									
16...	720	7.4	91	930	810	160	130	95	18
16...	720	7.7	95	--	--	--	--	--	--
16...	720	7.2	88	--	--	--	--	--	--
16...	720	7.2	88	--	--	--	--	--	--
16...	720	7.2	88	--	--	--	--	--	--
16...	720	7.2	88	--	--	--	--	--	--
16...	720	7.2	88	930	810	160	130	94	18
16...	720	7.1	87	--	--	--	--	--	--
16...	720	6.6	81	--	--	--	--	--	--
16...	720	6.3	77	--	--	--	--	--	--
16...	720	6.3	77	--	--	--	--	--	--
16...	720	5.9	72	930	810	160	130	90	17

DATE	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICARBONATE, IT-FLD (MG/L AS HCO3)	CARBONATE, IT-FLD (MG/L AS CO3)	ALKALINITY, CARBONATE, IT-FLD (MG/L AS CaCO3)	CARBON DIOXIDE, DIS-SOLVED (MG/L AS CO2)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)
SEP									
16...	1	12	--	--	--	2.4	940	59	1500
16...	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--
16...	1	12	151	0	124	3.0	930	57	1560
16...	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--
16...	1	12	--	--	--	3.8	940	57	1460

## RED RIVER BASIN

## 353405099132500 FOSS RESERVOIR AT SITE NO. 2 NEAR FOSS OK

LOCATION.--Lat 35°34'05", long 99°13'25", in SE 1/4 sec.28, T.13 N., R.19 W., Custer County, Hydrologic Unit 11130301, over old river channel, 900 ft from left edge of water on a bearing 155° from campgrounds on north shore.

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	SAMPLE PLING DEPTH (FEET)	RESER-VOIR STORAGE (AC-FT)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN, DIS-SOLVED (MG/L)
NOV											
19...	1203	1028	1028	1.00	134000	1800	8.10	11.5	716	8.9	87
19...	1204	1028	1028	5.00	134000	1800	8.10	11.5	716	9.0	88
19...	1205	1028	1028	10.0	134000	1800	8.10	11.5	716	9.1	89
19...	1207	1028	1028	15.0	134000	1800	8.10	11.5	716	9.1	89
19...	1208	1028	1028	20.0	134000	1800	8.10	11.5	716	9.1	89
19...	1209	1028	1028	25.0	134000	1810	8.10	11.5	716	9.1	89
19...	1210	1028	1028	30.0	134000	1800	8.10	11.5	716	9.2	90
19...	1211	1028	1028	35.0	134000	1800	8.10	11.5	716	9.2	90
MAR											
28...	1112	1028	1028	1.00	130000	--	8.20	15.0	720	9.1	--
28...	1124	1028	1028	5.00	130000	--	8.20	13.5	720	9.5	--
28...	1126	1028	1028	10.0	130000	--	8.40	13.5	720	9.4	--
28...	1129	1028	1028	15.0	130000	--	8.30	13.0	720	9.6	--
JUN											
23...	1300	1028	1028	1.00	135000	2120	8.10	25.5	720	8.7	114
23...	1305	1028	1028	5.00	135000	2120	8.10	25.5	720	9.6	125
23...	1310	1028	1028	10.0	135000	2100	8.00	25.0	720	9.1	118
23...	1315	1028	1028	15.0	135000	2090	8.00	25.0	720	8.7	112
23...	1320	1028	1028	20.0	135000	2110	8.00	25.0	720	8.4	109
23...	1325	1028	1028	27.0	135000	1990	7.70	25.0	720	6.9	89
SEP											
16...	1126	1028	1028	1.00	134000	1920	8.10	23.5	720	8.3	104
16...	1127	1028	1028	5.00	134000	1960	8.10	23.0	720	8.1	101
16...	1128	1028	1028	10.0	134000	1920	8.10	23.0	720	8.0	100
16...	1131	1028	1028	11.0	134000	1980	8.10	23.0	720	8.0	100

## 353615099135000 FOSS RESERVOIR AT SITE NO. 3 NEAR FOSS, OK

LOCATION.--Lat 35°36'15", long 99°13'50", in SE 1/4 sec.17, T.13 N., R.19 W., Custer County, Hydrologic Unit 11130301, over old river channel, 600 ft from left edge of water on a bearing 240° from small tributary on north shore.

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	SAMPLE PLING DEPTH (FEET)	RESER-VOIR STORAGE (AC-FT)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN, DIS-SOLVED (MG/L)
NOV											
19...	1228	1028	1028	1.00	134000	1780	8.20	11.0	716	9.3	90
19...	1229	1028	1028	5.00	134000	1780	8.20	11.0	716	9.3	90
19...	1230	1028	1028	10.0	134000	1780	8.10	11.0	716	9.2	90
19...	1231	1028	1028	15.0	134000	1780	8.10	11.0	716	9.3	91
19...	1232	1028	1028	18.0	134000	1780	8.10	11.0	716	9.2	90
MAR											
28...	1149	1028	1028	1.00	130000	--	8.20	14.0	720	9.1	--
28...	1152	1028	1028	5.00	130000	--	8.20	14.0	720	9.4	--
28...	1154	1028	1028	10.0	130000	--	8.20	13.5	720	9.5	--
28...	1157	1028	1028	15.0	130000	--	8.20	13.0	720	9.6	--
28...	1201	1028	1028	18.0	130000	--	8.20	13.0	720	9.6	--
JUN											
23...	1340	1028	1028	1.00	135000	1900	8.00	27.0	720	7.5	101
23...	1345	1028	1028	5.00	135000	1940	8.00	26.5	720	7.5	100
23...	1350	1028	1028	10.0	135000	1970	8.00	26.0	720	7.7	101
23...	1355	1028	1028	15.0	135000	2090	8.00	25.5	720	6.8	89
23...	1400	1028	1028	20.0	135000	2130	7.80	25.0	720	6.2	80
SEP											
16...	1142	1028	1028	1.00	134000	1950	8.20	23.5	720	8.2	103
16...	1144	1028	1028	5.00	134000	1970	8.20	23.0	720	7.9	99
16...	1147	1028	1028	10.0	134000	1960	8.20	23.0	720	7.7	96
16...	1148	1028	1028	15.0	134000	1960	8.10	23.0	720	7.7	96
16...	1150	1028	1028	18.0	134000	1970	8.00	23.0	720	7.1	89

## RED RIVER BASIN

255

07324400 WASHITA RIVER NEAR FOSS, OK

LOCATION.--Lat 35°32'20", long 99°10'10", in SW 1/4 SW 1/4 sec.1, T.12 N., R.19 W., Custer County, Hydrologic Unit 11130302, on right bank at upstream side county road bridge, 0.4 mi downstream from Oak Creek, 0.9 mi downstream from Foss Dam, 2.5 mi west of Stafford, 6.0 mi north of Foss, and at mile 473.5.

DRAINAGE AREA.--1,551 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1956 to April 1957, February to December 1958, July 1961 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,560 ft from preliminary survey by Topographic Division.

REMARKS.--Estimated daily discharges: Jan. 31, Feb. 26, and Mar. 18, 19. Records poor. Except for 55 mi<sup>2</sup> intervening area, flow completely regulated since 1961 by Foss Reservoir (station 07324300).

AVERAGE DISCHARGE.--25 years, (water years 1962-86), 23.5 ft<sup>3</sup>/s, 17,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 14,000 ft<sup>3</sup>/s, Apr. 9, 1957, gage height, 20.40 ft, from rating curve extended above 3,600 ft<sup>3</sup>/s, on basis of velocity-area study; no flow at times in 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1959 reached a stage of 23.4 ft, from floodmark.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,000 ft<sup>3</sup>/s, Sept. 30, gage height, 19.08 ft; minimum daily discharge, 2.1 ft<sup>3</sup>/s, Jan. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.3	9.1	9.5	9.2	4.2	4.5	7.4	3.7	8.4	7.2	4.7	117
2	8.1	9.2	9.5	9.2	4.8	4.5	4.3	3.5	10	7.9	4.8	58
3	8.3	9.0	9.5	9.2	4.7	4.2	4.0	3.4	14	7.0	4.1	139
4	8.5	9.0	9.5	9.3	4.2	4.3	3.9	3.5	5.7	6.7	3.5	110
5	8.5	9.0	9.5	9.5	4.4	4.4	3.9	3.7	4.7	6.2	3.7	28
6	8.5	9.1	9.5	9.5	4.4	4.2	3.8	3.6	4.7	6.2	4.7	21
7	8.6	9.0	9.4	9.4	4.4	4.5	3.8	3.4	13	105	4.1	18
8	8.7	9.1	9.5	9.4	4.5	4.7	3.7	3.0	9.4	32	4.1	14
9	8.7	9.2	9.5	6.5	4.1	4.7	3.6	3.1	5.9	22	3.5	12
10	8.8	9.1	9.2	2.2	4.5	4.8	3.8	3.4	15	12	3.7	10
11	8.7	9.2	9.2	2.1	4.4	4.8	3.8	3.0	8.0	8.1	3.2	9.6
12	8.5	9.2	9.2	3.6	4.4	4.8	3.9	3.2	6.6	6.5	4.0	7.3
13	8.5	9.5	9.3	2.6	4.6	4.8	3.8	2.7	6.0	5.6	3.5	7.6
14	8.7	9.9	9.3	2.6	4.7	4.8	3.8	3.0	6.0	5.4	13	32
15	8.4	10	9.5	5.0	4.5	4.9	3.6	3.2	7.0	5.5	4.8	26
16	8.5	9.6	9.3	4.8	4.6	4.7	3.8	4.7	6.4	5.2	3.7	47
17	8.7	9.6	9.4	4.8	4.5	4.7	3.7	18	6.5	5.5	3.7	29
18	9.1	9.5	9.2	4.7	4.5	4.5	3.9	6.9	5.6	4.8	3.6	21
19	8.9	9.5	9.2	4.7	4.5	4.3	3.4	5.1	6.0	4.4	3.5	18
20	8.7	9.4	9.2	4.7	4.8	4.5	3.8	4.2	5.9	4.4	4.4	15
21	8.7	9.5	9.4	4.6	4.7	4.7	4.0	4.5	5.3	4.3	4.0	13
22	8.9	9.5	9.3	4.7	4.3	4.6	4.5	4.7	5.9	4.1	3.6	12
23	9.0	9.6	9.3	4.5	4.5	4.5	3.8	4.7	9.7	4.1	3.7	11
24	8.9	9.5	9.4	4.7	4.4	4.5	3.9	5.2	8.1	4.4	3.9	11
25	9.0	9.5	9.2	4.9	4.4	4.5	4.0	5.5	6.7	4.7	3.8	9.0
26	9.0	9.5	9.2	4.9	4.4	4.8	3.9	4.9	6.6	4.7	3.9	8.4
27	9.0	9.5	9.2	4.6	5.7	4.9	3.8	4.5	6.3	4.7	5.8	8.5
28	9.0	9.5	9.2	4.6	4.7	4.8	3.5	4.9	5.9	4.6	5.5	17
29	9.0	9.3	9.5	4.6	---	4.8	3.6	4.8	5.9	4.6	3.7	309
30	9.0	9.3	9.4	4.2	---	4.6	3.5	4.5	5.7	4.5	3.4	565
31	9.1	---	9.4	4.2	---	4.7	---	4.6	---	4.4	112	---
TOTAL	270.3	280.9	289.9	173.5	126.8	143.0	118.2	141.1	220.9	316.7	241.6	1703.4
MEAN	8.72	9.36	9.35	5.60	4.53	4.61	3.94	4.55	7.36	10.2	7.79	56.8
MAX	9.1	10	9.5	9.5	5.7	4.9	7.4	18	15	105	112	565
MIN	8.1	9.0	9.2	2.1	4.1	4.2	3.4	2.7	4.7	4.1	3.2	7.3
AC-FT	536	557	575	344	252	284	234	280	438	628	479	3380

CAL YR 1985 TOTAL 3842.0 MEAN 10.5 MAX 85 MIN 6.7 AC-FT 7620  
WTR YR 1986 TOTAL 4026.3 MEAN 11.0 MAX 565 MIN 2.1 AC-FT 7990

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1947-48, 1950-51, 1956, 1958, 1970 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1946 to September 1948, October 1969 to September 1976.

WATER TEMPERATURE: October 1946 to September 1948, October 1969 to September 1976.

REMARKS.--Samples were collected by a local observer on a weekly basis. A partial analysis was made bimonthly on one of these samples. Additional samples were collected semiannually and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)
OCT										
21...	0900	1028	80020	6.79	8.2	1990	7.70	--	16.0	--
NOV										
20...	1100	1028	80020	6.93	9.4	2090	7.10	7.0	10.0	731
JAN										
15...	1715	1028	1028	6.48	5.0	2140	7.40	18.0	7.5	--
20...	0900	1028	80020	6.44	4.3	2150	7.50	--	6.0	--
MAR										
31...	0900	1028	80020	6.44	3.5	2530	8.00	--	11.0	--
APR										
24...	1640	1028	1028	6.48	4.2	3050	6.80	--	--	--
MAY										
22...	1630	1028	80020	6.49	4.8	2340	7.30	39.0	26.5	797
26...	0830	1028	80020	6.56	6.2	2420	8.00	--	20.0	--
JUN										
24...	0900	1028	80020	6.71	9.8	2360	7.70	--	24.0	--
JUL										
09...	1830	1028	1028	7.38	20	946	7.20	30.0	27.0	--
AUG										
04...	0900	1028	80020	6.36	3.5	2010	8.30	--	23.0	--
21...	1030	1028	1028	6.41	4.6	2880	6.80	24.0	24.0	--

[illegible]

## 257

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[illegible][illegible][illegible]

## RED RIVER BASIN

07324400 WASHITA RIVER NEAR FOSS, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	---	1460
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	2350	2240	---	---	---	---	---	---
4	---	2160	---	---	---	---	---	---	---	---	2010	---
5	---	---	---	---	---	---	---	2760	---	---	---	---
6	---	---	---	2010	---	---	---	---	---	---	---	---
7	2210	---	---	---	---	---	---	---	---	2100	---	---
8	---	---	---	---	---	---	---	---	---	---	---	1460
9	---	---	---	---	---	---	---	---	2130	---	---	---
10	---	---	---	---	2200	2330	---	---	---	---	---	---
11	---	1440	---	---	---	---	---	---	---	---	2420	---
12	---	---	1990	---	---	---	---	2670	---	---	---	---
13	---	---	---	2380	---	---	---	---	---	---	---	---
14	2170	---	---	---	---	---	---	---	---	2090	---	---
15	---	---	---	---	---	---	---	---	---	---	---	570
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	2290	2220	---	---	---	---	---	---
18	---	1770	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	2380	---	---	2580	---
20	---	---	---	2150	---	---	---	---	---	---	---	---
21	1990	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	2030	---	---	---	---	---	---	---	---	1570
24	---	---	---	---	2200	2430	---	---	2360	---	---	---
25	---	1880	---	---	---	---	---	---	---	---	2490	---
26	---	---	---	---	---	---	---	2420	---	---	---	---
27	---	---	---	2170	---	---	---	---	---	---	---	---
28	2170	---	---	---	---	---	2140	---	---	2460	---	---
29	---	---	---	---	---	---	---	---	---	---	---	608
30	---	---	2020	---	---	---	---	---	2530	---	---	---
31	---	---	---	---	---	2530	---	---	---	---	---	---
MEAN	2140	1810	2010	2180	2260	2350	2140	2560	2340	2220	2380	1130
WTR YR 1986		MEAN	2100	MAX	2760		MIN	570				

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	---	24.0
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	10.0	9.0	---	---	---	---	---	---
4	---	14.0	---	---	---	---	---	---	---	---	23.0	---
5	---	---	---	---	---	---	---	19.0	---	---	---	---
6	---	---	---	4.0	---	---	---	---	---	---	---	---
7	15.0	---	---	---	---	---	---	---	---	24.0	---	---
8	---	---	---	---	---	---	---	---	---	---	---	24.0
9	---	---	---	---	---	---	---	---	24.0	---	---	---
10	---	---	---	---	3.0	11.0	---	---	---	---	---	---
11	---	11.0	---	---	---	---	---	---	---	---	24.0	---
12	---	---	3.0	---	---	---	---	19.0	---	---	---	---
13	---	---	---	4.0	---	---	---	---	---	---	---	---
14	15.0	---	---	---	---	---	---	---	---	24.0	---	---
15	---	---	---	---	---	---	---	---	---	---	---	24.0
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	12.0	11.0	---	---	---	---	---	---
18	---	13.0	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	20.0	---	---	25.0	---
20	---	---	---	6.0	---	---	---	---	---	---	---	---
21	16.0	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	2.0	---	---	---	---	---	---	---	---	---
24	---	---	---	---	8.0	12.0	---	---	24.0	---	---	---
25	---	13.0	---	---	---	---	---	---	---	---	24.0	---
26	---	---	---	---	---	---	---	20.0	---	---	---	---
27	---	---	---	4.0	---	---	---	---	---	---	---	---
28	17.0	---	---	---	---	---	22.0	---	---	24.0	---	---
29	---	---	---	---	---	---	---	---	---	---	---	22.0
30	---	---	4.0	---	---	---	---	---	24.0	---	---	---
31	---	---	---	---	---	11.0	---	---	---	---	---	---
MEAN	16.0	13.0	3.0	4.5	8.5	11.0	22.0	19.5	24.0	24.0	24.0	23.5
WTR YR 1986		MEAN	15.5	MAX	25.0		MIN	2.0				

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR



## RED RIVER BASIN

259

## 07325000 WASHITA RIVER NEAR CLINTON, OK

LOCATION.--Lat 34°31'52", long 98°57'57", in SW 1/4 NE 1/4 sec.11, T.12 N., R.17 W., Custer County, Hydrologic Unit 11130302, on downstream side of pier of bridge on U.S. Highway 183, 0.5 mi north of Clinton, 0.8 mi upstream from Beaver Creek, 4.8 mi downstream from Barnitz Creek, and at mile 447.4.

DRAINAGE AREA.--1,977 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1935 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1221: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,467.44 ft, National Geodetic Vertical Datum of 1929. See WSP 1920 for history of changes prior to Mar. 19, 1941.

REMARKS.--Estimated daily discharges: Dec. 2-6, 13-15, Feb. 11-13, and July 16 to Aug. 7, 10-14. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated since February 1961 by Foss Reservoir (station 07324300) and by numerous flood-retarding structures.

AVERAGE DISCHARGE.--Prior to regulation by Foss Reservoir, 25 years (water years 1936-60), 146 ft<sup>3</sup>/s, 105,700 acre-ft/yr; since regulation by Foss Reservoir, 26 years (water years 1961-86), 61.5 ft<sup>3</sup>/s, 44,560 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 66,800 ft<sup>3</sup>/s, May 16, 1951, gage height, 31.09 ft, from rating curve extended above 7,900 ft<sup>3</sup>/s, by contracted-opening measurement of peak flow; no flow at times in 1952-56, 1964, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 3-4, 1934, reached a stage of 33.9 ft, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,370 ft<sup>3</sup>/s, Sept. 30, gage height, 20.03 ft; stage rising, peak occurred Oct. 1, 1986; minimum daily discharge, 6.2 ft<sup>3</sup>/s, Aug. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	15	14	19	15	14	13	11	9.6	11	7.0	326
2	13	15	13	19	14	14	23	10	99	12	7.4	273
3	12	15	12	19	15	14	20	9.6	85	8.6	7.0	214
4	11	15	13	18	15	13	16	9.3	40	8.2	6.8	340
5	11	15	14	18	15	14	15	9.1	21	7.6	6.6	301
6	11	15	15	19	15	13	14	9.1	16	7.5	6.4	109
7	12	15	18	17	15	13	13	8.9	15	44.1	6.2	70
8	11	15	18	17	16	13	12	8.9	40	432	33	54
9	19	15	18	16	16	14	12	9.9	24	137	126	47
10	26	15	17	14	13	13	12	16	47	82	21	43
11	18	15	17	13	12	13	11	28	114	53	15	40
12	15	16	16	14	13	14	11	11	43	75	10	38
13	14	16	15	15	14	13	11	9.0	20	44	8.6	37
14	14	41	17	15	15	13	11	8.7	15	24	7.6	50
15	14	49	20	15	17	14	10	8.7	14	19	81	119
16	14	24	23	15	17	14	10	12	19	16	53	638
17	14	24	25	15	17	14	10	104	16	14	27	733
18	20	21	20	15	17	13	10	69	15	12	18	275
19	18	19	18	15	17	14	11	40	11	11	15	106
20	15	18	18	16	15	14	11	21	9.7	10	13	78
21	14	18	18	15	15	15	10	15	9.1	9.0	14	68
22	14	18	18	15	15	15	10	13	8.4	8.6	13	59
23	14	18	18	15	15	14	10	11	60	8.0	13	53
24	14	18	18	15	15	13	10	10	51	7.6	13	51
25	22	18	18	14	15	13	9.8	24	28	7.9	13	48
26	65	18	19	14	14	13	9.8	19	19	7.7	12	45
27	29	18	19	14	14	13	14	13	12	7.3	13	44
28	18	17	19	15	14	13	18	11	9.6	7.0	17	53
29	16	17	19	15	---	12	18	10	8.8	7.4	16	429
30	15	18	19	15	---	12	13	9.9	8.3	7.0	14	2150
31	15	---	19	15	---	12	---	9.7	---	7.2	21	---
TOTAL	532	571	545	486	420	416	378.6	558.8	887.5	1509.6	634.6	6891
MEAN	17.2	19.0	17.6	15.7	15.0	13.4	12.6	18.0	29.6	48.7	20.5	230
MAX	65	49	25	19	17	15	23	104	114	441	126	2150
MIN	11	15	12	13	12	12	9.8	8.7	8.3	7.0	6.2	37
AC-FT	1060	1130	1080	964	833	825	751	1110	1760	2990	1260	13670

CAL YR 1985 TOTAL 8057.5 MEAN 22.1 MAX 182 MIN 9.5 AC-FT 15980  
WTR YR 1986 TOTAL 13830.1 MEAN 37.9 MAX 2150 MIN 6.2 AC-FT 27430

## RED RIVER BASIN

07325500 WASHITA RIVER AT CARNEGIE, OK

LOCATION.--Lat 35°07'02", long 98°33'49", in NW 1/4 NW 1/4 sec.3, T.7 N., R.13 W., Caddo County, Hydrologic Unit 11130302, on downstream side of right pier of bridge on State Highway 9, 1,300 ft upstream from Running Creek, 2.7 mi east of Carnegie, and at mile 353.9. Records include flow of Running Creek.

DRAINAGE AREA.--3,129 mi<sup>2</sup>, includes that of Running Creek.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1937 to current year.

REVISED RECORDS.--WSP 1087: 1938. WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,244.23 ft, National Geodetic Vertical Datum of 1929.

Prior to October 1942, water-stage recorder at site 8.0 mi upstream at datum 24.57 ft higher. Prior to Aug. 7, 1985, datum 5.00 ft higher.

REMARKS.--Estimated daily discharges: Feb. 6-9, 12, and Aug. 13, 17, 25. Records fair. Some diversion above station for irrigation. October 1942 to May 1949, occasional fluctuation caused by powerplant at Carnegie, 7.5 mi above station. Some regulation by Foss Reservoir since February 1961 (station 07324300), and by numerous flood-retarding structures.

AVERAGE DISCHARGE.--Prior to regulation by Foss Reservoir, 23 years (water years 1938-60), 314 ft<sup>3</sup>/s, 277,500 acre-ft/yr; since regulation by Foss Reservoir, 25 years (water years 1962-86), 243 ft<sup>3</sup>/s, 176,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,000 ft<sup>3</sup>/s, May 18, 1949, gage height, 26.21 ft, from rating curve extended above 35,500 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow, maximum gage height, 26.70 ft/s, Oct. 20, 1983; no flow at times in 1956 and 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 23, 1903, reached a stage of about 29 ft, at former site and datum, from information by local resident; flood of May 18, 1949, reached a stage of 20.9 ft, from floodmark, at that site and datum.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft<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. 19	2145	4,840	23.19	Sept. 30	Unknown	*11,100	*28.61 (HWM)

Minimum daily discharge, 27 ft<sup>3</sup>/s, Aug. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1740	152	133	115	97	87	78	96	145	104	40	72
2	431	145	119	115	97	85	92	87	139	100	34	235
3	219	139	109	114	98	84	109	80	135	97	31	240
4	143	131	123	113	98	84	184	75	224	92	27	349
5	109	127	132	111	98	84	151	70	253	92	30	290
6	90	121	135	109	100	84	106	68	190	88	33	363
7	80	114	133	106	102	84	98	67	188	88	31	327
8	70	113	129	106	105	90	91	67	183	145	39	222
9	64	109	129	103	106	87	85	181	153	492	42	168
10	69	107	127	101	104	85	83	457	1170	587	48	140
11	77	105	126	105	96	87	81	460	2510	341	143	125
12	109	99	124	113	94	99	80	407	1390	253	99	116
13	120	99	124	114	106	104	80	369	896	220	73	114
14	349	126	106	112	103	103	76	488	555	186	61	109
15	311	256	109	108	110	98	75	989	353	154	55	117
16	231	942	118	105	107	97	74	1150	300	125	53	292
17	148	459	130	103	108	99	72	1480	268	101	78	1410
18	2120	279	129	103	106	98	71	2120	228	86	102	1950
19	4700	223	129	103	104	96	79	1670	195	77	79	1020
20	3530	192	126	103	100	92	80	833	167	64	62	470
21	1340	170	124	103	98	89	78	540	147	64	52	295
22	868	158	123	102	96	89	77	369	134	62	49	227
23	657	151	123	101	94	87	73	286	225	57	47	194
24	481	146	121	99	91	85	69	238	294	53	45	173
25	427	142	120	98	89	85	66	202	351	42	41	156
26	375	141	118	98	89	82	66	191	248	47	44	143
27	337	139	116	97	88	82	181	277	178	67	58	136
28	275	135	116	95	88	82	315	342	138	49	65	658
29	254	132	115	95	---	81	176	225	119	46	90	1160
30	198	131	115	96	---	79	122	182	109	43	66	6810
31	165	---	115	97	---	80	---	158	---	41	61	---
TOTAL	20087	5483	3796	3243	2772	2748	3068	14224	11585	4063	1778	18081
MEAN	648	183	122	105	99.0	88.6	102	459	386	131	57.4	603
MAX	4700	942	135	115	110	104	315	2120	2510	587	143	6810
MIN	64	99	106	95	88	79	66	67	109	41	27	72
AC-FT	39840	10880	7530	6430	5500	5450	6090	28210	22980	8060	3530	35860
CAL YR 1985	TOTAL 86591	MEAN 237	MAX 4700	MIN 20	AC-FT 171800							
WTR YR 1986	TOTAL 90928	MEAN 249	MAX 6810	MIN 27	AC-FT 180400							

## RED RIVER BASIN

261

07325500 WASHITA RIVER AT CARNEGIE, OK--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1948 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1953 to September 1976.

WATER TEMPERATURE: October 1953 to September 1976.

REMARKS.--Samples were collected by a local observer on a weekly basis. A partial analysis was made bimonthly on one of these samples. An additional sample was collected and specific conductance, pH, water temperature, and dissolved oxygen was determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COLLECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, (PERCENT SATURATION)
NOV												
21...	1100	1028	80020	6.68	170	1520	7.80	--	9.0	--	--	--
21...	1400	1028	80020	6.66	168	1640	7.80	5.0	8.0	730	10.2	90
DEC												
18...	1100	1028	80020	6.33	131	2320	7.80	--	0.0	--	--	--
MAR												
21...	1400	1028	80020	5.91	90	2290	7.90	--	14.0	--	--	--
MAY												
01...	1800	1028	80020	5.92	91	1830	8.40	--	24.0	--	--	--
17...	1535	1028	80020	13.70	1520	737	6.95	17.0	20.0	720	7.9	92
JUN												
17...	1500	1028	80020	--	269	1530	8.00	--	28.0	--	--	--
AUG												
21...	1800	1028	80020	5.40	50	1450	8.00	--	28.0	--	--	--

DATE	HARDNESS (MG/L AS CAC03)	HARDNESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICARBONATE IT-FLD (MG/L AS HC03)	CARBONATE IT-FLD (MG/L AS C03)	ALKALINITY, CARBONATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS-SOLVED (MG/L AS C02)
NOV												
21...	--	--	--	--	--	--	--	--	--	--	--	6.0
21...	760	570	200	64	84	19	1	5.5	--	--	--	5.9
DEC												
18...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
21...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
01...	--	--	--	--	--	--	--	--	--	--	--	--
17...	260	190	73	20	34	21	0.9	7.9	93	0	76	17
JUN												
17...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
21...	--	--	--	--	--	--	--	--	--	--	--	2.6

DATE	SULFATE DIS-SOLVED (MG/L AS S04)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITROGEN, NITRATE DIS-SOLVED (MG/L AS N)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N02)	NITROGEN, N02+N03 DIS-SOLVED (MG/L AS N)
NOV												
21...	600	88	--	--	1190	--	--	--	--	--	--	--
21...	590	80	0.30	14	1220	1200	1.7	553	0.950	0.020	0.07	0.970
DEC												
18...	1000	150	--	--	1990	--	--	--	--	--	--	--
MAR												
21...	970	120	--	--	1990	--	--	--	--	--	--	--
MAY												
01...	780	87	--	--	1500	--	--	--	--	--	--	--
17...	210	41	0.20	8.0	457	440	0.62	1880	0.410	0.030	0.10	0.440
JUN												
17...	600	72	--	--	1140	--	--	--	--	--	--	--
AUG												
21...	610	51	--	--	1130	--	--	--	--	--	--	--

## RED RIVER BASIN

07325500 WASHITA RIVER AT CARNEGIE, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 21...	--	--	--	--	--	--	--	--	--	--	--	--
21...	<100	3	290	<1	<10	3	11	1	39	0.1	--	14
DEC 18...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 21...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 01...	--	--	--	--	--	--	--	--	--	--	--	--
17...	60	2	130	<1	<10	9	77	6	7	<0.1	<1	12
JUN 17...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 21...	--	--	--	--	--	--	--	--	--	--	--	--

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	2400	---	---	---	1830	---	---	2280	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	2410	---	---	1850	---	---
4	986	---	2160	---	---	---	---	---	---	---	---	645
5	---	---	---	---	---	---	---	---	2020	---	---	---
6	---	1910	---	---	---	2470	---	---	---	---	---	---
7	---	---	---	---	1940	---	---	---	---	---	2300	---
8	---	---	---	2330	---	---	2330	2340	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	702	---	993
11	1710	---	---	---	---	---	---	---	---	---	---	---
12	---	---	2240	---	2450	---	---	---	936	---	---	---
13	---	---	---	---	2230	---	---	---	---	---	---	---
14	---	1960	---	---	---	2060	---	---	---	---	982	---
15	---	---	---	---	---	---	---	838	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	2300	---	---	2390	---	1530	1110	---	---
18	853	---	2320	---	---	---	---	---	---	---	---	520
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	1520	---	---	---	2290	---	998	---	---	1450	---
22	---	---	---	2350	2460	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	2430	---	---	1820	---	1290
25	947	---	---	---	---	---	---	---	---	---	---	---
26	---	---	2370	---	---	---	---	---	949	---	---	---
27	---	---	---	---	---	2430	---	---	---	---	---	---
28	---	2200	---	2390	---	---	---	---	---	---	2120	---
29	---	---	---	---	---	---	---	1080	---	---	---	---
30	1600	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MEAN	1220	1900	2270	2350	2270	2310	2390	1420	1360	1370	1830	862
WTR YR 1986		MEAN	1790	MAX	2470	MIN	520					

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

## RED RIVER BASIN

263

07325500 WASHITA RIVER AT CARNEGIE, OK--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	.5	---	---	---	24.0	---	---	31.0	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	20.0	---	---	26.0	---	---
4	18.0	---	.0	---	---	---	---	---	---	---	---	21.0
5	---	---	---	---	---	---	---	---	24.0	---	---	---
6	---	14.0	---	---	---	21.0	---	---	---	---	---	---
7	---	---	---	---	11.0	---	---	---	---	---	30.0	---
8	---	---	---	4.0	---	---	18.0	24.0	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	28.0	---	21.0
11	16.0	---	---	---	---	---	---	---	---	---	---	---
12	---	---	3.0	---	.0	---	---	---	27.0	---	---	---
13	---	---	---	---	11.0	---	---	---	---	---	---	---
14	---	11.0	---	---	---	14.0	---	---	---	---	---	---
15	---	---	---	---	---	---	---	20.0	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	.5	---	---	21.0	---	28.0	29.0	---	---
18	18.0	---	.0	---	---	---	---	---	---	---	---	24.0
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	9.0	---	---	---	14.0	---	22.0	---	---	28.0	---
22	---	---	---	.5	11.0	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	26.0	---	---	30.0	---	26.0
25	17.0	---	---	---	---	---	---	---	---	---	---	---
26	---	---	.5	---	---	---	---	---	28.0	---	---	---
27	---	---	---	---	---	22.0	---	---	---	---	---	---
28	---	7.0	---	5.0	---	---	---	---	---	---	26.0	---
29	---	---	---	---	---	---	---	25.0	---	---	---	---
30	15.0	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MEAN	17.0	10.5	1.0	2.0	8.5	18.0	21.5	23.0	27.0	28.5	29.0	23.0
WTR YR 1986		MEAN	17.0	MAX	31.0	MIN		.0				

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

## RED RIVER BASIN

07325800 COBB CREEK NEAR EAKLY, OK

LOCATION.--Lat 35°17'26", long 98°35'38", in NW 1/4 NE 1/4 sec.5, T.9 N., R.13 W., Caddo County, Hydrologic Unit 11130302, near left downstream abutment of bridge, on State Highway 152, 0.5 mi downstream from Fivemile Creek, 2.4 mi southwest of Eakly, 3.0 mi upstream from Fort Cobb Reservoir, and at mile 22.9.

DRAINAGE AREA.--132 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 1,369.70 ft, National Geodetic Vertical Datum of 1929. Oct. 29, 1980 to Aug. 11, 1982 gage at site 0.5 mi downstream at same datum.

REMARKS.--Estimated daily discharges: Nov. 30 to Dec. 2, Feb. 8-12, and June 3 to July 21, 23. Records fair, except winter periods, which are rated poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by three small reservoirs having combined surface-area of 262 acres and capacity of 3,100 acre-ft.

AVERAGE DISCHARGE.--18 years, 20.8 ft<sup>3</sup>/s, 15,070 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 10,000 ft<sup>3</sup>/s, Sept. 29, 1986, gage height, 24.38 ft; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,000 ft<sup>3</sup>/s, Sept. 29, gage height, 24.38 ft; minimum daily, 4.5 ft<sup>3</sup>/s, Aug. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.9	12	13	13	12	12	9.6	9.7	17	23	4.7	9.9
2	9.0	11	14	13	13	10	48	9.4	15	18	4.5	9.0
3	9.9	11	15	13	13	11	26	8.8	19	12	5.1	8.8
4	10	10	15	13	13	11	16	8.7	38	9.8	5.2	9.0
5	11	12	15	13	13	11	14	8.4	20	9.3	5.3	9.0
6	13	12	15	13	13	11	13	8.4	18	8.6	5.2	8.6
7	14	12	15	13	13	11	12	9.4	25	21	5.2	8.4
8	14	13	15	12	12	11	12	15	21	14	5.3	8.4
9	18	13	14	12	12	11	10	24	19	11	6.1	8.4
10	25	14	13	12	11	11	10	117	60	9.7	6.7	8.4
11	26	14	13	12	12	12	10	102	24	13	6.1	8.3
12	24	15	13	12	13	12	10	35	15	11	6.0	8.2
13	27	17	13	12	14	12	10	27	13	9.8	6.1	7.9
14	48	46	13	12	15	12	9.8	172	12	9.0	6.8	14
15	28	70	13	12	15	13	9.7	252	11	8.6	7.6	13
16	20	32	13	12	14	14	9.0	66	13	8.2	6.7	25
17	45	25	13	12	14	13	9.0	207	23	7.8	6.5	36
18	690	22	13	12	13	14	8.9	120	12	7.6	6.1	27
19	265	19	12	12	13	14	9.9	38	11	7.1	5.8	15
20	119	17	13	12	13	13	11	26	19	6.8	5.5	11
21	44	16	13	12	12	12	9.7	20	11	6.4	5.7	8.6
22	32	15	13	12	12	12	9.2	17	10	6.2	5.9	7.8
23	27	15	13	12	12	12	9.0	16	12	5.9	5.9	7.2
24	22	15	13	12	12	12	9.0	15	24	5.7	6.5	6.7
25	19	15	13	12	12	12	9.0	16	27	5.5	6.8	6.0
26	17	15	12	12	12	12	21	18	15	5.4	7.0	13
27	16	15	13	12	12	12	76	23	13	5.2	15	87
28	14	15	13	12	12	12	17	19	11	4.9	11	9.5
29	13	15	12	12	---	11	11	16	10	4.9	8.1	3750
30	12	14	13	12	---	11	9.9	16	9.8	4.9	7.5	685
31	12	---	13	12	---	10	---	16	---	4.7	8.7	---
TOTAL	1653.8	547	414	379	357	367	448.7	1455.8	547.8	285.0	204.6	4834.1
MEAN	53.3	18.2	13.4	12.2	12.7	11.8	15.0	47.0	18.3	9.19	6.60	161
MAX	690	70	15	13	15	14	76	252	60	23	15	3750
MIN	9.0	10	12	12	11	10	8.9	8.4	9.8	4.7	4.5	6.0
AC-FT	3280	1080	821	752	708	728	890	2890	1090	565	406	9590

CAL YR 1985 TOTAL 5849.8 MEAN 16.0 MAX 690 MIN 3.2 AC-FT 11600  
WTR YR 1986 TOTAL 11493.8 MEAN 31.5 MAX 3750 MIN 4.5 AC-FT 22800



## RED RIVER BASIN

265

## 07325900 FORT COBB RESERVOIR NEAR FORT COBB, OK

LOCATION.--Lat 35°09'30", long 98°27'40", in SE 1/4 sec.21, T.8 N., R.12 W., Caddo County, Hydrologic Unit 11130382, in control house at right center of dam on Cobb Creek, 4.0 mi northwest of Fort Cobb, and at mile 7.5.

DRAINAGE AREA.--304 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation). Prior to October, 1961, nonrecording gage at same datum.

REMARKS.--Reservoir is formed by earth dam. Outlet consists of two sets of controlled 5- by 5-foot steel gates and an uncontrolled concrete spillway. Storage began Mar. 30, 1959. Conservation pool was first filled in June 1962. Capacity, 143,700 acre-ft at elevation 1,354.8 ft, crest of drop inlet, 80,010 acre-ft at elevation 1,342.0 ft, conservation pool, and 1,664 acre-ft at elevation 1,300.0 ft, crest of gated outlet. Figures given herein represent total contents. Reservoir is used for flood control, for municipal and industrial water supply, and for irrigation releases. Revised capacity table used since May 1, 1964.

COOPERATION.--Elevations and data on diversions furnished by Fort Cobb Reservoir Master Conservancy District.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 114,200 acre-ft, June 4, 1982, elevation, 1,349.44 ft; minimum since conservation pool was first filled, 54,650 acre-ft, Oct. 19, 1972, elevation 1,335.06 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 100,300 acre-ft, Sept. 30, elevation, 1,346.60 ft; minimum, 64,400 acre-ft, Oct. 9, elevation 1,337.93 ft.

## MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Elevation (feet)*	Contents (acre-feet)	Change in contents (acre-feet)	Diversions (acre-feet)
Sept. 30.....	1338.09	64,970	-	-
Oct. 31.....	1339.09	68,640	+3,670	796
Nov. 30.....	1339.10	68,680	+40	724
Dec. 31.....	1339.22	69,120	+440	783
CAL YR 85.....	-	-	+5,470	8,821
Jan. 31.....	1339.20	69,050	-70	841
Feb. 28.....	1339.34	69,570	+520	720
Mar. 31.....	1339.30	69,420	-150	682
Apr. 30.....	1339.40	69,800	+380	861
May 31.....	1342.37	81,530	+11,730	654
June 30.....	1343.29	85,400	+3,870	701
July 31.....	1342.46	81,910	-3,490	960
Aug. 31.....	1341.43	77,700	-4,210	1,188
Sept. 30.....	1346.60	100,300	+22,600	690
WTR YR 86.....	-	-	+35,330	9,600

\*Elevation at 0800 on following day.

## RED RIVER BASIN

## 07326000 COBB CREEK NEAR FORT COBB, OK

LOCATION.--Lat 35°08'37", long 98°26'33", in NE 1/4 NE 1/4 sec.27, T.8 N., R.12 W., Caddo County, Hydrologic Unit 11130302, on left bank 10 ft upstream from county road bridge, 0.3 mi upstream from Punjo Creek, 1.2 mi downstream from Fort Cobb Dam, 3.0 mi north of Fort Cobb, and at mile 5.8.

DRAINAGE AREA.--313 mi<sup>2</sup>: Area at site used prior to Oct. 1, 1969, 319 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1939 to current year. Monthly discharge only for some periods, published in WSP 1311. Prior to October 1960, published as Pond Creek near Fort Cobb.

REVISED RECORDS.--WSP 1087: 1938. WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,254.49 ft, U.S. Bureau of Reclamation datum. Oct. 1, 1969 to Sept. 30, 1982 gage at same site and datum 5.00 ft higher. Oct. 1, 1939 to Aug. 29, 1940, nonrecording gage and Aug. 30, 1940 to Sept. 30, 1969, water-stage recorder at site 0.8 mi downstream at datum 1.92 ft lower.

REMARKS.--Estimated daily discharges: May 19-22, 24, May 28 to June 23, and Aug. 1 to Sept. 15. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated since March 1959 by Fort Cobb Reservoir (station 07325900).

AVERAGE DISCHARGE.--(Prior to regulation by Fort Cobb Reservoir) 19 years (water years 1940-58), 50.2 ft<sup>3</sup>/s, 36,340 acre-ft/yr; (since regulation by Fort Cobb Reservoir) 28 years (water years 1959-86), 16.9 ft<sup>3</sup>/s, 12,240 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,000 ft<sup>3</sup>/s, May 17, 1949, gage height, 18.72 ft, from floodmark in gage well at former site and datum, from rating curve extended above 4,300 ft<sup>3</sup>/s, on basis of contracted-opening measurements at gage heights 16.62 ft, 17.58 ft, and 18.72 ft, at former site and datum; minimum daily, 0.2 ft<sup>3</sup>/s, Sept. 20, 24-28, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 15, 1937, reached a stage of 19.3 ft, site and datum used in 1939, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 1,250 ft<sup>3</sup>/s, May 17, gage height, 18.44 ft; minimum daily discharge, 1.8 ft<sup>3</sup>/s, Oct. 1-4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	2.4	2.4	2.6	2.6	2.9	3.8	3.9	3.9	3.4	23	18
2	1.8	2.4	2.5	2.5	2.7	2.9	3.9	4.0	3.8	3.3	18	14
3	1.8	2.4	2.5	2.5	2.7	3.0	4.3	4.0	3.7	3.0	18	6.2
4	1.8	2.4	2.5	2.6	2.7	3.0	4.0	3.8	3.7	2.9	18	3.8
5	1.9	2.4	2.9	2.6	2.7	3.0	4.0	3.7	3.6	3.0	18	3.1
6	1.9	2.5	2.9	2.5	2.7	2.9	3.9	3.6	3.6	2.9	18	3.0
7	2.0	2.2	3.0	2.4	2.7	3.1	4.0	3.6	3.5	3.1	18	3.1
8	2.0	2.2	3.0	2.4	2.7	3.0	4.0	38	3.5	3.0	18	3.2
9	2.0	2.3	3.0	2.4	2.6	3.0	4.0	14	3.4	2.7	18	3.0
10	2.0	2.2	3.0	2.4	2.6	3.1	4.0	12	3.5	2.9	18	2.9
11	2.0	2.1	3.0	2.4	2.7	3.1	4.1	3.6	3.4	2.7	18	2.8
12	2.1	2.2	2.9	2.4	2.7	3.2	4.0	3.6	3.4	2.7	18	2.9
13	2.0	2.2	2.9	2.4	2.8	3.2	4.0	3.9	3.3	2.6	18	2.8
14	2.1	2.2	2.9	2.4	2.8	3.2	4.2	63	3.2	2.6	18	3.0
15	2.1	2.2	3.0	2.4	2.8	3.2	4.4	25	3.3	2.7	18	2.9
16	2.1	2.3	2.9	2.5	2.8	3.3	4.6	72	3.3	2.6	18	2.9
17	2.8	2.2	2.9	2.6	2.8	3.3	4.6	217	3.2	2.6	18	2.9
18	5.0	2.2	2.9	2.5	2.8	3.3	4.8	16	3.1	2.5	18	2.9
19	2.1	2.3	2.9	2.5	2.8	3.3	4.5	5.4	3.3	2.4	18	2.9
20	2.2	2.3	2.8	2.6	2.8	3.4	4.4	4.3	3.2	2.6	18	3.0
21	2.7	2.3	2.7	2.7	2.8	3.4	4.3	4.1	3.2	2.5	18	3.0
22	2.4	2.3	2.7	2.6	2.9	3.5	4.4	4.0	3.1	2.4	18	3.1
23	2.1	2.3	2.7	2.6	2.9	3.5	4.2	3.9	3.0	2.4	18	3.1
24	2.2	2.4	2.7	2.6	2.9	3.5	4.0	3.8	2.9	2.4	18	3.1
25	2.2	2.4	2.7	2.6	2.9	3.5	3.9	5.6	3.0	2.4	18	3.1
26	2.2	2.4	2.7	2.7	3.0	3.6	3.9	12	3.1	2.4	18	3.2
27	2.2	2.4	2.7	2.8	3.0	3.6	4.0	8.4	3.1	2.4	18	3.4
28	2.2	2.4	2.7	2.8	2.8	3.7	3.9	4.5	3.0	2.4	18	3.3
29	2.3	2.4	2.6	2.8	---	3.7	3.7	4.2	3.0	2.4	18	95
30	2.4	2.4	2.6	2.8	---	3.8	3.6	4.0	3.1	11	18	9.8
31	2.4	---	2.6	2.6	---	3.8	---	3.9	---	29	18	---
TOTAL	68.8	69.3	86.2	79.2	77.7	102.0	123.4	562.8	99.4	117.9	563	219.4
MEAN	2.22	2.31	2.78	2.55	2.77	3.29	4.11	18.2	3.31	3.80	18.2	7.31
MAX	5.0	2.5	3.0	2.8	3.0	3.8	4.8	217	3.9	29	23	95
MIN	1.8	2.1	2.4	2.4	2.6	2.9	3.6	3.6	2.9	2.4	18	2.8
AC-FT	136	137	171	157	154	202	245	1120	197	234	1120	435

CAL YR 1985 TOTAL 1371.5 MEAN 3.76 MAX 31 MIN .34 AC-FT 2720  
WTR YR 1986 TOTAL 2169.1 MEAN 5.94 MAX 217 MIN 1.8 AC-FT 4300

## 07326500 WASHITA RIVER AT ANADARKO, OK

LOCATION.--Lat 35°05'06", long 98°14'35", in NW 1/4 sec.15, T.7 N., R.10 W., Caddo County, Hydrologic Unit 11130302 at left bank 100 ft upstream from bridge on U.S. Highway 281 at north edge of Anadarko, 8.1 mi upstream from Sugar Creek, and at mile 305.2.

DRAINAGE AREA.--3,656 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1902 to September 1908; June 1924 to June 1925, published as "near Anadarko", October 1935 to February 1938; October 1963 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1311: 1903, 1907-08, drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,150.00 ft, National Geodetic Vertical Datum of 1929. October 26, 1902 to June 30, 1908, nonrecording gage at former bridge 125 ft downstream at datum estimated to be 2.8 ft higher. May 25, 1924 to June 30, 1925, nonrecording gage at county road bridge 14 mi downstream at different datum. Jan. 10, 1936 to Mar. 7, 1938, non-recording gage on upstream side of bridge on U.S. Highway 281 at datum 1.88 ft higher.

REMARKS.--Estimated daily discharges: Oct. 22-24, Nov. 17-18, May 11-12, 21-31, June 1-10, 14-30, July 1-20, 22-31, Aug. 1-31, and Sept. 1-15, 17, 21-28. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by low-water dams upstream and since March 1959, by Fort Cobb Reservoir (station 07325900), since February 1961, by Foss Reservoir (station 07324300), and by numerous flood-retarding structures.

AVERAGE DISCHARGE.--31 years (water years 1903-08, 1936-37, 1964-86), 367 ft<sup>3</sup>/s, 265,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,700 ft<sup>3</sup>/s, Oct. 21, 1983, gage height, 25.20 ft HWM; no flow Aug. 1, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 1949, reached an elevation of 1,176.7 ft, from floodmark, at right bank on downstream side of bridge on U.S. Highway 281.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft<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. 20	1630	*4,490	*16.83	May 17	1730	3,390	14.48

Minimum daily discharge, 50 ft<sup>3</sup>/s, Aug. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1770	218	162	144	146	145	117	161	220	140	60	112
2	1630	203	160	143	149	146	119	129	200	138	56	108
3	423	191	155	143	152	145	126	114	190	132	54	201
4	228	185	140	142	155	145	151	106	290	130	50	312
5	157	177	145	141	154	145	194	99	270	128	54	392
6	123	172	157	139	152	146	181	95	296	120	58	347
7	106	169	160	139	155	146	160	91	315	118	52	375
8	93	163	159	137	157	148	139	93	270	115	53	391
9	86	161	157	139	158	153	125	388	250	145	54	309
10	101	158	158	135	160	154	120	397	230	360	56	224
11	99	154	155	131	162	165	115	473	1030	543	69	189
12	102	156	154	138	159	168	112	420	2360	363	76	169
13	111	154	153	141	148	176	110	372	990	282	142	156
14	137	177	147	146	151	181	107	335	800	253	100	154
15	340	216	147	146	164	184	106	965	500	218	70	150
16	321	380	139	145	165	178	105	1240	360	198	79	155
17	210	1050	141	144	170	168	104	3180	320	168	78	293
18	418	586	151	143	169	163	102	2570	280	150	90	1550
19	2950	308	156	142	168	155	104	2520	250	120	100	1760
20	4400	258	157	144	165	148	108	1710	220	113	107	850
21	2940	226	158	143	160	143	109	900	210	110	89	475
22	2200	205	157	142	157	140	105	600	190	104	82	320
23	1400	192	154	140	154	136	104	450	185	98	72	250
24	870	183	154	139	152	133	101	350	232	91	68	200
25	544	178	152	140	150	132	95	290	322	76	62	190
26	492	176	147	140	150	129	91	270	370	77	67	180
27	439	171	146	139	148	126	95	370	336	76	84	214
28	402	168	143	139	146	123	125	369	220	70	101	349
29	344	167	142	139	---	119	283	441	170	68	108	1140
30	281	164	143	139	---	116	214	270	150	64	121	3780
31	250	---	144	141	---	118	---	250	---	62	130	---
TOTAL	23967	7066	4693	4363	4376	4574	3827	20018	12026	4830	2442	15295
MEAN	773	236	151	141	156	148	128	646	401	156	78.8	510
MAX	4400	1050	162	146	170	184	283	3180	2360	543	142	3780
MIN	86	154	139	131	146	116	91	91	150	62	50	108
AC-FT	47540	14020	9310	8650	8680	9070	7590	39710	23850	9580	4840	30340
CAL YR 1985	TOTAL	96674		MEAN	265	MAX	4400	MIN	49	AC-FT	191800	
WTR YR 1986	TOTAL	107477		MEAN	294	MAX	4400	MIN	50	AC-FT	213200	

## 07327490 LITTLE WASHITA RIVER NEAR NINNEKAH, OK

LOCATION.--Lat 34°56'41", long 97°57'08", in SE 1/4 SE 1/4 sec.32, T.6 N., R.7 W., Grady County, Hydrologic Unit 11130302, at left bank on downstream side of bridge on U.S. Highway 81, 1.0 mi upstream from Rock Creek, 1.5 mi west of Ninneka, 5.5 mi south of Chickasha, and at mile 8.4.

DRAINAGE AREA.--208 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1963 to December 1985 (discontinued).

REVISED RECORDS.--WDR OK-64(M), OK-65(M), OK-71.

GAGE.--Water-stage recorder. Datum of gage is 1,065.94 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Small diversions above station for irrigation.

COOPERATION.--Records furnished by Agricultural Research Service.

AVERAGE DISCHARGE.--22 years (water years 1964-85), 34.8 ft<sup>3</sup>/s, 25,210 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,380 ft<sup>3</sup>/s, Oct. 20, 1983, gage height, 25.00 ft; no flow at times in most years.

EXTREMES FOR CURRENT PERIOD.--October to December 1985: Maximum discharge during period, 1,360 ft<sup>3</sup>/s, Oct. 18, gage height, 13.85 ft, no peak discharge greater than base discharge of 1,500 ft<sup>3</sup>/s; minimum daily discharge, 22 ft<sup>3</sup>/s, Oct. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80	56	55									
2	47	52	55									
3	39	48	55									
4	33	47	55									
5	30	47	55									
6	26	45	55									
7	25	43	53									
8	23	45	51									
9	22	45	52									
10	79	43	50									
11	89	46	58									
12	56	48	57									
13	49	56	57									
14	162	179	57									
15	135	440	57									
16	68	193	57									
17	57	94	56									
18	910	122	55									
19	415	105	55									
20	146	69	52									
21	86	62	55									
22	76	57	53									
23	67	57	54									
24	59	57	53									
25	159	57	54									
26	86	58	54									
27	60	57	54									
28	53	56	54									
29	53	55	56									
30	69	55	56									
31	61	---	54									
TOTAL	3320	2394	1694									
MEAN	107	79.8	54.6									
MAX	910	440	58									
MIN	22	43	50									
AC-FT	6590	4750	3360									
CAL YR 1985	TOTAL	40060	MEAN	110	MAX	1940	MIN	11	AC-FT	79460		

## RED RIVER BASIN

269

07328070 WINTER CREEK NEAR ALEX, OK

LOCATION.--Lat 34°59'35", long 97°45'40", in NE 1/4 sec.18, T.6 N., R.5 W., Grady County, Hydrologic Unit 11130303, at left bank 1,000 ft downstream from county road bridge, 0.7 mi downstream from East Winter Creek, 3.2 mi upstream from mouth, and 5.5 mi north of Alex.

DRAINAGE AREA.--33 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Water-stage recorder and broad crest V-notch weir. Datum of gage is 1,040.00 ft, National Geodetic Datum of 1929. Prior to Oct. 1, 1977, at datum 8.20 ft higher.

REMARKS.--Estimated daily discharges: Oct. 7 to Dec. 22, Dec. 24 to Jan. 15, and Aug. 3-11. Records fair, except for estimated days which are poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by 16 flood-retarding structures, combined capacity, 1,050 acre-ft. Minor diversions for irrigation above station.

AVERAGE DISCHARGE.--22 years, 10.3 ft<sup>3</sup>/s, 7,460 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,080 ft<sup>3</sup>/s, May 27, 1978, gage height, 17.35 ft; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<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)
May 14	2245	*336	*12.57	No peak greater than base discharge.			
Minimum daily discharge, 1.1 ft <sup>3</sup> /s, Aug. 20.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	13	21	9.7	7.9	7.1	7.2	9.7	14	6.6	1.9	3.0
2	9.6	11	15	9.8	8.5	7.4	8.2	8.7	13	6.9	1.4	2.9
3	7.9	10	12	9.6	10	7.6	60	7.9	14	6.9	1.3	2.9
4	6.2	9.6	11	9.6	9.1	7.5	49	7.2	15	6.1	1.2	3.1
5	5.8	9.4	10	9.8	8.8	7.3	34	6.8	19	5.0	2.0	3.4
6	5.6	9.2	9.6	9.6	9.8	7.0	20	6.7	18	4.1	1.8	3.0
7	5.4	9.0	10	9.6	10	6.7	16	6.7	19	4.0	1.7	2.6
8	5.2	8.8	9.8	9.4	10	6.6	14	6.7	16	4.1	1.6	2.6
9	5.4	9.0	9.6	9.4	10	6.7	12	6.6	14	6.1	1.5	2.6
10	20	8.8	9.2	9.6	9.5	7.0	11	9.9	24	6.0	3.0	3.8
11	15	8.6	10	9.6	9.5	12	10	11	19	3.7	2.3	7.5
12	8.0	9.4	12	9.4	9.5	14	10	9.2	15	2.8	2.1	2.7
13	15	20	14	9.2	8.8	11	10	8.4	13	2.4	2.1	2.5
14	30	27	12	9.2	9.1	10	9.3	49	12	2.6	1.9	4.5
15	25	60	11	9.0	9.1	11	8.5	110	12	2.2	1.6	5.8
16	15	45	10	9.0	9.1	11	8.2	82	20	2.0	1.9	8.3
17	17	35	9.8	8.3	9.1	9.7	8.1	129	20	2.0	2.6	7.4
18	70	50	10	7.4	8.8	10	8.5	79	15	4.1	2.2	5.4
19	50	56	9.8	7.0	8.8	8.9	11	61	13	12	1.3	3.8
20	30	45	9.6	6.7	8.5	8.3	12	46	11	10	1.1	3.5
21	22	36	10	6.7	8.2	8.2	11	30	11	9.4	1.6	3.3
22	16	32	10	6.8	7.9	7.6	9.8	21	9.6	7.5	1.9	3.3
23	13	26	9.7	6.8	8.8	7.3	9.5	16	9.3	3.8	1.8	3.1
24	11	21	9.6	7.0	7.9	7.3	9.0	14	9.8	3.5	2.0	2.9
25	10	18	9.9	7.1	7.6	7.2	8.7	15	9.2	5.1	1.9	3.2
26	9.6	16	9.8	6.8	7.9	7.1	8.3	22	8.6	2.6	1.7	3.1
27	9.0	14	9.7	6.8	7.6	7.3	17	38	8.0	2.0	3.1	4.0
28	8.6	13	9.8	6.8	7.3	7.3	12	25	7.2	1.8	2.7	4.1
29	14	12	9.6	7.1	---	7.2	10	19	6.7	1.7	2.2	6.3
30	18	17	9.7	6.8	---	7.1	9.6	16	6.5	1.6	1.9	7.3
31	15	---	9.6	7.3	---	7.1	---	15	---	1.6	2.2	---
TOTAL	504.3	658.8	332.8	256.9	247.1	257.5	431.9	892.5	401.9	140.2	59.5	121.9
MEAN	16.3	22.0	10.7	8.29	8.82	8.31	14.4	28.8	13.4	4.52	1.92	4.06
MAX	70	60	21	9.8	10	14	60	129	24	12	3.1	8.3
MIN	5.2	8.6	9.2	6.7	7.3	6.6	7.2	6.6	6.5	1.6	1.1	2.5
AC-FT	1000	1310	660	510	490	511	857	1770	797	278	118	242
CAL YR 1985	TOTAL	10749.3		MEAN	29.5	MAX	580	MIN	1.9	AC-FT	21320	
WTR YR 1986	TOTAL	4305.3		MEAN	11.8	MAX	129	MIN	1.1	AC-FT	8540	

## RED RIVER BASIN

07328100 WASHITA RIVER AT ALEX, OK

LOCATION.--Lat 34°55'35", Long 97°46'30", in NW 1/4 sec.7, T.5 N., R.5 W., Grady County, Hydrologic Unit 11130303, near left bank on downstream side of county road bridge, 1.0 mi north of Alex, 3.8 mi downstream from Winter Creek, and at mile 226.5.

DRAINAGE AREA.--4,787 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1964 to September 1986 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 1,000.00 ft above mean sea level.

REMARKS.--Estimated daily discharges: Oct. 5, 6, 13, 14, 20, 27, Nov. 3, 10, 11, 17, 24, 28, Dec. 1, 8, 11, 15, 22, Apr. 27, May 4, 11, 25, 26, June 1, July 27, 30, and Aug. 3, 10. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by Fort Cobb Reservoir (station 07325900), by Foss Reservoir (07324300), and by numerous flood-retarding structures.

COOPERATION.--Records furnished by Agricultural Research Service prior to January 1978.

AVERAGE DISCHARGE.--22 years, 440 ft<sup>3</sup>/s, 318,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,400 ft<sup>3</sup>/s, Oct. 21, 1983, gage height, 23.78 ft; no flow Aug. 13-18, 1970, Aug. 30 to Sept. 1, 1971.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,800 ft<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. 22	Unknown	4,680	10.67 (HWM)	May 18	0100	6,400	12.60
May 15	1800	*8,570	*14.76	Sept. 30	1000	6,900	13.12

Minimum daily discharge, 102 ft<sup>3</sup>/s, Aug. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	892	444	360	294	260	262	227	362	630	363	108	144
2	1330	393	358	291	265	261	232	334	589	351	110	166
3	1520	350	347	292	285	257	581	275	938	355	113	163
4	946	326	344	287	290	250	805	250	1650	323	115	169
5	582	309	336	281	283	245	509	220	1280	293	110	246
6	409	294	329	283	304	242	427	208	962	268	131	365
7	309	282	319	277	301	236	407	197	790	253	122	410
8	266	275	328	270	327	235	360	187	1020	244	106	374
9	231	261	336	266	320	240	331	183	660	235	102	409
10	428	250	329	269	321	236	292	582	1050	226	250	417
11	428	240	329	275	317	333	273	1200	1630	233	417	610
12	309	233	329	276	318	1030	273	1060	1860	588	218	346
13	334	250	324	269	323	561	266	860	2190	594	171	266
14	860	762	316	273	342	412	257	900	1630	450	150	247
15	798	2300	320	275	347	384	237	7250	1880	375	194	305
16	473	1840	324	286	351	424	227	4980	1690	332	181	254
17	473	1400	324	283	346	407	222	4850	1480	296	165	229
18	2500	1340	321	282	341	400	220	5840	1070	264	152	231
19	3030	1200	314	279	334	476	239	4470	817	243	138	692
20	2790	840	311	280	321	384	347	3560	649	218	133	1590
21	3600	606	319	277	307	332	321	2730	548	202	143	1240
22	3640	538	324	268	300	316	266	1790	482	193	161	861
23	2220	467	329	263	300	303	239	1420	565	174	142	622
24	1460	460	321	264	291	288	216	1110	548	169	129	482
25	1170	450	307	262	288	280	208	1000	610	154	125	403
26	1080	404	301	258	284	269	197	1200	678	140	125	342
27	870	372	300	254	277	268	300	1310	650	160	126	702
28	719	370	300	257	266	268	541	1100	566	193	135	593
29	634	362	302	256	---	259	431	787	478	126	152	1450
30	568	362	303	257	---	249	396	691	409	115	135	6210
31	481	---	297	259	---	236	---	663	---	104	135	---
TOTAL	35350	17980	10001	8463	8609	10343	9847	51569	29999	8234	4694	20538
MEAN	1140	599	323	273	307	334	328	1664	1000	266	151	685
MAX	3640	2300	360	294	351	1030	805	7250	2190	594	417	6210
MIN	231	233	297	254	260	235	197	183	409	104	102	144
AC-FT	70120	35660	19840	16790	17080	20520	19530	102300	59500	16330	9310	40740

CAL YR 1985 TOTAL 273062 MEAN 748 MAX 8440 MIN 94 AC-FT 541600  
WTR YR 1986 TOTAL 215627 MEAN 591 MAX 7250 MIN 102 AC-FT 427700



## RED RIVER BASIN

271

07328500 WASHITA RIVER NEAR PAULS VALLEY, OK

LOCATION.--Lat 34°45'17", long 97°15'04", in SE 1/4 sec.1. T.3 N., R.1 W., Garvin County, Hydrologic Unit 11130303, on downstream side of left pier of bridge on U.S. Highway 77, 2 mi northwest of Pauls Valley, 6 mi downstream from Owl Creek, 7 mi upstream from Washington Creek, and at mile 146.5.

DRAINAGE AREA.--5,330 mi<sup>2</sup>.

PERIOD OF RECORD.--May to December 1899 (gage heights only), October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311. Published as "at Pauls Valley, Indian Territory" in 1899.

GAGE.--Water-stage recorder. Datum of gage is 854.61 ft, National Geodetic Vertical Datum of 1929. During 1899, nonrecording gage at site 9 mi downstream, at different datum. Mar. 29, 1938 to Jan. 25, 1939, nonrecording gage and Jan. 26, 1939 to Oct. 6, 1948, water-stage recorder at site 0.7 mi upstream, at datum 1.53 ft higher. Mar. 11, 1975 to Jan. 26, 1981, water-stage recorder at site 200 ft upstream, and at same datum.

REMARKS.--No estimated daily discharges. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some diversion for irrigation above station. Some regulation since March 1959, by Fort Cobb Reservoir (station 07325900), since February 1961, by Foss Reservoir (station 07324300), and by numerous flood-retarding structures.

AVERAGE DISCHARGE.--49 years, 708 ft<sup>3</sup>/s, 512,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,800 ft<sup>3</sup>/s, May 18, 1957, gage height, 27.34 ft; maximum gage height, 29.88 ft, May 11, 1950; no flow in 1956, 1964, 1966-67, 1970-72.

EXTREMES OUTSIDE PERIOD OF RECORD.--Stream is reported to have receded to no flow in 1882 and in 1897 (from information by local resident).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft<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. 18	1200	*9,320	*12.90	May 16	1200	7,935	11.90

Minimum daily discharge, 182 ft<sup>3</sup>/s, Aug. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1210	654	629	438	460	495	495	608	1050	731	191	232
2	869	603	486	449	464	468	508	589	963	668	185	232
3	1350	534	457	449	468	468	552	584	919	626	185	316
4	1540	457	431	457	479	460	2560	508	1230	614	190	466
5	932	438	427	453	578	517	1820	453	2480	585	182	382
6	628	427	434	445	569	495	1330	413	2330	545	188	332
7	495	406	431	457	557	483	900	385	1550	508	240	408
8	427	388	431	449	566	464	801	357	1490	483	239	498
9	388	371	442	445	579	453	421	357	1460	465	216	508
10	395	354	449	442	566	543	508	409	1100	460	310	657
11	427	371	438	442	552	976	662	908	1320	451	289	892
12	534	347	445	445	552	3120	619	1410	1800	440	494	788
13	534	341	442	453	561	2000	600	1140	2110	532	458	582
14	1010	364	445	460	570	1360	571	1280	2340	809	317	449
15	798	919	457	468	579	1100	540	4280	2460	681	264	535
16	915	2290	464	479	584	1030	508	6760	2570	573	253	530
17	608	1580	445	491	579	1020	483	5880	2280	509	296	461
18	7780	1160	438	517	584	1360	479	5970	2010	465	270	379
19	5800	1640	434	504	598	1220	513	5580	1550	447	243	342
20	4050	1440	438	491	570	1010	713	4260	1250	443	222	620
21	3360	980	449	500	557	839	724	3460	1070	443	204	1480
22	3730	815	453	500	548	781	670	2530	975	417	201	1150
23	3240	686	442	483	534	660	579	2040	913	358	222	844
24	2090	584	449	472	539	639	513	1620	897	288	233	684
25	1520	539	460	479	534	608	472	1420	966	273	216	572
26	1430	690	442	479	517	589	442	1480	909	262	196	498
27	1160	600	445	453	513	570	420	1430	915	244	190	442
28	1020	474	442	442	508	543	524	1490	949	224	190	640
29	886	464	438	442	---	534	846	1330	898	211	193	730
30	775	578	427	449	---	534	714	1100	813	204	225	2860
31	703	---	431	431	---	508	---	1050	---	198	242	---
TOTAL	50604	21494	13941	14364	15265	25847	21487	61081	43567	14157	7544	19509
MEAN	1632	716	450	463	545	834	716	1970	1452	457	243	650
MAX	7780	2290	629	517	598	3120	2560	6760	2570	809	494	2860
MIN	388	341	427	431	460	453	420	357	813	198	182	232
AC-FT	100400	42630	27650	28490	30280	51270	42620	121200	86420	28080	14960	38700
CAL YR 1985	TOTAL	569399		MEAN	1560	MAX	16300	MIN	116	AC-FT	1129000	
WTR YR 1986	TOTAL	308860		MEAN	846	MAX	7780	MIN	182	AC-FT	612600	

## 07329000 RUSH CREEK AT PURDY, OK

LOCATION.--Lat 34°41'42", long 97°35'54", in SE 1/4 SE 1/4 sec.27, T.3 N., R.4 W., on left downstream bank near end of bridge on State Highway 76, 0.8 mi south of Purdy, 8.5 mi south of Lindsay, and at mile 27.3.

DRAINAGE AREA.--145 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1939 to December 1953, February 1982 to current year. Prior to May 1940 monthly discharges only, published in WSP 1311.

REVISED RECORD.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1004.12 ft, National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1942, nonrecording gage, at site 1.2 mi downstream, at datum 9.42 ft lower. Oct. 1, 1942 to Aug. 22, 1943, and May 11, 1950 to Sept. 18, 1952, nonrecording gage, 1.2 mi downstream, at datum 14.42 ft lower. Aug. 23, 1943 to May 10, 1950, and Sept. 19, 1952 to Dec. 31, 1953, water-stage recorder, at site 1.2 mi downstream, at datum 14.42 ft lower.

REMARKS.--Estimated daily discharges: Oct. 4-9, June 29 to July 7, 9-13, July 15 to Aug. 9, 11-21, 23-27, and Aug. 29 to Sept. 2, 8, 23-27. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--18 yrs (water years 1940-53, 1983-86), 53.6 ft<sup>3</sup>/s, 52,310 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,000 ft<sup>3</sup>/s, May 10, 1950, gage height, 27.00 ft, from floodmark, and from rating extended above 5,000 ft<sup>3</sup>/s on the basis of a slope-area measurement, at 27.00 ft. No flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft<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. 18	0715	*4,230	*19.40	No peak greater than base discharge.			
Minimum daily discharge, 4.3 ft <sup>3</sup> /s, Aug. 20.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	88	56	27	26	24	24	29	47	19	6.6	14
2	15	79	38	27	26	24	34	25	46	18	6.8	15
3	13	71	34	27	27	23	263	23	53	17	7.0	85
4	10	61	32	27	28	22	422	21	69	17	7.5	57
5	9.0	49	31	26	31	22	171	20	133	16	8.0	51
6	9.0	34	30	67	40	22	99	20	142	15	10	27
7	8.0	30	30	65	41	21	66	20	86	14	12	19
8	9.0	29	30	59	43	19	50	19	70	14	15	16
9	10	30	31	53	39	20	39	19	58	13	19	18
10	43	29	31	44	36	24	34	91	62	13	30	47
11	40	27	32	33	34	73	32	121	78	15	19	150
12	28	27	32	28	33	150	32	61	62	17	15	60
13	99	29	28	26	31	77	68	41	51	19	11	40
14	178	36	22	26	34	53	69	98	44	21	8.0	98
15	77	51	24	26	33	50	60	196	41	19	6.0	188
16	43	49	31	26	33	49	51	104	130	17	5.2	124
17	35	41	31	26	32	43	42	436	77	16	4.8	78
18	1860	48	31	27	31	260	33	241	58	14	4.5	51
19	818	85	30	26	30	115	52	156	47	13	4.4	39
20	521	60	29	25	29	71	81	105	40	11	4.3	32
21	321	46	29	26	27	54	53	74	36	9.5	4.4	28
22	179	40	30	24	26	43	40	61	32	9.0	4.4	23
23	121	37	30	23	25	37	34	52	29	8.0	4.5	20
24	148	35	30	24	25	32	30	47	28	7.0	5.5	17
25	153	34	28	25	24	29	27	60	28	6.8	8.0	15
26	169	34	27	24	25	28	25	63	26	6.5	12	14
27	137	34	28	23	25	27	27	59	25	6.5	19	15
28	131	33	27	23	25	25	28	52	24	6.4	22	18
29	111	31	28	24	---	25	25	45	21	6.2	15	31
30	106	36	29	23	---	24	28	46	20	6.4	12	169
31	96	---	29	25	---	25	---	50	---	6.4	13	---
TOTAL	5521.0	1313	948	955	859	1511	2039	2455	1663	396.7	323.9	1559
MEAN	178	43.8	30.6	30.8	30.7	48.7	68.0	79.2	55.4	12.8	10.4	52.0
MAX	1860	88	56	67	43	260	422	436	142	21	30	188
MIN	8.0	27	22	23	24	19	24	19	20	6.2	4.3	14
AC-FT	10950	2600	1880	1890	1700	3000	4040	4870	3300	787	642	3090

CAL YR 1985 TOTAL 60391.6 MEAN 165 MAX 2400 MIN 5.6 AC-FT 119800  
WTR YR 1986 TOTAL 19543.6 MEAN 53.5 MAX 1860 MIN 4.3 AC-FT 38760

## RED RIVER BASIN

273

07329700 WILDHORSE CREEK NEAR HOOVER, OK

LOCATION.--Lat 34°32'29", long 97°14'49", on west line of SW 1/4 sec.19, T.1 N., R.1 E., Garvin County, Hydrologic Unit 11130303, on downstream left bank at bridge on State Highway 19A, 1.5 mi north of Hoover, 1.8 mi downstream from Sandy Creek, and at mile 7.9.

DRAINAGE AREA.--604 mi<sup>2</sup>.

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1944, 1951-69. October 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is 803.3 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: July 21 to Aug. 19, and Aug. 29 to Sept. 30. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by Duncan, Clear Creek, Humphries and Fuqua Lakes, combined surface-area, 3,340 acres, and capacity, 44,800 acre-ft, and numerous flood-retarding structures.

AVERAGE DISCHARGE.--17 years, 160 ft<sup>3</sup>/s, 144,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,700 ft<sup>3</sup>/s, May 20, 1977, gage height, 24.70 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft<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. 18	1200	*13,400	*21.10	No other peaks greater than base discharge.			
Minimum daily discharge, 3.1 ft <sup>3</sup> /s, Aug. 25.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	274	480	73	57	71	68	78	139	33	6.1	6.0
2	34	235	247	70	59	62	83	109	117	31	6.0	100
3	25	203	190	69	64	57	303	102	132	29	6.0	235
4	21	180	140	68	72	55	989	81	276	27	6.0	80
5	18	166	123	71	79	54	553	70	613	24	5.8	45
6	17	150	107	78	112	53	406	60	716	23	7.0	35
7	16	131	100	66	115	57	308	60	375	22	6.0	28
8	15	117	95	62	106	54	256	57	282	21	7.0	27
9	15	107	93	67	104	54	223	56	219	19	11	28
10	17	99	95	62	93	67	181	133	178	18	16	50
11	23	93	116	60	89	105	161	211	219	17	12	170
12	31	89	134	52	89	667	154	109	171	16	8.0	92
13	31	83	111	58	85	256	145	77	126	15	5.0	89
14	194	82	93	63	83	176	123	70	101	13	3.5	100
15	144	84	112	63	94	169	131	1480	90	12	3.4	210
16	51	95	100	62	83	224	102	467	202	11	3.4	150
17	34	83	95	62	77	149	93	1040	551	10	3.5	80
18	6580	78	96	62	78	172	85	1130	217	9.3	3.7	50
19	3760	258	91	62	77	262	292	727	151	8.9	4.0	44
20	2080	206	91	64	75	203	492	478	110	8.7	4.3	33
21	1120	127	87	61	78	152	231	347	87	10	4.1	28
22	835	102	87	60	82	125	162	264	72	15	3.5	24
23	696	92	86	63	68	110	130	208	160	12	3.4	22
24	586	76	84	61	63	99	106	177	102	11	3.2	20
25	515	86	78	58	63	91	90	181	98	9.5	3.1	20
26	901	81	81	56	62	86	84	179	69	8.5	4.9	20
27	601	80	76	63	62	82	83	163	56	8.0	4.8	22
28	466	92	74	68	63	77	83	146	46	7.5	6.6	35
29	426	78	74	63	---	79	83	120	41	7.0	6.0	42
30	398	97	73	59	---	73	73	109	37	6.8	5.8	50
31	336	---	72	62	---	69	---	121	---	6.5	5.6	---
TOTAL	20044	3724	3581	1968	2232	4010	6273	8610	5753	469.7	178.7	1935.0
MEAN	647	124	116	63.5	79.7	129	209	278	192	15.2	5.76	64.5
MAX	6580	274	480	78	115	667	989	1480	716	33	16	235
MIN	15	76	72	52	57	53	68	56	37	6.5	3.1	6.0
AC-FT	39760	7390	7100	3900	4430	7950	12440	17080	11410	932	354	3840

CAL YR 1985 TOTAL 192734.1 MEAN 528 MAX 8010 MIN 5.5 AC-FT 382300  
WTR YR 1986 TOTAL 58778.3 MEAN 161 MAX 6580 MIN 3.1 AC-FT 116600

## RED RIVER BASIN

07329849 ANTELOPE SPRING AT SULPHUR, OK

LOCATION.--Lat 34°30'16", long 96°56'28", in NW 1/4 NE 1/4 sec.1, T.1 S., R.3E., Murray County, Hydrologic Unit 11130303, 10 ft downstream from spring in the Chickasaw National Park, 1.1 mi up the self-guiding nature trail from the nature center.

PERIOD OF RECORD.--November 20, 1985 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,080 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

EXTREMES FOR CURRENT PERIOD.--November 1985 to September 1986: Maximum daily discharge, 6.4 ft<sup>3</sup>/s, May 23-24, gage height, 0.64 ft; minimum daily discharge, 2.4 ft<sup>3</sup>/s, many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	4.0	5.8	5.2	4.3	2.4	4.0	4.3	4.7	3.0	2.4
2	---	---	4.3	5.8	5.2	4.3	2.7	3.6	4.3	4.7	3.0	2.4
3	---	---	4.7	5.8	5.2	4.3	2.7	3.6	4.3	4.7	3.0	2.4
4	---	---	4.7	5.8	5.8	4.3	2.7	3.6	4.3	4.7	3.0	2.7
5	---	---	4.7	5.8	5.8	4.3	2.7	4.0	4.3	4.7	3.0	3.0
6	---	---	4.7	5.8	5.8	4.0	2.4	4.0	4.3	4.7	3.0	3.0
7	---	---	5.2	5.8	5.8	4.3	2.4	4.0	4.3	4.7	3.0	3.0
8	---	---	5.2	5.8	5.8	4.7	2.4	4.0	4.3	4.7	3.0	3.3
9	---	---	5.2	5.8	5.8	4.3	2.4	4.0	4.3	4.7	3.0	3.3
10	---	---	5.2	5.8	5.8	4.3	2.4	4.0	4.3	4.7	3.3	3.3
11	---	---	5.2	5.8	5.8	4.3	2.4	4.0	4.3	4.7	3.6	3.0
12	---	---	5.2	5.8	5.8	4.3	2.4	4.0	4.3	4.3	3.6	3.0
13	---	---	5.2	5.8	5.8	4.3	2.4	4.0	4.3	4.3	3.6	3.0
14	---	---	5.2	5.8	5.8	4.3	2.4	4.0	4.3	4.0	3.6	3.0
15	---	---	5.2	5.8	5.8	4.3	2.4	4.0	4.3	4.0	3.6	3.0
16	---	---	5.2	5.8	5.8	4.3	2.7	4.3	4.3	3.6	3.6	3.0
17	---	---	5.2	5.8	5.2	4.3	2.7	4.7	4.3	3.6	3.6	3.0
18	---	---	5.2	5.8	5.8	4.3	3.6	4.7	4.3	3.6	3.6	3.0
19	---	---	5.2	5.2	5.8	4.3	3.6	5.2	4.3	3.6	3.6	3.0
20	---	3.3	5.2	5.2	5.8	4.3	3.6	5.8	4.3	4.0	3.6	3.0
21	---	3.6	5.2	5.2	5.8	5.2	3.3	5.8	4.3	4.0	3.6	3.0
22	---	3.6	5.2	5.2	5.8	4.3	3.3	5.8	4.7	4.0	3.0	3.0
23	---	3.6	5.2	4.7	4.7	4.0	3.3	6.4	4.7	4.0	2.7	3.0
24	---	3.6	5.8	4.7	4.7	3.0	3.6	6.4	4.7	4.0	2.7	3.0
25	---	3.6	5.8	4.7	4.7	3.0	3.6	5.8	4.7	4.0	3.0	2.7
26	---	4.0	5.8	4.7	4.7	3.0	3.6	4.7	4.7	3.6	3.0	2.7
27	---	4.0	5.8	4.3	4.3	2.7	3.6	4.3	4.7	3.3	2.7	2.7
28	---	4.0	5.8	4.7	4.3	2.4	3.6	4.3	4.7	3.3	2.7	2.7
29	---	4.0	5.8	4.7	---	2.4	4.0	4.3	4.7	3.3	2.4	2.7
30	---	4.0	5.8	4.7	---	2.4	4.0	4.3	4.7	3.0	2.4	2.7
31	---	---	5.8	4.7	---	2.4	---	4.3	---	3.0	2.4	---
TOTAL	---	---	161.9	167.1	152.6	120.9	89.3	139.9	132.6	126.2	96.9	87.0
MEAN	---	---	5.22	5.39	5.45	3.90	2.98	4.51	4.42	4.07	3.13	2.90
MAX	---	---	5.8	5.8	5.8	5.2	4.0	6.4	4.7	4.7	3.6	3.3
MIN	---	---	4.0	4.3	4.3	2.4	2.4	3.6	4.3	3.0	2.4	2.4
AC-FT	---	---	321	331	303	240	177	277	263	250	192	173

## RED RIVER BASIN

275

07329851 VENDOME WELL AT SULPHUR, OK

LOCATION.--Lat 34°30'21", long 96°58'19", in NW 1/4 NE 1/4 sec.3, T.1 S., R.3E., Murray County, Hydrologic Unit 11130303, .2 mi west and 300 ft south of intersection of State Highways 7 and 177, in Sulphur.

PERIOD OF RECORD.--November 20, 1985 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 950 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

EXTREMES FOR CURRENT PERIOD.--November 1985 to September 1986: Maximum daily discharge, 1.6 ft<sup>3</sup>/s, many days; minimum daily discharge, 0.80 ft<sup>3</sup>/s, Aug. 28-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	1.4	1.1	1.4	1.4	1.6	1.4	1.4	1.4	1.1	1.1
2	---	---	1.4	1.1	1.4	1.4	1.6	1.4	1.4	1.4	1.1	1.1
3	---	---	1.4	1.1	1.6	1.4	1.6	1.4	1.4	1.4	1.1	1.1
4	---	---	1.4	1.1	1.6	1.4	1.6	1.4	1.4	1.4	1.1	1.1
5	---	---	1.4	1.1	1.6	1.4	1.6	1.4	1.4	1.4	1.1	1.1
6	---	---	1.4	1.1	1.4	1.4	1.6	1.4	1.4	1.4	1.1	1.1
7	---	---	1.4	1.1	1.4	1.6	1.6	1.4	1.4	1.4	1.1	1.1
8	---	---	1.4	1.4	1.6	1.6	1.6	1.4	1.4	1.4	1.4	1.1
9	---	---	1.4	1.4	1.6	1.6	1.6	1.4	1.4	1.4	1.4	1.1
10	---	---	1.4	1.4	1.4	1.6	1.6	1.4	1.4	1.4	1.4	1.1
11	---	---	1.4	1.4	1.4	1.6	1.6	1.4	1.4	1.4	1.1	1.1
12	---	---	1.4	1.4	1.4	1.6	1.6	1.4	1.4	1.4	1.1	1.1
13	---	---	1.4	1.4	1.6	1.6	1.6	1.4	1.4	1.4	1.1	1.1
14	---	---	1.4	1.4	1.4	1.6	1.6	1.4	1.4	1.1	1.1	1.1
15	---	---	1.4	1.4	1.6	1.6	1.6	1.4	1.4	1.1	1.1	1.1
16	---	---	1.4	1.4	1.6	1.6	1.4	1.4	1.4	1.1	1.1	1.1
17	---	---	1.1	1.4	1.6	1.6	1.4	1.4	1.4	1.1	1.1	1.1
18	---	---	1.1	1.4	1.6	1.6	1.4	1.4	1.4	1.1	1.1	1.1
19	---	---	1.1	1.4	1.6	1.6	1.4	1.1	1.4	1.1	1.1	1.1
20	---	1.4	1.1	1.4	1.4	1.6	1.4	1.1	1.4	1.1	1.1	1.1
21	---	1.4	1.1	1.4	1.4	1.6	1.4	1.1	1.4	1.1	1.1	1.1
22	---	1.4	1.1	1.4	1.4	1.6	1.4	1.4	1.4	1.1	1.1	1.1
23	---	1.4	1.1	1.4	1.4	1.6	1.4	1.4	1.4	1.1	1.1	1.1
24	---	1.4	1.1	1.4	1.4	1.6	1.4	1.4	1.4	1.1	1.1	1.1
25	---	1.4	1.1	1.4	1.4	1.6	1.4	1.4	1.4	1.1	1.1	1.1
26	---	1.4	1.1	1.4	1.4	1.6	1.4	1.4	1.4	1.1	1.1	1.1
27	---	1.4	1.1	1.4	1.4	1.6	1.4	1.4	1.4	1.1	1.1	1.4
28	---	1.4	1.1	1.4	1.4	1.6	1.4	1.4	1.4	1.1	.80	1.4
29	---	1.4	1.1	1.4	---	1.6	1.4	1.4	1.4	1.1	.80	1.4
30	---	1.4	1.1	1.4	---	1.6	1.4	1.4	1.4	1.1	.80	1.4
31	---	---	1.1	1.4	---	1.6	---	1.4	---	1.1	1.1	---
TOTAL	---	---	38.9	41.3	41.4	48.4	45.0	42.5	42.0	38.0	34.10	34.2
MEAN	---	---	1.25	1.33	1.48	1.56	1.50	1.37	1.40	1.23	1.10	1.14
MAX	---	---	1.4	1.4	1.6	1.6	1.6	1.4	1.4	1.4	1.4	1.4
MIN	---	---	1.1	1.1	1.4	1.4	1.4	1.1	1.4	1.1	.80	1.1
AC-FT	---	---	77	82	82	96	89	84	83	75	68	68

## 07331000 WASHITA RIVER NEAR DICKSON, OK

LOCATION.--Lat 34°14'03", long 96°58'32", in NW 1/4 SW 1/4 sec.3, T.4 S., R.3 E., Carter County, Hydrologic Unit 11130303, near left bank on downstream side of bridge on U.S. Highway 177, 1.3 mi downstream from Caddo Creek, 3.2 mi north of Dickson, 12.0 mi northeast of Ardmore, and at mile 63.4.

DRAINAGE AREA.--7,202 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1928 to current year. Monthly discharge only for some periods, published in WSP 1311. Prior to Oct. 1, 1979, published as Washita River near Durwood.

REVISED RECORDS.--WSP 1211: Drainage area. WSP 1281: 1935(M).

GAGE.--Water-stage recorder. Datum of gage is 650.57 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Feb. 16, 1939, nonrecording gage, at same site and datum. Dec. 15, 1950 to Feb. 19, 1952, nonrecording gage, at site 500 ft upstream, at same datum. Apr. 24, 1975 to May 8, 1986, water-stage recorder, at site 500 ft upstream, at same datum.

REMARKS.--Estimated daily discharges: July 13, 14. Records fair. Some diversions above station for irrigation. Some regulation since March 1959 by Fort Cobb Reservoir (station 07325900), since February 1961 by Foss Reservoir (station 07324300), and by numerous flood-retarding structures.

AVERAGE DISCHARGE.--58 years, 1,470 ft<sup>3</sup>/s, 1,017,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 98,000 ft<sup>3</sup>/s, May 19, 1957, gage height, 42.30 ft, from floodmark; maximum gage height, 44.37 ft, Oct. 31, 1941; no flow Aug. 28, Sept. 14 to Oct. 1, 7-12, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 10,000 ft<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. 19	0445	*25,700	*25.89	May 17	2400	10,600	17.12

Minimum daily discharge, 216 ft<sup>3</sup>/s, Aug. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1150	1990	1090	804	654	679	695	1030	1490	1030	245	269
2	1590	1580	3030	771	655	680	692	1050	1560	961	250	287
3	1270	1250	1510	753	692	670	730	877	1360	877	241	271
4	1420	1140	1380	739	685	657	4380	837	3070	786	231	481
5	1720	938	1260	730	695	652	4490	768	3840	726	229	1300
6	1430	976	1170	723	941	640	2930	685	4810	697	228	1760
7	1120	932	1130	734	921	636	1970	624	3370	665	217	1410
8	967	827	1090	737	927	635	1620	578	2510	627	216	873
9	877	827	1040	740	916	615	1550	558	1990	593	264	762
10	818	777	1050	743	914	639	1450	592	1900	563	281	974
11	801	842	1480	741	938	656	1300	1370	1680	539	271	2380
12	799	853	1620	734	938	1430	1130	1710	2060	525	328	1620
13	832	832	1420	718	935	2770	1080	1890	2290	500	329	1270
14	951	787	1200	714	923	1880	1020	1600	2160	470	478	2570
15	1760	827	1090	708	911	1410	954	6090	2570	645	442	2420
16	1420	1160	1070	704	918	1360	884	7720	2470	778	356	1480
17	1350	2590	1030	704	934	1300	780	9530	5570	674	320	1270
18	9740	2140	997	702	926	1250	745	10100	3680	590	289	1020
19	21100	1710	971	709	911	1700	2080	9440	2880	539	287	988
20	12300	2980	961	716	890	1620	2470	7380	2260	490	285	812
21	7960	2010	942	722	866	1360	1700	5980	1930	482	264	681
22	6880	1400	925	716	778	1220	1480	5050	1640	475	246	1560
23	6290	1380	915	702	753	1050	1290	4050	1440	448	232	1220
24	4930	1290	909	695	730	948	1130	3460	1510	408	228	1070
25	3530	1270	904	693	706	889	1000	3850	1340	385	242	904
26	3140	1250	896	685	704	844	904	3210	1290	359	251	778
27	3070	1240	886	679	699	810	848	2760	1280	333	252	688
28	2380	1340	844	672	688	770	814	2500	1150	314	253	643
29	2370	1200	823	672	---	744	717	2280	1180	297	228	579
30	2150	1130	812	662	---	725	894	1730	1150	275	276	912
31	2050	---	812	652	---	706	---	1480	---	253	244	---
TOTAL	108165	39468	35257	22174	23148	31945	43727	100779	67430	17304	8503	33252
MEAN	3489	1316	1137	715	827	1030	1458	3251	2248	558	274	1108
MAX	21100	2980	3030	804	941	2770	4490	10100	5570	1030	478	2570
MIN	799	777	812	652	654	615	692	558	1150	253	216	269
AC-FT	214500	78280	69930	43980	45910	63360	86730	199900	133700	34320	16870	65960

CAL YR 1985 TOTAL 1126640 MEAN 3087 MAX 32100 MIN 267 AC-FT 2235000  
WTR YR 1986 TOTAL 531152 MEAN 1455 MAX 21100 MIN 216 AC-FT 1054000



07331000 WASHITA RIVER NEAR DICKSON, OK--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1944 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 1944 to January 1982, February 1984 to current year.

WATER TEMPERATURE: April 1947 to January 1982, February 1984 to current year.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,120 microsiemens, Nov. 15, 1963; minimum daily, 95 microsiemens, Nov. 2, 1951.

WATER TEMPERATURE: Maximum daily, 38.0 °C, July 16, 1985; minimum daily, 0.0 °C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,690 microsiemens, July 18; minimum daily, 299 microsiemens, Oct. 19.

WATER TEMPERATURE: Maximum daily, 36.0 °C, July 20, 30; minimum daily, 3.0 °C, Dec. 13.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)
OCT											
19...	1400	1028	1028	23.85	21700	245	7.50	--	19.5	--	--
30...	1100	1028	1028	9.33	2130	6190	7.70	21.5	15.0	--	--
NOV											
18...	1400	1028	80020	9.07	2010	920	7.00	10.5	19.0	170	740
DEC											
18...	1100	1028	1028	8.07	1010	1120	8.50	-5.0	3.5	--	--
JAN											
22...	1545	1028	80020	7.36	747	1520	8.22	16.0	11.5	5.7	753
FEB											
25...	1530	1028	1028	7.33	701	1490	8.40	19.5	14.0	--	--
MAR											
24...	1830	1028	80020	8.08	827	1200	8.63	25.0	16.5	34	748
APR											
16...	1430	1028	1028	8.06	827	1200	8.30	25.0	20.5	--	--
MAY											
21...	1400	1028	80020	13.45	6020	665	7.65	27.0	22.0	400	739
JUN											
25...	1230	1028	1028	8.83	1300	790	8.00	34.0	30.5	--	--
JUL											
24...	1100	1028	80020	7.06	419	1140	7.67	36.5	29.5	22	749
AUG											
20...	1150	1028	1028	6.71	276	1280	7.80	38.0	30.0	--	--
SEP											
23...	1600	1028	80020	9.06	1270	1030	7.42	88.0	28.5	900	739
DATE		OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI, KF AGAR (COLS./PER 100 ML)	HARD-NESS (MG/L AS CAC03)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO
OCT											
19...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
NOV											
18...	9.1	101	--	--	370	220	93	32	40	19	0.9
DEC											
18...	--	--	--	--	--	--	--	--	--	--	--
JAN											
22...	9.6	89	120	180	620	370	140	66	82	22	1
FEB											
25...	--	--	--	--	--	--	--	--	--	--	--
MAR											
24...	9.2	97	K58	K18	490	290	110	52	70	24	1
APR											
16...	--	--	--	--	--	--	--	--	--	--	--
MAY											
21...	8.1	96	K160	--	260	130	69	20	25	17	0.7
JUN											
25...	--	--	--	--	--	--	--	--	--	--	--
JUL											
24...	8.1	109	40	81	440	270	98	47	61	23	1
AUG											
20...	--	--	--	--	--	--	--	--	--	--	--
SEP											
23...	8.0	107	--	--	400	260	100	35	89	33	2

## RED RIVER BASIN

07331000 WASHITA RIVER NEAR DICKSON, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
OCT											
19...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
NOV											
18...	4.3	--	--	--	28	210	45	0.30	8.4	568	530
DEC											
18...	--	--	--	--	--	--	--	--	--	--	--
JAN											
22...	3.0	--	--	--	2.9	430	110	0.40	7.1	1010	990
FEB											
25...	--	--	--	--	--	--	--	--	--	--	--
MAR											
24...	4.1	--	--	--	0.9	340	81	0.40	3.5	822	780
APR											
16...	--	--	--	--	--	--	--	--	--	--	--
MAY											
21...	5.2	--	--	--	5.5	140	25	0.20	7.7	514	370
JUN											
25...	--	--	--	--	--	--	--	--	--	--	--
JUL											
24...	6.1	--	--	--	6.8	330	62	0.30	8.5	749	710
AUG											
20...	--	--	--	--	--	--	--	--	--	--	--
SEP											
23...	6.3	166	0	136	10	310	--	0.30	11	664	--
DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	
OCT											
19...	--	--	--	--	--	--	--	--	--	--	
30...	--	--	--	--	--	--	--	--	--	--	
NOV											
18...	0.77	3080	0.760	3.4	0.020	0.07	0.780	0.130	0.350	0.45	
DEC											
18...	--	--	--	--	--	--	--	--	--	--	
JAN											
22...	1.4	2040	0.250	1.1	0.010	0.03	0.260	0.150	0.090	0.12	
FEB											
25...	--	--	--	--	--	--	--	--	--	--	
MAR											
24...	1.1	1840	--	--	0.021	0.07	<0.100	0.071	0.100	0.13	
APR											
16...	--	--	--	--	--	--	--	--	--	--	
MAY											
21...	0.70	8350	0.560	--	0.010	0.03	0.570	0.100	0.090	0.12	
JUN											
25...	--	--	--	--	--	--	--	--	--	--	
JUL											
24...	1.0	847	--	--	<0.010	--	<0.100	0.050	0.070	0.09	
AUG											
20...	--	--	--	--	--	--	--	--	--	--	
SEP											
23...	--	--	--	--	<0.010	--	1.90	0.350	0.080	0.10	

## RED RIVER BASIN

07331000 WASHITA RIVER NEAR DICKSON, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS P04)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
OCT 19...	--	--	--	--	--	--	--	--	--	--
OCT 30...	--	--	--	--	--	--	--	--	--	--
NOV 18...	0.47	0.60	0.060	0.18	0.060	0.040	0.12	30	2	190
DEC 18...	--	--	--	--	--	--	--	--	--	--
JAN 22...	0.95	1.1	0.080	0.25	0.020	0.020	0.06	--	--	--
FEB 25...	--	--	--	--	--	--	--	--	--	--
MAR 24...	0.83	0.90	0.141	--	0.031	0.021	0.06	10	1	200
APR 16...	--	--	--	--	--	--	--	--	--	--
MAY 21...	1.0	1.1	0.290	--	0.060	0.040	0.12	130	1	140
JUN 25...	--	--	--	--	--	--	--	--	--	--
JUL 24...	0.85	0.90	0.140	--	0.060	0.020	0.06	--	--	--
AUG 20...	--	--	--	--	--	--	--	--	--	--
SEP 23...	0.75	1.1	0.850	--	0.090	0.050	0.15	60	3	210
DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
OCT 19...	--	--	--	--	--	--	--	--	--	--
OCT 30...	--	--	--	--	--	--	--	--	--	--
NOV 18...	<0.5	<1	<1	<3	3	17	2	17	8	<0.1
DEC 18...	--	--	--	--	--	--	--	--	--	--
JAN 22...	--	--	--	--	--	--	--	--	--	--
FEB 25...	--	--	--	--	--	--	--	--	--	--
MAR 24...	<0.5	5	3	<3	7	4	3	22	15	<0.1
APR 16...	--	--	--	--	--	--	--	--	--	--
MAY 21...	<0.5	<1	<1	<3	3	84	6	11	5	1.5
JUN 25...	--	--	--	--	--	--	--	--	--	--
JUL 24...	--	--	--	--	--	--	--	--	--	--
AUG 20...	--	--	--	--	--	--	--	--	--	--
SEP 23...	<0.5	2	4	<3	16	67	12	15	8	0.3

07331000 WASHITA RIVER NEAR DICKSON, OK--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT										
19...	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	1270	7300	61
NOV										
18...	<10	3	<1	<1	890	6	75	1520	8250	97
DEC										
18...	--	--	--	--	--	--	--	122	333	84
JAN										
22...	--	--	--	--	--	--	--	91	184	20
FEB										
25...	--	--	--	--	--	--	--	--	--	--
MAR										
24...	<10	3	1	<1	1300	<6	12	138	308	86
APR										
16...	--	--	--	--	--	--	--	--	--	--
MAY										
21...	<10	2	<1	<1	590	<6	30	3800	61800	97
JUN										
25...	--	--	--	--	--	--	--	--	--	--
JUL										
24...	--	--	--	--	--	--	--	386	437	75
AUG										
20...	--	--	--	--	--	--	--	--	--	--
SEP										
23...	<10	3	<1	<1	1000	11	32	2680	9190	82

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1000	696	1030	1400	1490	1480	1260	1340	843	1240	1220	1200
2	920	769	690	1440	1500	1470	1270	960	902	1210	1220	1310
3	964	858	932	1470	1450	1470	1260	1100	960	1230	1200	1390
4	926	892	981	1390	1480	1480	491	1290	636	1200	1190	1140
5	1180	941	1100	1470	1470	1470	635	1280	706	1200	1220	698
6	704	986	1170	1310	1230	1480	612	1270	672	1200	1240	860
7	600	1080	1200	1470	1380	1450	683	1350	471	---	---	707
8	575	1090	1240	1520	1390	1400	772	1260	576	---	1300	639
9	602	1080	1280	---	1310	1440	592	1380	680	---	1300	967
10	696	1140	1300	1300	1410	1400	866	1170	855	---	1270	1240
11	767	1190	1160	1470	1370	1390	949	1060	927	---	1030	---
12	---	1180	1000	1510	1240	1400	1020	919	1050	1280	1240	521
13	1020	1180	940	1510	1200	668	1080	722	832	1270	1240	699
14	938	1200	1080	1520	1320	842	1100	815	844	1250	1300	1340
15	876	1200	1220	1520	1350	932	1150	389	1020	1370	1360	492
16	586	1220	1170	1510	1210	846	1170	446	747	1590	985	472
17	655	1080	1280	1500	1340	1000	1160	441	521	1680	1230	636
18	410	848	1300	1490	1230	955	1160	484	650	1690	1040	595
19	299	714	1330	1480	1200	1080	728	520	727	1170	1070	693
20	405	750	1320	1480	1250	944	812	554	751	1010	1200	780
21	415	886	1340	1470	1310	889	833	545	775	994	1300	816
22	525	1010	1330	1430	1460	1000	857	640	874	1060	1320	1210
23	509	1110	1300	1440	1450	1140	883	689	922	1090	1280	917
24	446	930	1350	1480	1460	1190	963	640	887	1120	1300	684
25	483	967	1370	1460	1440	1140	1020	657	957	1180	1330	710
26	525	1070	1320	1530	1430	1160	1040	584	962	1200	1540	738
27	528	1010	1370	1530	1460	1180	1090	728	1100	1240	1510	777
28	616	962	1380	1530	---	1160	1140	741	1050	1240	1530	771
29	552	1130	1420	1500	---	1190	1130	744	1130	1250	1380	840
30	616	1170	1450	1510	---	1210	1250	903	1200	1270	1200	932
31	660	---	1460	1500	---	1260	---	889	---	1260	1470	---
MEAN	667	1010	1220	1470	1360	1200	966	855	841	1250	1270	854
WTR YR 1986		MEAN	1080	MAX	1690	MIN	299					

## RED RIVER BASIN

281

07331000 WASHITA RIVER NEAR DICKSON, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19.0	16.0	---	11.0	15.0	15.0	21.0	23.0	23.0	31.0	35.0	23.0
2	17.0	15.0	8.0	10.0	17.0	16.0	20.0	24.0	27.0	32.0	32.0	27.0
3	21.0	16.0	5.0	9.0	17.0	13.0	19.0	25.0	27.0	33.0	31.0	27.0
4	21.0	16.0	---	8.0	17.0	16.0	19.0	25.0	24.0	33.0	32.0	26.0
5	17.0	19.0	10.0	8.0	17.0	17.0	21.0	23.0	26.0	32.0	28.0	25.0
6	20.0	17.0	11.0	10.0	13.0	17.0	24.0	26.0	28.0	31.0	28.0	25.0
7	20.0	16.0	12.0	5.0	9.0	18.0	22.0	25.0	23.0	---	---	27.0
8	22.0	16.0	12.0	9.0	5.0	20.0	20.0	25.0	29.0	---	29.0	23.0
9	22.0	20.0	14.0	---	5.0	22.0	---	27.0	30.0	---	33.0	27.0
10	22.0	16.0	13.0	7.0	6.0	20.0	20.0	27.0	29.0	---	32.0	27.0
11	19.0	14.0	8.0	9.0	4.0	15.0	18.0	27.0	28.0	---	30.0	---
12	---	19.0	10.0	8.0	3.0	18.0	21.0	28.0	30.0	31.0	31.0	---
13	26.0	21.0	3.0	11.0	5.0	14.0	23.0	28.0	28.0	31.0	32.0	25.0
14	22.0	18.0	7.0	11.0	6.0	14.0	22.0	25.0	25.0	33.0	32.0	27.0
15	21.0	15.0	7.0	11.0	8.0	16.0	21.0	23.0	28.0	31.0	28.0	26.0
16	22.0	16.0	7.0	12.0	10.0	18.0	21.0	24.0	25.0	33.0	30.0	27.0
17	20.0	15.0	10.0	15.0	15.0	18.0	20.0	20.0	27.0	33.0	32.0	29.0
18	20.0	16.0	10.0	16.0	14.0	18.0	22.0	19.0	27.0	33.0	34.0	29.0
19	20.0	18.0	10.0	14.0	18.0	15.0	19.0	19.0	31.0	35.0	33.0	30.0
20	20.0	14.0	7.0	16.0	15.0	16.0	21.0	22.0	32.0	36.0	33.0	29.0
21	21.0	11.0	8.0	15.0	12.0	15.0	20.0	24.0	32.0	31.0	31.0	30.0
22	21.0	12.0	9.0	12.0	13.0	17.0	21.0	24.0	32.0	34.0	32.0	29.0
23	21.0	12.0	10.0	12.0	15.0	20.0	21.0	25.0	32.0	34.0	31.0	29.0
24	23.0	13.0	10.0	12.0	12.0	19.0	25.0	23.0	32.0	34.0	32.0	29.0
25	24.0	14.0	5.0	13.0	17.0	20.0	25.0	24.0	32.0	34.0	31.0	28.0
26	21.0	14.0	10.0	11.0	20.0	19.0	25.0	23.0	32.0	34.0	32.0	28.0
27	---	8.0	8.0	14.0	17.0	21.0	24.0	23.0	33.0	35.0	27.0	29.0
28	21.0	10.0	8.0	13.0	---	25.0	23.0	25.0	30.0	35.0	28.0	30.0
29	17.0	10.0	10.0	11.0	---	22.0	20.0	26.0	33.0	35.0	27.0	29.0
30	16.0	11.0	11.0	13.0	---	23.0	23.0	26.0	31.0	36.0	27.0	26.0
31	16.0	---	10.0	13.5	---	24.0	---	25.0	---	35.0	23.0	---
MEAN	20.5	15.0	9.0	11.5	12.0	18.0	21.5	24.5	29.0	33.5	30.5	27.5
WTR YR 1986	MEAN	21.0	MAX	36.0	MIN	3.0						

## 07331500 LAKE TEXOMA NEAR DENISON, TX

LOCATION.--Lat 33°49'05", long 96°34'20", in NE 1/4 sec.33, T.8 S., R.7 E., Bryan County, OK, Hydrologic Unit 11130210, in control tower of Denison Dam on Red River, 1.2 mi upstream from Shawnee Creek, 1.8 mi upstream from Sand Creek, 4.0 mi northwest of Denison, 6.0 mi southwest of Colbert, and at mile 725.9.

DRAINAGE AREA.--39,719 mi<sup>2</sup> of which 5,936 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--July 1942 to current year. Month-end contents only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929. Prior to Mar. 30, 1944, nonrecording gage at same site and datum. Prior to Oct. 1, 1948, supplementary nonrecording gage in Cumberland pool at the same datum.

REMARKS.--Reservoir is formed by a rolled earthfill dam. The controlled outlet consists of eight 20-foot diameter conduits and the uncontrolled outlet is a concrete, ogee-type weir spillway. Flow was diverted through conduits July 27, 1942; regulated storage began Oct. 31, 1943; power pool was first filled March 15, 1945. Capacity, based on 1969 survey, 5,312,000 acre-ft, at elevation 640.0 ft, crest of spillway, 2,643,000 acre-ft at elevation 617.0 ft maximum power pool; 1,031,000 acre-ft at elevation 590.0 ft, minimum power pool, in Denison pool. Dead storage, 11,000 acre-ft, at elevation 610.0 ft in Cumberland pool. When contents are below 2,103,000 acre-ft, the reservoir is divided into two pools by protective levees around the Cumberland oil field on the Washita River arm with bottom outlet channel for the upper pool (known as Cumberland pool) at elevation 610 ft. At higher elevations the two pools are considered as being at a common level, contents being computed from gage in Denison pool. Figures given herein represent total contents of both pools. Reservoir is used principally for flood control and power development. Revised capacity table, based on survey in 1969, used since Oct. 1, 1977.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 5,991,300 acre-ft, June 5, 1957, elevation, 643.18 ft. Minimum contents since power pool was first filled, 1,565,100 acre-ft, Sept. 16, 1964; minimum elevation, 599.96 ft, Mar. 1, 2, 1957.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 2,811,000 acre-ft, June 7, 8, 19, elevation, 618.84 ft. Minimum, 2,328,000 acre-ft, Oct. 2, elevation 613.07 ft.

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

610	2,105,000	622	3,117,000
614	2,399,000	627	3,649,000
617	2,643,000	632	4,240,000

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2329000	2782000	2557000	2546000	2510000	2568000	2580000	2624000	2729000	2670000	2472000	2338000
2	2329000	2770000	2546000	2546000	2521000	2571000	2578000	2615000	2730000	2666000	2465000	2335000
3	2338000	2757000	2546000	2543000	2536000	2570000	2614000	2602000	2730000	2651000	2456000	2335000
4	2352000	2742000	2550000	2542000	2539000	2570000	2635000	2590000	2752000	2642000	2450000	2354000
5	2361000	2722000	2549000	2538000	2557000	2569000	2629000	2578000	2779000	2630000	2441000	2387000
6	2368000	2717000	2548000	2532000	2569000	2569000	2618000	2576000	2798000	2621000	2435000	2450000
7	2374000	2704000	2548000	2529000	2572000	2568000	2611000	2572000	2811000	2613000	2429000	2527000
8	2376000	2692000	2548000	2522000	2568000	2565000	2610000	2567000	2807000	2611000	2423000	2582000
9	2380000	2692000	2548000	2518000	2566000	2568000	2604000	2582000	2796000	2607000	2416000	2615000
10	2382000	2692000	2554000	2517000	2565000	2574000	2597000	2582000	2786000	2600000	2412000	2632000
11	2378000	2680000	2546000	2518000	2559000	2578000	2591000	2585000	2776000	2594000	2404000	2643000
12	2374000	2670000	2548000	2522000	2557000	2578000	2585000	2584000	2762000	2588000	2399000	2649000
13	2372000	2660000	2541000	2521000	2553000	2581000	2578000	2585000	2754000	2582000	2391000	2653000
14	2380000	2660000	2536000	2521000	2558000	2582000	2571000	2583000	2754000	2575000	2383000	2660000
15	2388000	2636000	2535000	2518000	2560000	2584000	2565000	2601000	2752000	2567000	2381000	2664000
16	2397000	2619000	2534000	2519000	2565000	2586000	2560000	2609000	2777000	2560000	2380000	2665000
17	2411000	2604000	2533000	2520000	2566000	2584000	2554000	2636000	2792000	2555000	2375000	2675000
18	2449000	2600000	2532000	2524000	2568000	2597000	2561000	2663000	2807000	2550000	2371000	2682000
19	2494000	2601000	2532000	2525000	2571000	2584000	2658000	2674000	2811000	2550000	2367000	2686000
20	2565000	2594000	2530000	2525000	2578000	2578000	2677000	2692000	2805000	2551000	2363000	2690000
21	2663000	2592000	2529000	2527000	2573000	2573000	2688000	2714000	2794000	2545000	2361000	2689000
22	2750000	2586000	2531000	2521000	2572000	2576000	2688000	2726000	2774000	2542000	2358000	2689000
23	2784000	2583000	2538000	2515000	2576000	2582000	2682000	2731000	2751000	2535000	2357000	2680000
24	2797000	2575000	2539000	2514000	2573000	2580000	2682000	2728000	2734000	2529000	2357000	2665000
25	2802000	2564000	2534000	2514000	2576000	2576000	2672000	2727000	2717000	2522000	2353000	2654000
26	2802000	2566000	2533000	2515000	2580000	2577000	2656000	2722000	2709000	2517000	2349000	2642000
27	2798000	2572000	2531000	2506000	2580000	2577000	2643000	2714000	2700000	2509000	2347000	2639000
28	2796000	2565000	2534000	2509000	2572000	2576000	2625000	2706000	2690000	2502000	2340000	2639000
29	2810000	2557000	2538000	2507000	---	2578000	2613000	2709000	2683000	2497000	2338000	2632000
30	2804000	2566000	2542000	2506000	---	2578000	2615000	2715000	2674000	2490000	2337000	2629000
31	2793000	---	2544000	2506000	---	2581000	---	2718000	---	2483000	2335000	---
MAX	2810000	2782000	2557000	2546000	2580000	2597000	2688000	2731000	2811000	2670000	2472000	2690000
MIN	2329000	2557000	2529000	2506000	2510000	2565000	2554000	2567000	2674000	2483000	2335000	2335000
(†)	618.65	616.11	615.84	615.37	616.17	616.28	616.67	617.84	617.35	615.08	613.19	616.84
(††)	+464,000	-227,000	-22,000	-38,000	+66,000	+9,000	+34,000	+103,000	-44,000	-191,000	-148,000	+294,000
CAL YR 1985	MAX	3414000	MIN	2319000	††	-150,000						
WTR YR 1986	MAX	2811000	MIN	2329000	††	+306,000						

(†) ELEVATION, IN FEET, AT END OF MONTH

(††) CHANGE IN CONTENTS, IN ACRE-Feet



## 07331600 RED RIVER AT DENISON DAM NEAR DENISON, TX

LOCATION.--Lat 33°49'08", long 96°33'47", Grayson County, Hydrologic Unit 11140101, on right bank 1,800 ft downstream from Denison Dam powerhouse, 0.4 mi upstream from Shawnee Creek (spillway flow return), 4.5 mi north of Denison, and at mile 725.5.

DRAINAGE AREA.--39,720 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> is probably noncontributing. At site used prior to October 1961, drainage area was 39,777 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> probably was noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1923 to current year. Monthly discharge only for some periods, published in WSP 1311. Prior to October 1934, published as "near Denison, TX", and October 1934 to September 1961, published as "near Colbert, OK". Gage-height records collected at various sites in this vicinity 1892-93, 1906-28, 1931-49 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 807: 1935 (M). WSP 1211: Drainage area. WSP 1241: 1924-29, 1932-33, 1934 (M), 1935.

GAGE.--Water-stage recorder. Datum of gage is 500.00 ft, National Geodetic Vertical Datum of 1929. Oct. 9, 1923 to Sept. 24, 1934, nonrecording gage, and July 29, 1942 to Sept. 30, 1961, water-stage recorder, at county road bridge 2.5 mi downstream. Prior to Oct. 1, 1931, at datum 6.85 ft higher; Oct. 1, 1931 to Sept. 24, 1934, at datum 7.07 ft higher; and July 29, 1942 to Sept. 30, 1961, at datum 2.64 ft lower; Sept. 25, 1934 to July 28, 1942, water-stage recorder at railway bridge 1.9 mi downstream, at datum 7.36 ft higher.

REMARKS.--Estimated daily discharges: Nov. 8, Jan. 20-27, Feb. 6, and Mar. 31 to Apr. 13, May 10. Records good. Flow regulated since October 1943 by Lake Texoma (station 07331500).

COOPERATION.--Gage-height record and 4 discharge measurements furnished by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--Prior to regulation by Denison Dam, 20 years (water years 1924-43), 5,684 ft<sup>3</sup>/s, 4,118,000 acre-ft/yr; since regulation by Denison Dam, 42 years (water years 1945-86), 4,448 ft<sup>3</sup>/s, 3,223,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 201,000 ft<sup>3</sup>/s, May 21, 1935, gage height, 31.8 ft, at site and datum then in use; maximum gage height, 32.0 ft, Apr. 25, 1942, at site and datum used in 1943; minimum daily discharge, 12 ft<sup>3</sup>/s, Jan. 10, 1944.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 26, 1908, reached a stage of 45.5 ft, at site and datum used July 29, 1942 to Sept. 30, 1961; from record of National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17,000 ft<sup>3</sup>/s, June 9, gage height, 10.31 ft; minimum daily, 69 ft<sup>3</sup>/s, Aug. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	84	9310	4140	76	88	1540	1830	5890	10300	6300	4010	79
2	82	9320	5110	2980	82	1100	1760	6330	10300	5660	3400	1500
3	81	9310	2890	2820	1440	1390	1530	6550	10400	6030	3400	1500
4	80	9330	1810	2870	1810	1320	4840	7020	10500	5430	3180	1530
5	81	9360	1750	2960	1500	1460	8270	7040	10600	5310	3210	2630
6	81	6570	2740	3260	1600	95	8360	3950	10200	5680	2740	161
7	77	3250	1800	4220	2730	1560	6350	2750	13100	5700	2810	79
8	1200	5230	1790	4260	2570	892	5560	3800	16900	3800	2810	4390
9	1330	3660	1780	3040	2690	225	5580	2470	16900	3810	2820	5910
10	1520	3020	2830	1920	2970	1010	5570	2250	15400	3820	2780	5840
11	2740	5520	4280	85	3390	1130	5560	2050	13500	3810	3570	5800
12	2810	6170	3010	85	1920	1070	5580	2400	13500	3810	3190	5840
13	1810	6180	3150	1660	1490	2510	5540	2400	12500	3740	3100	5850
14	1410	6080	2170	1660	1450	2460	5540	2860	10300	3810	3060	5850
15	1370	8360	4140	1670	101	2530	3990	2850	10200	3800	3080	6060
16	1350	8360	2950	1650	91	190	3220	5260	10400	3780	1210	6720
17	2420	8360	2570	1470	1460	3150	1760	5530	10300	3190	2570	6840
18	4690	8410	1770	74	1430	3190	1730	5510	10200	3030	1960	7410
19	8690	6310	1780	71	96	5380	2200	6080	12000	163	1860	7400
20	8500	5790	1760	1800	83	5420	1340	7840	16000	78	1930	7380
21	9140	5940	1740	1820	2170	3250	3210	7820	16000	2920	469	7380
22	9460	5930	1960	3580	1660	195	5400	7070	16000	3010	1150	7380
23	9410	5920	2700	3840	648	75	5400	10400	16000	2790	92	9980
24	9400	5950	76	2160	1430	3210	5410	10400	13400	3000	69	9980
25	9370	5950	79	2080	90	3140	5910	10400	10200	3000	1490	9980
26	9360	5300	4190	1520	643	1780	9240	10400	7640	2960	1540	9980
27	9340	5020	1800	2210	1740	1410	9270	10400	6890	2980	1500	5740
28	9320	5050	80	72	2460	952	8380	10400	6040	3170	1550	5020
29	9490	5080	78	1400	---	92	6320	10400	6050	3010	114	5080
30	9290	5030	1710	1100	---	72	5740	10400	6800	2470	78	5070
31	9310	---	82	1170	---	1820	---	10400	---	3170	77	---
TOTAL	143296	193070	68715	59583	39832	53618	150390	199320	348520	113231	64819	164359
MEAN	4622	6436	2217	1922	1423	1730	5013	6430	11620	3653	2091	5479
MAX	9490	9360	5110	4260	3390	5420	9270	10400	16900	6300	4010	9980
MIN	77	3020	76	71	82	72	1340	2050	6040	78	69	79
AC-FT	284200	383000	136300	118200	79010	106400	298300	395400	691300	224600	128600	326000
CAL YR 1985 TOTAL	3602697			MEAN	9870	MAX	45900	MIN	72	AC-FT	7146000	
WTR YR 1986 TOTAL	1598753			MEAN	4380	MAX	16900	MIN	69	AC-FT	3171000	

07331600 RED RIVER AT DENISON DAM NEAR DENISON, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: May 1944 to current year. Chemical and biochemical analyses: October 1974 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 1944 to current year.

WATER TEMPERATURES: October 1945 to current year.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District office upon request.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 3,520 microsiemens, Aug. 14, 1944; minimum daily, 656 microsiemens, Oct. 16, 1945.

WATER TEMPERATURES (1945-69): Maximum daily, 31.0 °C, July 17, 1969; minimum daily, 3.0 °C, Feb. 2-4, 7, 1966.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,730 microsiemens, Sept. 18; minimum daily, 1,200 microsiemens on several days during October.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS./ PER 100 ML)	HARD- NESS (MG/L AS CAC03)
DEC 03...	1445	2890	1370	8.20	12.0	3.3	10.8	103	0.8	K4	K3	290
JAN 14...	1430	1660	1380	8.40	10.5	2.0	15.9	144	1.5	K1	K1	280
APR 14...	1450	5540	1530	8.20	16.5	1.0	10.5	109	1.4	K2	K13	320
JUN 03...	1515	10400	1490	8.10	21.0	2.7	7.1	81	1.0	46	410	330
JUL 22...	1415	3010	1470	7.70	24.0	--	3.0	37	1.1	--	350	320
SEP 09...	1320	5910	1480	7.80	25.5	2.0	5.7	71	1.0	K4700	K4100	300
DATE	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WH WAT TOTAL FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
DEC 03...	170	76	24	170	5	5.3	115	160	270	0.3	1.4	790
JAN 14...	170	74	23	170	5	5.5	112	180	280	0.3	2.3	825
APR 14...	190	83	26	180	5	4.8	128	200	290	0.3	3.2	890
JUN 03...	200	87	27	170	4	4.9	133	180	270	0.3	2.3	868
JUL 22...	190	83	27	180	5	4.7	128	170	270	0.3	4.6	873
SEP 09...	180	77	25	180	5	5.3	117	180	280	0.3	4.8	887
DATE	SOLIDS, SUM OF CONSTITU- ENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	SEDI- MENT, SUS- PENDED (MG/L)
DEC 03...	780	<0.01	0.26	0.04	0.04	0.46	0.5	0.03	0.02	0.02	0.06	5
JAN 14...	800	<0.01	0.25	0.03	0.06	0.57	0.6	0.03	0.02	0.02	0.06	3
APR 14...	870	<0.01	0.20	0.10	0.08	0.3	0.4	<0.01	0.02	<0.01	--	6
JUN 03...	820	<0.01	0.20	0.06	0.06	0.34	0.4	0.02	<0.01	<0.01	--	18
JUL 22...	820	0.02	<0.10	0.13	0.11	0.37	0.5	0.06	0.03	0.03	0.09	16
SEP 09...	820	0.03	<0.10	0.14	0.14	0.46	0.6	0.06	0.04	0.03	0.09	12

07331600 RED RIVER AT DENISON DAM NEAR DENISON, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)
DEC 03...	39	88	20	1	150	0.5	<1	<1	<3	<1	5
JAN 14...	13	77	--	--	--	--	--	--	--	--	--
APR 14...	90	86	10	1	140	2	1	1	<3	1	5
JUN 03...	505	95	--	--	--	--	--	--	--	--	--
JUL 22...	130	99	20	3	140	0.9	3	<1	<3	1	6
SEP 09...	191	96	--	--	--	--	--	--	--	--	--
DATE	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
DEC 03...	1	16	3	0.2	<10	<1	<1	<1	950	<6	12
JAN 14...	--	--	--	--	--	--	--	--	--	--	--
APR 14...	1	21	2	0.1	<10	1	<1	<1	920	<6	16
JUN 03...	--	--	--	--	--	--	--	--	--	--	--
JUL 22...	<5	19	160	<0.1	<10	2	<1	<1	950	<6	23
SEP 09...	--	--	--	--	--	--	--	--	--	--	--

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1985 TO SEPTEMBER 1986

MONTH	YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (US/CM)	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.	1985	143296	1370	783	303000	270	103700	180	69800	310
NOV.	1985	193070	1320	753	392000	260	134200	170	90300	300
DEC.	1985	68715	1380	789	146000	270	50000	180	33700	310
JAN.	1986	59583	1490	857	138000	290	47200	200	31900	330
FEB.	1986	39832	1520	873	93900	300	32200	200	21700	330
MAR.	1986	53618	1540	883	128000	300	43800	200	29600	340
APR.	1986	150390	1520	871	354000	300	121100	200	81700	330
MAY	1986	199320	1510	869	468000	300	160100	200	108000	330
JUNE	1986	348520	1550	891	838000	310	287200	210	193800	340
JULY	1986	113231	1560	895	274000	310	93700	210	63300	340
AUG.	1986	64819	1570	904	158000	310	54200	210	36600	340
SEPT	1986	164359	1610	927	411000	320	141000	210	95200	350
TOTAL		1598753	**	**	3704000	**	1268000	**	856000	**
WTD. AVG.		4380	1500	858	**	290	**	200	**	330

## RED RIVER BASIN

07331600 RED RIVER AT DENISON DAM NEAR DENISON, TX--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
EQUIVALENT MEAN

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1200	1300	1350	1400	1530	1510	1540	1520	1500	1560	1580	1570
2	1200	1300	1360	1410	1530	1520	1540	1500	1500	1560	1570	1550
3	1200	1300	1370	1430	1530	1520	1530	1500	1500	1560	1570	1550
4	1200	1300	1390	1430	1540	1510	1510	1500	1530	1540	1570	1530
5	1200	1300	1390	1440	1530	1510	1510	1500	1550	1540	1570	1510
6	1200	1300	1390	1440	1510	1510	1510	1510	1570	1520	1570	1510
7	1200	1300	1380	1430	1530	1520	1510	1520	1570	1520	1570	1500
8	1200	1310	1380	1430	1530	1530	1510	1510	1570	1580	1570	1490
9	1200	1310	1380	1440	1530	1530	1500	1530	1570	1580	1570	1490
10	1200	1310	1380	1440	1530	1540	1510	1530	1570	1580	1570	1510
11	1200	1320	1410	1440	1530	1540	1510	1530	1530	1590	1570	1500
12	1200	1320	1380	1440	1530	1550	1510	1530	1540	1590	1580	1500
13	1210	1320	1370	1440	1520	1530	1520	1530	1580	1580	1580	1510
14	1210	1320	1370	1450	1510	1530	1520	1520	1570	1580	1580	1510
15	1210	1320	1360	1460	1510	1530	1530	1520	1570	1580	1520	1520
16	1200	1330	1360	1500	1510	1530	1560	1540	1570	1590	1550	1600
17	1200	1330	1360	1550	1510	1530	1560	1520	1550	1500	1550	1710
18	1450	1330	1400	1600	1510	1530	1540	1510	1550	1590	1570	1730
19	1400	1330	1400	1600	1510	1540	1540	1500	1540	1580	1580	1700
20	1400	1340	1390	1650	1510	1540	1540	1510	1540	1580	1580	1700
21	1350	1340	1390	1680	1510	1550	1540	1510	1550	1580	1580	1650
22	1380	1340	1390	1610	1520	1550	1530	1530	1550	1470	1570	1610
23	1410	1340	1390	1530	1520	1550	1530	1520	1560	1480	1570	1620
24	1490	1340	1390	1560	1520	1550	1530	1520	1550	1580	1570	1640
25	1510	1340	1390	1570	1520	1560	1530	1520	1550	1580	1580	1670
26	1500	1350	1400	1570	1500	1560	1520	1520	1530	1580	1610	1670
27	1450	1350	1400	1580	1500	1550	1510	1520	1540	1580	1580	1650
28	1410	1350	1390	1530	1500	1560	1500	1510	1540	1580	1580	1630
29	1270	1350	1390	1530	---	1560	1500	1510	1550	1500	1570	1620
30	1280	1350	1480	1540	---	1560	1480	1500	1550	1570	1570	1610
31	1300	---	1390	1530	---	1550	---	1500	---	1500	1570	---
MEAN	1290	1320	1390	1500	1520	1540	1520	1520	1550	1560	1570	1590
WTR YR 1986		MEAN	1490	MAX	1730	MIN	1200					

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22.0		---	---	---	---	---	22.0	---	23.0	22.0	---
2	22.0		14.0	9.0	---	---	---	18.0	22.0	24.0	23.0	---
3	22.0		14.0	9.0	10.0	11.0	13.0	---	23.0	24.0	23.0	---
4	22.0		14.0	---	10.0	11.0	14.0	---	22.0	---	---	---
5	---		14.0	---	10.0	11.0	---	18.0	22.0	---	22.0	---
6	---		14.0	9.0	9.0	10.0	---	18.0	22.0	---	23.0	---
7	21.0		---	9.0	10.0	10.0	16.0	18.0	---	24.0	---	---
8	21.0		---	10.0	---	---	14.0	18.0	---	24.0	---	---
9	21.0		14.0	8.0	---	---	15.0	18.0	---	25.0	---	25.0
10	21.0		14.0	8.0	10.0	10.0	16.0	---	23.0	25.0	---	25.0
11	---		14.0	---	9.0	10.0	---	---	23.0	25.0	22.0	25.0
12	---		13.0	---	9.0	10.0	---	18.0	23.0	---	22.0	26.0
13	---		13.0	10.0	9.0	11.0	---	18.0	23.0	---	22.0	---
14	---		---	9.0	8.0	11.0	15.0	19.0	---	---	22.0	---
15	21.0		---	9.0	---	---	16.0	19.0	---	25.0	26.0	25.0
16	21.0		---	9.0	---	---	16.0	20.0	23.0	25.0	---	25.0
17	21.0		15.0	15.0	---	11.0	15.0	---	22.0	22.0	---	25.0
18	21.0		15.0	---	8.0	---	15.0	---	23.0	22.0	22.0	25.0
19	---		---	---	8.0	12.0	---	20.0	---	---	22.0	---
20	---		15.0	---	8.0	12.0	---	21.0	23.0	---	25.0	---
21	21.0		---	9.0	9.0	12.0	17.0	21.0	---	21.0	22.0	---
22	---		---	14.0	---	---	17.0	21.0	---	21.0	22.0	26.0
23	21.0		15.0	16.0	---	---	---	---	23.0	25.0	---	26.0
24	21.0		15.0	8.0	10.0	12.0	---	---	23.0	21.0	---	26.0
25	21.0		---	---	9.0	12.0	18.0	---	23.0	---	22.0	25.0
26	---		9.0	---	9.0	12.0	---	---	23.0	---	22.0	25.0
27	---		9.0	8.0	10.0	13.0	---	23.0	---	---	22.0	---
28	21.0		---	8.0	9.0	13.0	18.0	21.0	---	21.0	---	---
29	21.0		14.0	8.0	---	---	---	21.0	---	25.0	---	26.0
30	21.0		10.0	8.0	---	---	18.0	22.0	23.0	22.0	---	26.0
31	20.0		9.0	8.0	---	13.0	---	---	---	25.0	---	---
MEAN	21.0		13.0	9.5	9.0	11.5	16.0	19.5	22.5	23.5	22.5	25.5
WTR YR 1986		MEAN	17.5	MAX	26.0	MIN	8.0					

## RED RIVER BASIN

287

07332400 BLUE RIVER AT MILBURN, OK

LOCATION.--Lat 34°15'04", long 96°33'05", in SW 1/4 SW 1/4 sec.35, T.3 S., R.7 E., Johnston County, Hydrologic Unit 11140102, on downstream side of left pier of bridge on State Highway 48A, 0.5 mi north of Milburn, and at mile 84.9.

DRAINAGE AREA.--203 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1965 to current year. Occasional low-flow measurements made in water years 1956-61. Prior to October 1975 published as Blue Creek near Milburn.

GAGE.--Water-stage recorder. Datum of gage is 649.65 ft, Oklahoma State Highway Department datum.

REMARKS.--No estimated daily discharges. Records poor, Oct. 1 through Mar. 4, and good thereafter. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--21 years, 140 ft<sup>3</sup>/s, 9.37 in/yr, 101,430 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,100 ft<sup>3</sup>/s, Oct. 8, 1970, gage height, 27.87 ft; minimum daily discharge, 15 ft<sup>3</sup>/s Aug. 22, 24, 25, Sept. 1, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,200 ft<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. 19	0600	3,830	18.27	June 4	2200	*6,480	*22.07

Minimum daily discharge, 35 ft<sup>3</sup>/s, Oct. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	35	310	616	133	88	82	67	100	210	102	58	50		
2	37	166	618	132	85	80	71	140	236	102	59	52		
3	39	114	616	129	84	80	75	106	197	100	58	52		
4	38	109	220	130	101	81	89	87	1220	97	58	359		
5	39	111	163	130	95	70	76	85	1010	94	58	307		
6	39	121	161	129	91	69	73	85	311	91	57	160		
7	39	127	159	124	100	68	70	82	229	90	56	121		
8	38	115	159	119	104	68	67	82	260	87	57	101		
9	39	106	159	119	127	69	62	82	197	85	57	99		
10	39	105	159	105	111	77	62	312	197	84	55	95		
11	38	104	149	95	114	72	62	398	431	82	57	92		
12	39	100	222	108	114	107	64	161	177	78	54	87		
13	39	101	190	109	112	99	63	139	161	78	54	84		
14	38	100	198	108	111	83	62	122	157	76	53	81		
15	39	97	163	108	109	77	60	1020	154	74	53	85		
16	39	97	159	109	104	80	60	305	341	73	67	85		
17	40	114	158	106	100	74	61	504	326	72	55	84		
18	1260	149	156	106	98	123	66	458	164	69	52	119		
19	1770	220	155	105	98	103	409	388	156	68	50	88		
20	129	208	155	106	97	90	260	225	150	68	47	78		
21	108	190	153	105	92	79	146	179	143	66	46	74		
22	109	158	150	102	92	75	116	164	136	66	46	73		
23	109	150	146	100	92	73	105	161	130	65	46	70		
24	106	149	147	97	146	72	99	178	165	64	46	68		
25	89	135	141	95	85	70	92	171	129	63	46	68		
26	84	350	138	94	85	70	87	160	120	62	45	67		
27	84	408	136	92	84	71	93	158	116	61	48	67		
28	84	396	136	92	82	68	93	157	112	60	57	71		
29	1290	374	136	92	---	68	86	153	107	60	49	67		
30	306	344	138	91	---	67	102	154	104	59	48	64		
31	166	---	135	86	---	68	---	159	---	58	48	---		
TOTAL	6348	5328	6291	3356	2809	2433	2898	6675	7546	2354	1640	2968		
MEAN	205	178	203	108	100	78.5	96.6	215	252	75.9	52.9	98.9		
MAX	1770	408	618	133	146	123	409	1020	1220	102	67	359		
MIN	35	97	135	86	82	67	60	82	104	58	45	50		
CFSM	1.01	.88	1.00	.53	.49	.39	.48	1.06	1.24	.37	.26	.49		
IN.	1.16	.98	1.15	.61	.51	.45	.53	1.22	1.38	.43	.30	.54		
AC-FT	12590	10570	12480	6660	5570	4830	5750	13240	14970	4670	3250	5890		
CAL YR 1985	TOTAL	82215	MEAN	225	MAX	7430	MIN	33	CFSM	1.11	IN.	15.07	AC-FT	163100
WTR YR 1986	TOTAL	50646	MEAN	139	MAX	1770	MIN	35	CFSM	.68	IN.	9.28	AC-FT	100500



## RED RIVER BASIN

07332500 BLUE RIVER NEAR BLUE, OK

LOCATION.--Lat 33°59'49", long 96°14'27", on line between sec.27 and 34, T.6 S., R.10 E., Bryan County, Hydrologic Unit 11140102, near left bank on downstream side of pier of bridge on U.S. Highway 70, 1.0 mi west of Blue, 7.0 mi east of Durant, 7.7 mi upstream from Caddo Creek, and at mile 38.8.

DRAINAGE AREA.--476 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1936 to current year. Monthly discharge only for some periods, published in WSP 1311, 1731.

REVISED RECORDS.--WSP 957: 1938. WSP 1241: 1936, drainage area.

GAGE.--Water-stage recorder. Datum of gage is 503.36 ft, National Geodetic Vertical Datum of 1929.

Prior to Mar. 13, 1945, nonrecording gage and Mar. 13, 1945 to Feb. 2, 1960, water-stage recorder at site 1.2 mi downstream at datum 5.00 ft lower.

REMARKS.--No estimated daily discharges. Records poor. Some regulation at low flow by a State fish hatchery, 16.0 mi above station. Small diversion above station for municipal water supply of city of Durant.

COOPERATION.--Gage-height record and 3 discharge measurements furnished by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--50 years, 299 ft<sup>3</sup>/s, 8.53 in/yr, 216,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 65,200 ft<sup>3</sup>/s, Oct. 14, 1981, gage height, 44.20 ft, from high-water mark; no flow (estimated) Aug. 3, 4, 1936, result of regulation at fish hatchery, and no flow Sept. 19 to Oct. 16, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft<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)
Apr. 4	1130	5,190	21.43	June 8	1000	6,150	22.90
Apr. 20	0430	*7,560	*24.81	June 17	0300	4,170	19.18
May 1	1100	4,570	20.12				

Minimum daily discharge, 28 ft<sup>3</sup>/s, Oct. 6-9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	191	659	95	80	84	75	3680	251	99	42	44
2	41	116	910	94	80	82	63	542	638	97	43	49
3	32	97	367	94	1700	82	264	254	906	97	54	52
4	31	91	230	93	1270	82	4230	171	746	95	60	78
5	30	87	193	92	241	78	900	125	1560	94	55	1030
6	28	85	169	91	2320	80	234	103	1150	91	54	1170
7	28	82	148	90	1270	80	139	98	598	91	52	440
8	28	81	138	90	418	80	104	95	4640	91	50	113
9	28	80	129	90	283	80	95	188	1180	86	51	88
10	29	78	121	89	203	80	93	1400	1120	86	52	81
11	31	78	125	89	167	83	88	823	2220	84	53	79
12	33	77	353	89	134	93	99	489	624	82	51	76
13	36	76	335	89	121	99	86	225	326	82	48	72
14	37	75	207	88	117	97	84	335	244	81	39	69
15	41	172	164	87	113	107	80	2440	211	80	49	67
16	40	161	149	87	106	174	79	1160	1210	79	379	71
17	42	88	146	88	105	96	78	1980	3690	78	80	87
18	135	83	136	87	100	141	85	1380	1250	76	72	76
19	510	419	127	87	98	292	3680	696	381	72	57	77
20	1280	698	117	87	95	151	6340	455	279	66	46	80
21	189	335	111	85	93	95	1570	305	248	68	39	67
22	98	164	109	84	91	90	374	238	192	64	42	62
23	87	116	104	83	89	85	246	200	168	61	39	61
24	81	101	105	83	89	82	180	196	980	63	35	61
25	75	97	102	83	89	82	148	242	276	64	35	59
26	77	227	100	82	88	82	119	234	173	62	40	58
27	79	1250	98	82	102	81	105	183	143	62	42	56
28	64	1260	97	81	85	80	100	164	124	58	41	57
29	418	324	96	81	---	76	102	146	112	57	45	57
30	683	215	96	80	---	73	589	131	102	55	51	62
31	559	---	96	80	---	76	---	124	---	49	44	---
TOTAL	4921	7004	6037	2700	9747	3043	20429	18802	25742	2370	1840	4499
MEAN	159	233	195	87.1	348	98.2	681	607	858	76.5	59.4	150
MAX	1280	1260	910	95	2320	292	6340	3680	4640	99	379	1170
MIN	28	75	96	80	80	73	63	95	102	49	35	44
CFSM	.33	.49	.41	.18	.73	.21	1.43	1.28	1.80	.16	.12	.32
IN.	.38	.55	.47	.21	.76	.24	1.60	1.47	2.01	.19	.14	.35
AC-FT	9760	13890	11970	5360	19330	6040	40520	37290	51060	4700	3650	8920

CAL YR 1985	TOTAL	161236	MEAN	442	MAX	9260	MIN	19	CFSM	.93	IN.	12.60	AC-FT	319800
WTR YR 1986	TOTAL	107134	MEAN	294	MAX	6340	MIN	28	CFSM	.62	IN.	8.37	AC-FT	212500



## RED RIVER BASIN

289

07334000 MUDDY BOGGY CREEK NEAR FARRIS, OK

LOCATION.--Lat 34°16'17", long 95°54'43", in NE 1/4 NW 1/4 sec.26, T.3 S., R.13 E., Atoka County, Hydrologic Unit 11140103, on downstream left bank of bridge on State Highway 3, 1.3 mi downstream from McGee Creek, 2.8 mi northwest of Farris, and at mile 57.7.

DRAINAGE AREA.--1,087 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 444.58 ft, National Geodetic Vertical Datum of 1929.

Prior to Mar. 13, 1945, nonrecording gage, and Mar. 13, 1945 to Sept. 30, 1961, water-stage recorder at same site at datum 2.00 ft higher.

REMARKS.--Estimated daily discharges: Oct. 1-15, Dec. 1-3, 11-13, Feb. 3-9, and Apr. 3-7, 17-21. Records poor. Some regulation since June 1959 by Atoka Reservoir, capacity, 125,000 acre-ft, on North Boggy Creek, drainage area, 176 mi<sup>2</sup>; pipeline diversions to Oklahoma City since November 1963, normal capacity, 60 Mgal/d. McGee Creek Reservoir construction above station.

COOPERATION.--Gage-height records and 4 discharge measurements furnished by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--49 years, 880 ft<sup>3</sup>/s, 637,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 61,900 ft<sup>3</sup>/s June 17, 1945, gage height, 44.94 ft, datum then in use, from rating curve extended above 37,000 ft<sup>3</sup>/s; no flow at times in many years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 10,000 ft<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)
Nov. 17	1600	*12,500	*31.99	June 6	1100	11,300	30.56
May 17	2100	10,000	28.62	Sept. 5	1700	12,300	31.71

Minimum daily discharge, 1.3 ft<sup>3</sup>/s, Aug. 31 to Sept. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	2410	2400	74	24	48	50	854	183	29	5.8	1.3
2	3.1	682	5550	70	24	45	49	2100	588	26	5.2	1.3
3	3.0	241	2480	68	3700	45	1700	3890	2740	23	5.3	147
4	2.9	152	1210	65	7010	42	4650	2730	2960	18	4.9	1930
5	2.8	107	646	60	4100	39	3070	718	3750	16	4.2	9990
6	2.7	78	494	57	7950	36	5100	408	10700	14	3.8	5760
7	2.6	60	392	55	4000	34	2200	299	5640	12	3.5	1270
8	2.6	48	328	51	4720	34	872	247	2410	11	15	997
9	2.5	40	278	48	2200	33	659	218	1380	9.9	36	357
10	2.5	35	247	47	1050	35	468	877	942	9.1	13	175
11	2.4	30	940	46	697	74	341	2900	1560	8.3	8.6	106
12	2.4	26	2950	44	509	887	276	1730	874	7.7	4.5	67
13	2.5	25	3250	40	413	609	243	659	477	7.2	2.9	46
14	2.6	27	1020	39	371	423	200	510	291	7.0	2.5	33
15	2.7	698	584	39	331	371	213	5060	195	6.4	5.3	28
16	4.1	1580	433	39	302	316	174	8730	158	5.8	19	28
17	12	765	386	39	276	253	136	8790	275	5.3	11	34
18	333	3490	325	39	239	506	810	8100	373	4.8	8.7	20
19	257	5980	274	39	211	845	3650	4580	253	4.4	6.6	22
20	1710	4510	232	39	149	899	11300	2490	200	4.1	7.0	24
21	1910	3650	198	39	116	574	7890	1320	126	4.4	7.2	22
22	554	1270	171	39	100	349	4700	731	93	6.1	5.3	17
23	182	552	156	39	87	253	2580	483	70	4.3	4.3	14
24	109	380	142	39	80	194	1020	615	58	7.1	3.4	12
25	74	284	126	37	140	153	561	2270	50	9.5	2.9	10
26	51	1160	115	36	155	128	397	1090	55	9.2	2.5	10
27	38	10600	106	32	62	88	283	642	41	7.4	2.1	10
28	39	3100	94	28	52	72	212	414	42	7.2	2.0	179
29	1120	1360	83	25	---	65	154	285	42	8.6	1.8	655
30	1360	957	77	24	---	58	148	207	32	8.3	1.5	348
31	2810	---	77	24	---	53	---	167	---	6.9	1.3	---
TOTAL	10603.6	44297	25764	1360	39068	7561	54106	64114	36558	308.0	207.1	22313.6
MEAN	342	1477	831	43.9	1395	244	1804	2068	1219	9.94	6.68	744
MAX	2810	10600	5550	74	7950	899	11300	8790	10700	29	36	9990
MIN	2.4	25	77	24	24	33	49	167	32	4.1	1.3	1.3
AC-FT	21030	87860	51100	2700	77490	15000	107300	127200	72510	611	411	44260

CAL YR 1985 TOTAL 490702.3 MEAN 1344 MAX 17500 MIN 2.4 AC-FT 973300  
WTR YR 1986 TOTAL 306258.8 MEAN 839 MAX 11300 MIN 1.3 AC-FT 607500

## RED RIVER BASIN

07334200 BYRD'S MILL SPRING NEAR FITTSTOWN, OK

LOCATION.--Lat 34°35'45", long 96°39'55", in SW 1/4 SW 1/4 sec.34, T.2 N., R.6 E., Pontotoc County, Hydrologic Unit 11140104, upstream from weir outlet of spring, 0.5 mi upstream from Big Spring Creek, 2.0 mi west of Fittstown, and 12.0 mi south of Ada.

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

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 1,021.17 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Feb. 10 through Mar. 2. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Records do not include diversion of about 6 to 10 ft<sup>3</sup>/s by city of Ada for municipal water supply, a part of which is discharged as effluent to Sandy Creek, tributary to Canadian River. Records of zero flow do not include seepage of up to 0.10 ft<sup>3</sup>/s.

AVERAGE DISCHARGE.--27 years, 7.52 ft<sup>3</sup>/s, 5,450 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30 ft<sup>3</sup>/s, May 30, 1960, gage height, 3.22 ft; no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 16 ft<sup>3</sup>/s, Dec. 24, 25, gage height, 3.06 ft; minimum daily discharge, 4.1 ft<sup>3</sup>/s, Aug. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	13	14	15	14	12	9.0	8.7	14	14	4.4	8.1
2	9.0	13	14	15	14	12	9.0	9.0	14	14	4.4	8.3
3	9.0	13	14	15	14	12	9.0	9.0	14	14	4.4	8.1
4	10	13	14	15	14	12	9.0	9.0	14	14	4.2	8.1
5	11	13	14	15	14	12	9.0	9.0	14	14	4.2	8.1
6	11	13	14	15	14	12	8.9	9.0	14	13	4.1	8.1
7	11	13	14	15	14	12	9.0	8.7	14	13	6.0	8.1
8	11	13	14	15	13	12	8.9	8.8	14	13	7.3	8.1
9	10	13	14	14	13	12	8.7	9.0	14	13	7.3	8.0
10	12	13	14	14	13	13	8.6	9.0	14	12	7.3	7.7
11	12	13	14	14	13	13	8.6	9.0	14	12	7.0	7.7
12	11	13	14	14	13	13	8.8	9.0	14	12	6.8	7.7
13	11	13	14	14	13	13	8.6	9.0	14	11	6.7	7.7
14	11	13	14	14	13	13	8.6	9.3	14	11	8.3	7.7
15	11	13	14	14	13	13	8.6	10	14	11	9.3	7.7
16	11	13	15	14	13	13	8.6	10	15	11	9.5	7.7
17	11	13	15	14	12	13	8.6	11	14	10	9.5	7.8
18	13	13	15	14	13	11	8.6	11	14	9.9	9.1	7.9
19	12	13	15	14	13	9.6	8.6	12	14	9.7	9.1	7.7
20	12	13	15	15	13	9.5	8.6	12	14	9.2	9.1	7.7
21	12	14	15	15	13	9.7	8.6	13	14	9.0	8.8	7.7
22	12	14	15	14	13	10	8.6	13	14	8.8	8.2	7.7
23	12	14	15	14	13	9.7	8.6	13	14	8.8	8.1	7.7
24	12	14	16	14	13	9.7	8.6	13	14	8.6	8.1	7.7
25	12	14	15	14	12	9.6	8.3	13	14	8.6	7.9	7.7
26	12	14	15	14	12	9.3	8.4	13	14	8.4	7.6	7.7
27	12	14	15	14	12	9.2	8.4	13	14	8.3	7.1	7.3
28	12	13	15	14	12	9.1	8.2	14	14	8.1	8.0	7.3
29	13	14	15	14	---	9.0	9.9	14	14	7.6	8.6	7.3
30	13	14	15	14	---	9.0	9.3	14	14	5.4	8.3	7.3
31	13	---	15	14	---	9.0	---	14	---	4.4	8.2	---
TOTAL	353.0	399	451	444	366	345.4	262.2	338.5	421	326.8	226.9	233.4
MEAN	11.4	13.3	14.5	14.3	13.1	11.1	8.74	10.9	14.0	10.5	7.32	7.78
MAX	13	14	16	15	14	13	9.9	14	15	14	9.5	8.3
MIN	9.0	13	14	14	12	9.0	8.2	8.7	14	4.4	4.1	7.3
AC-FT	700	791	895	881	726	685	520	671	835	648	450	463
CAL YR 1985	TOTAL	5757.1	MEAN	15.8	MAX	25	MIN	7.3	AC-FT	11420		
WTR YR 1986	TOTAL	4167.2	MEAN	11.4	MAX	16	MIN	4.1	AC-FT	8270		

## RED RIVER BASIN

291

07335000 CLEAR BOGGY CREEK NEAR CANEY, OK

LOCATION.--Lat 34°15'09", long 96°12'19", in NW 1/4 SE 1/4 sec.36, T.3 S., R.10 E., Atoka County, Hydrologic Unit 11140104, on downstream side of left pier of bridge on old U.S. Highways 69 and 75, 0.5 mi downstream from Caney Creek, 1.5 mi north of Caney, and at mile 24.1.

DRAINAGE AREA.--720 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1942 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 485.05 ft, National Geodetic Vertical Datum of 1929. Prior to Mar. 13, 1945, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 1-20, Jan. 4-9, 15, 17, 22-31, Feb. 3, 5-13, Feb. 18 to Mar. 6, Apr. 2, June 2-5, June 27 to July 21, July 23 to Aug. 4, and Aug. 6 to Sept. 3, 16-18. Records fair.

COOPERATION.--Gage-height record and 3 discharge measurements furnished by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--44 years, 494 ft<sup>3</sup>/s, 9.32 in/yr, 357,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,500 ft<sup>3</sup>/s, Oct. 14, 1981, gage height, 26.60 ft, maximum gage height, 26.77 ft, Dec. 11, 1946; no flow at times in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 26.9 ft occurred in February 1938, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft<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)
Apr. 20	0100	*6,710	*21.33	Sept. 5	0430	4,880	19.49
June 6	1500	5,290	20.07				

Minimum daily discharge, 7.6 ft<sup>3</sup>/s, Sept. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65	1190	2070	150	61	97	91	660	347	205	19	7.6
2	59	874	3110	140	59	96	91	1540	960	175	18	35
3	56	691	1440	131	110	94	97	1200	1450	153	17	80
4	54	539	1000	120	118	92	995	892	2230	137	16	329
5	52	431	799	110	112	89	1150	718	3590	123	16	3510
6	51	353	681	100	130	87	711	589	4990	110	16	1110
7	49	292	581	99	110	85	498	481	2400	98	40	754
8	47	245	481	98	99	84	363	364	2960	93	80	660
9	46	208	421	95	91	83	286	310	1670	83	60	441
10	84	176	381	92	82	91	231	404	1520	77	40	353
11	155	155	791	95	130	99	180	1540	2120	70	20	245
12	183	136	2090	92	143	143	146	1140	1120	64	15	196
13	178	124	1080	86	160	202	132	699	720	59	13	161
14	162	120	748	89	126	268	123	493	563	55	13	141
15	153	155	600	90	130	189	107	2460	462	52	12	125
16	147	171	541	91	142	170	92	4280	721	49	12	128
17	142	202	468	95	160	153	81	3410	3590	47	12	112
18	213	228	413	96	149	215	82	2960	1930	44	22	100
19	185	1370	367	100	138	319	1780	2720	1070	42	19	89
20	170	2050	326	96	128	404	5000	1680	844	41	17	78
21	715	1150	289	92	120	250	2470	1140	745	38	16	72
22	557	834	285	95	116	187	1290	892	531	37	15	67
23	424	614	269	87	112	168	864	699	448	35	13	60
24	343	474	257	80	108	149	644	1240	1440	33	12	56
25	293	400	234	76	104	136	501	1250	800	31	12	55
26	245	543	213	75	102	124	398	702	652	29	11	53
27	189	3290	197	72	99	115	333	570	400	27	10	52
28	149	2740	189	69	98	110	296	485	312	25	9.6	65
29	322	1170	180	67	---	109	271	431	263	24	9.1	165
30	2320	904	165	65	---	103	602	380	233	22	8.5	103
31	2890	---	155	62	---	97	---	337	---	20	8.0	---
TOTAL	10698	21829	20821	2905	3237	4608	19905	36666	41081	2098	601.2	9402.6
MEAN	345	728	672	93.7	116	149	663	1183	1369	67.7	19.4	313
MAX	2890	3290	3110	150	160	404	5000	4280	4990	205	80	3510
MIN	46	120	155	62	59	83	81	310	233	20	8.0	7.6
AC-FT	21220	43300	41300	5760	6420	9140	39480	72730	81480	4160	1190	18650

CAL YR 1985 TOTAL 397730.0 MEAN 1090 MAX 14000 MIN 24 AC-FT 788900  
WTR YR 1986 TOTAL 173851.8 MEAN 476 MAX 5000 MIN 7.6 AC-FT 344800

## RED RIVER BASIN

07335300 MUDDY BOGGY CREEK NEAR UNGER, OK

LOCATION.--Lat 34°01'36", long 95°45'00", in SE 1/4 SE 1/4 sec.17, T.6 S., R.15 E., Choctaw County, Hydrologic Unit 11140103, at bridge on U.S. Highway 70, 3.5 mi west of Soper, 1.8 mi east of Unger and at mile 18.6.

DRAINAGE AREA.--2,273 mi<sup>2</sup>.

PERIOD OF RECORD.--August 25, 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is 392.72 ft, National Geodetic Vertical Datum of 1929. Auxiliary gage 7.4 mi downstream. Prior to Sept. 19, 1985, gage 500 ft downstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,000 ft<sup>3</sup>/s, Apr. 26, 1985, gage height, 44.05 ft; minimum daily discharge, 1.8 ft<sup>3</sup>/s, Sept. 8, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 15,300 ft<sup>3</sup>/s, Apr. 22, gage height, 39.10 ft; minimum daily discharge, 21 ft<sup>3</sup>/s, Sept. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	4610	7740	313	158	268	254	713	2960	314	36	21
2	35	4660	5990	300	160	254	250	1910	1390	266	34	22
3	33	2380	6480	291	3820	244	478	3740	2950	230	30	23
4	32	1210	6740	282	6610	236	5720	5470	5740	208	30	283
5	30	883	4670	270	6590	228	5200	4430	6820	194	28	3270
6	28	640	2050	259	6400	222	6120	1860	7370	177	26	6210
7	28	485	1410	243	7020	215	5730	1140	8470	159	26	7830
8	28	381	1180	238	7550	208	2860	920	10400	146	25	7490
9	26	313	1040	226	6980	206	1500	781	11600	132	25	3570
10	26	263	939	222	4220	208	1150	1050	11000	121	38	1110
11	26	231	926	218	2210	218	939	2440	9360	112	98	611
12	27	206	1240	216	1510	572	751	4530	7970	104	80	407
13	26	192	3960	211	1200	1470	625	3670	5910	96	69	275
14	27	180	4300	206	1070	1100	535	1910	2920	89	66	203
15	31	1060	2380	204	989	1010	465	3080	1360	83	58	162
16	33	2480	1410	201	917	1330	436	6280	1400	77	80	148
17	36	2260	1130	199	841	1040	384	8120	1630	72	89	212
18	379	3500	1030	211	769	1450	344	10100	2450	67	121	235
19	1490	6170	924	215	683	2180	3780	12500	3390	63	83	171
20	1230	6400	800	217	597	1740	8740	12900	2890	61	60	127
21	2920	6630	697	213	509	1480	11300	11300	1740	56	48	116
22	2860	6410	622	208	427	1110	14600	8970	1230	52	42	112
23	1410	3590	564	199	386	813	14500	4880	946	49	39	102
24	781	1510	527	191	355	625	11800	3280	1130	49	36	91
25	515	1090	481	182	331	519	8220	5330	1900	49	32	81
26	391	1430	439	179	345	440	2730	5570	1640	44	28	73
27	322	4500	405	179	417	395	1120	4020	1000	42	27	68
28	279	7000	381	177	312	346	900	2010	659	44	33	65
29	1780	8690	359	170	---	309	752	1260	484	41	27	145
30	2690	9000	344	167	---	285	643	945	382	37	23	718
31	2960	---	328	162	---	269	---	1140	---	35	22	---
TOTAL	20518	88354	61486	6769	63376	20990	112826	136249	119091	3269	1459	33951
MEAN	662	2945	1983	218	2263	677	3761	4395	3970	105	47.1	1132
MAX	2960	9000	7740	313	7550	2180	14600	12900	11600	314	121	7830
MIN	26	180	328	162	158	206	250	713	382	35	22	21
AC-FT	40700	175300	122000	13430	125700	41630	223800	270200	236200	6480	2890	67340
CAL YR 1985	TOTAL 1114600	MEAN 3054	MAX 27700	MIN 25	AC-FT 2211000							
WTR YR 1986	TOTAL 668338	MEAN 1831	MAX 14600	MIN 21	AC-FT 1326000							

## 07335500 RED RIVER AT ARTHUR CITY, TX

LOCATION.--Lat 33°52'32", long 95°30'08", in NW 1/4 sec.11, T.8 S., R.17 E., Choctaw County, OK, Hydrologic Unit 11140101, on right downstream bank of bridge on U.S. Highway 271 at Arthur City, 10.6 mi downstream from Muddy Boggy River, 26.0 mi upstream from Kiamichi River, and at mile 633.1.

DRAINAGE AREA.--44,531 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> probably is noncontributing.

PERIOD OF RECORD.--January to September 1905 (gage heights and discharge measurements only), October 1905 to December 1911, July 1936 to current year. Monthly discharge only for some periods, published in WSP 1311. Gage-height records collected at same site since 1891 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1241: Drainage area. WSP 1311: 1906-11.

GAGE.--Water-stage recorder. Datum of gage is 380.07 ft, National Geodetic Vertical Datum of 1929. From 1905-11 nonrecording gage at St. Louis-San Francisco Railway Co. bridge 200 ft upstream at same datum. July 1, 1936 to Mar. 24, 1940, nonrecording gage at present site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since October 1943 by Lake Texoma (station 07331500), 92.8 mi above station.

COOPERATION.--Gage-height record and 3 discharge measurements furnished by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--(Prior to regulation by Denison Dam), 13 years (water years 1906-11, 1937-43), 9,266 ft<sup>3</sup>/s, 6,713,000 acre-ft/yr; (since regulation by Denison Dam), 42 years (water years 1945-86), 7,973 ft<sup>3</sup>/s, 5,776,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 400,000 ft<sup>3</sup>/s May 28, 1908, gage height, 43.2 ft, from rating curve extended above 41,000 ft<sup>3</sup>/s, on basis of records for later years; minimum, 130 ft<sup>3</sup>/s, Dec. 11-12, 1956, gage height, 4.49 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 49,100 ft<sup>3</sup>/s, June 6, gage height, 18.05 ft; minimum daily discharge, 259 ft<sup>3</sup>/s, Oct. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	501	15000	17500	2150	2060	2880	1500	8290	17700	8160	3930	1050
2	486	15000	15700	1910	1960	3960	1390	10800	16600	8410	4640	799
3	478	13200	14100	1420	10300	3500	2530	13300	20900	8130	5010	749
4	402	11400	13700	2470	35200	2680	16600	13600	26000	9230	4600	859
5	340	10900	10500	3880	27600	2840	31500	13300	34500	8300	4330	3660
6	297	10600	7290	3140	21700	2760	23600	10700	45600	7460	4310	8850
7	275	9110	5720	3760	23500	2830	19700	9040	33400	6980	4210	15900
8	274	7740	5540	4410	20200	2070	16600	6280	30500	7110	3580	13300
9	259	7370	5090	4540	16500	1880	10300	5220	39000	6920	3540	7960
10	276	6930	4750	4740	13000	2700	8590	7050	42700	5470	3560	5810
11	1330	5060	5140	4090	9740	2110	7830	6880	35600	5280	3600	7380
12	1620	4830	5810	3580	8290	1770	7470	9930	31200	5200	3480	7070
13	2710	6730	8540	1900	7820	3430	7220	8690	25900	5150	3600	6940
14	3340	7140	9510	1330	6270	3940	7080	6610	20900	5120	3950	6850
15	2930	11500	8290	1880	5260	4480	6880	6710	15800	5100	4020	6820
16	2470	17300	6240	2480	4930	5560	6350	12200	15000	5030	4310	6850
17	2230	17700	5250	2520	3700	5640	5440	16700	20300	5000	4790	7570
18	2650	18300	5180	2550	3140	4040	4880	22700	26500	4980	3700	7900
19	6650	23200	4750	2280	3720	6580	8150	27400	22000	4520	3270	8000
20	12300	19600	4580	1600	4000	8060	23700	24500	17800	4260	3110	8390
21	13600	17900	4250	1150	2920	8570	27900	21900	19200	2790	2840	8430
22	12800	15400	4010	1660	2310	8230	23300	20300	20100	1710	2760	8520
23	11900	12600	3740	2350	2860	5930	20800	16900	19000	2500	2220	8430
24	10800	9690	3320	2920	3930	3430	19900	14600	19200	3950	1640	9390
25	10400	8740	3720	3790	2860	2180	17400	22400	21500	4020	1720	10900
26	10300	9520	2330	3530	3090	3340	11900	20400	16000	4010	1070	10800
27	10100	16800	1820	2580	2450	4720	9470	17400	11900	4000	973	10800
28	10200	19200	2930	1720	1940	3470	11300	14700	10200	3990	2120	9500
29	12000	19300	3620	3210	---	3080	11200	13200	8900	3980	2320	6730
30	17200	17600	2150	2340	---	2750	9760	12600	8140	4060	2270	6500
31	15900	---	1600	1930	---	2240	---	12300	---	4000	2000	---
TOTAL	177018	385360	196670	83810	251250	121650	380240	426600	692040	164820	101473	222707
MEAN	5710	12850	6344	2704	8973	3924	12670	13760	23070	5317	3273	7424
MAX	17200	23200	17500	4740	35200	8570	31500	27400	45600	9230	5010	15900
MIN	259	4830	1600	1150	1940	1770	1390	5220	8140	1710	973	749
AC-FT	351100	764400	390100	166200	498400	241300	754200	846200	1373000	326900	201300	441700
CAL YR 1985	TOTAL	5279768		MEAN	14470	MAX	52300	MIN	259	AC-FT	10472000	
WTR YR 1986	TOTAL	3203638		MEAN	8777	MAX	45600	MIN	259	AC-FT	6354000	



## RED RIVER BASIN

07335700 KIAMICHI RIVER NEAR BIG CEDAR, OK  
(Hydrologic bench-mark station)

LOCATION.--Lat 34°38'18", long 94°36'45", in SW 1/4 SE 1/4 sec.18, T.2 N., R.26 E., Le Flore County, Hydrologic Unit 11140105, in Ouachita National Forest, on downstream side of right bank pier of bridge on State Highway 63, 0.2 mi upstream from Rattlesnake Creek, 1.1 mi upstream from Big Branch, 2.1 mi east of Big Cedar, and at mile 157.6.

DRAINAGE AREA.--40.1 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 886.97 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good.

AVERAGE DISCHARGE.--21 years, 79.9 ft<sup>3</sup>/s, 27.06 in/yr, 57,890 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,500 ft<sup>3</sup>/s, Dec. 10, 1971, gage height, 17.08 ft; from rating curve extended above 9,000 ft<sup>3</sup>/s; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft<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)
Nov. 28	0245	*16,200	*16.34	Apr. 19	2045	4,130	10.92
Feb. 3	0845	2,440	9.39	May 17	0630	2,890	9.88
Feb. 6	0615	2,210	9.09	June 5	1215	9,040	13.70

No flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1.6	64	217	16	15	18	15	43	7.9	2.5	.00	.00		
2	1.3	50	260	15	14	17	16	38	74	1.9	.00	.00		
3	1.3	40	204	13	1300	15	16	29	242	1.2	.00	.00		
4	1.3	32	166	13	944	14	140	23	243	.82	.00	.00		
5	1.1	25	159	12	337	12	288	19	2250	.62	.00	.01		
6	.85	22	82	11	1190	12	176	16	649	.50	.00	.00		
7	.77	18	70	11	433	11	127	13	365	.36	.00	.00		
8	.68	15	61	9.7	309	9.4	100	11	258	.29	.00	.00		
9	.72	15	52	9.1	224	9.7	77	8.5	178	.23	.00	.00		
10	.83	15	48	8.7	175	15	62	20	122	.18	.00	.00		
11	.95	13	157	8.1	137	15	56	13	148	.14	.00	.00		
12	1.1	13	271	7.8	111	99	140	8.8	88	.10	.00	.00		
13	1.1	15	194	7.4	94	67	110	6.3	57	.06	.00	.00		
14	1.4	14	133	7.3	87	59	137	6.0	38	.04	.00	.00		
15	1.6	23	99	7.0	76	58	112	316	25	.00	.00	.00		
16	1.6	340	84	8.0	68	61	92	121	24	.00	.00	.00		
17	1.6	171	72	38	61	52	77	1130	14	.00	.00	.00		
18	6.9	421	62	29	54	56	82	362	8.7	.00	.00	.00		
19	34	451	54	27	48	50	1230	188	5.9	.00	.00	.00		
20	22	388	48	26	44	44	822	109	4.1	.00	.00	.00		
21	16	246	43	26	39	40	291	70	2.9	.00	.00	.00		
22	13	173	39	25	35	37	175	48	2.1	.00	.00	.00		
23	12	132	35	23	32	34	118	34	1.9	.00	.00	.00		
24	10	105	32	22	28	31	85	82	1.7	.00	.00	.00		
25	9.3	87	28	22	26	27	64	62	24	.00	.00	.00		
26	8.8	86	26	21	25	25	50	43	6.7	.00	.00	.00		
27	9.9	2540	24	18	22	23	46	31	3.1	.00	.00	.00		
28	24	4450	22	18	20	20	41	22	6.8	.00	.00	.00		
29	86	573	21	18	---	19	28	14	9.1	.00	.00	.00		
30	49	304	19	16	---	16	22	9.4	4.1	.00	.00	.00		
31	71	---	18	14	---	14	---	7.0	---	.00	.00	---		
TOTAL	391.90	10841	2800	507.1	5948	980.1	4795	2903.0	4864.0	8.94	.00	.01		
MEAN	12.6	361	90.3	16.4	212	31.6	160	93.6	162	.29	.00	.00		
MAX	86	4450	271	38	1300	99	1230	1130	2250	2.5	.00	.01		
MIN	.68	13	18	7.0	14	9.4	15	6.0	1.7	.00	.00	.00		
CFSM	.31	9.00	2.25	.41	5.29	.79	3.99	2.33	4.04	.01	.00	.00		
IN.	.36	10.06	2.60	.47	5.52	.91	4.45	2.69	4.51	.01	.00	.00		
AC-FT	777	21500	5550	1010	11800	1940	9510	5760	9650	18	.00	.02		
CAL YR 1985	TOTAL	40540.74	MEAN	111	MAX	4450	MIN	.03	CFSM	2.77	IN.	37.61	AC-FT	80410
WTR YR 1986	TOTAL	34039.05	MEAN	93.3	MAX	4450	MIN	.00	CFSM	2.33	IN.	31.58	AC-FT	67520



## RED RIVER BASIN

295

07335700 KIAMICHI RIVER NEAR BIG CEDAR, OK--Continued  
(Hydrologic bench-mark station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1966 to current year.

REMARKS.--Samples were collected quarterly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

		AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	
NOV 05...	1000	1028	80020	3.51	26	24	13.0	8.0	7.1	755	10.8	
DEC 05...	1200	1028	80020	4.12	92	28	17.0	10.0	5.6	747	10.7	
JAN 31...	1300	1028	80020	3.47	15	23	10.0	8.5	4.7	739	11.2	
MAR 13...	1130	1028	80020	3.96	62	*26	20.0	12.0	13	733	--	
APR 23...	1200	1028	80020	4.35	120	*25	23.0	14.0	19	738	9.8	
JUN 03...	1200	1028	80020	4.09	60	26	25.0	20.0	9.5	735	8.4	
DATE		OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCEI FECAL, KF AGAR (COLS./ PER 100 ML)	HARD-NESS (MG/L AS CAC03)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
NOV 05...	92	--	--	--	5	1	0.90	0.70	2.0	41	0.4	0.90
DEC 05...	97	K270	68	5	1	1.1	0.63	1.8	38	0.3	0.80	
JAN 31...	99	K17	K10	6	2	1.0	0.80	2.2	42	0.4	0.70	
MAR 13...	--	--	--	--	6	2	1.1	0.70	1.9	38	0.4	0.80
APR 23...	98	120	93	6	1	1.1	0.70	2.0	40	0.4	0.70	
JUN 03...	96	--	--	--	6	0	1.2	0.80	3.2	49	0.6	0.80
DATE		SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITU-ENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS NO2)
NOV 05...	5.6	2.0	<0.10	8.5	27	23	0.04	1.9	--	--	--	
DEC 05...	4.9	1.9	<0.10	8.0	30	22	0.04	7.5	--	--	--	
JAN 31...	5.3	1.7	<0.10	7.3	19	22	0.03	0.75	--	<0.010	--	
MAR 13...	6.4	1.8	<0.10	7.9	27	23	0.04	4.5	--	<0.010	--	
APR 23...	5.1	1.5	<0.10	8.1	39	22	0.05	13	0.460	0.021	0.07	
JUN 03...	4.2	1.6	<0.10	8.1	27	24	0.04	4.4	--	<0.010	--	

\* SPECIFIC CONDUCTANCE, LAB (US/CM)

## RED RIVER BASIN

07335700 KIAMICHI RIVER NEAR BIG CEDAR, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)
NOV 05...	--	--	--	--	--	--	--	--	--	--	90
DEC 05...	--	--	--	--	--	--	--	--	--	--	190
JAN 31...	<0.100	0.020	0.010	0.01	0.18	0.20	<0.010	<0.010	<0.010	--	70
MAR 13...	<0.100	<0.010	0.020	0.03	--	<0.20	0.020	0.010	<0.010	--	120
APR 23...	0.481	0.021	0.061	0.08	0.58	0.60	0.031	0.031	0.010	0.03	--
JUN 03...	<0.100	0.040	<0.010	--	0.26	0.30	0.020	<0.010	<0.010	--	100
DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
NOV 05...	<1	21	<0.5	<1	4	<3	2	140	<1	<4	8
DEC 05...	<1	22	<0.5	3	1	<3	3	62	1	<4	10
JAN 31...	<1	23	<0.5	<1	<1	<3	<1	91	1	<4	--
MAR 13...	<1	11	<0.5	1	<1	<3	<1	120	5	<4	4
APR 23...	--	--	--	--	--	--	--	--	--	--	--
JUN 03...	<1	11	<0.5	1	<1	<3	--	69	<1	<4	5
DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 05...	0.2	<10	13	<1	<1	10	<6	7	4	0.28	56
DEC 05...	<0.1	<10	2	<1	<1	11	<6	29	8	2.0	38
JAN 31...	<0.1	<10	3	<1	1	10	<6	9	0	0.02	79
MAR 13...	--	<10	<1	1	1	11	<6	7	18	3.0	68
APR 23...	--	--	--	--	--	--	--	--	22	7.1	77
JUN 03...	0.1	<10	3	<1	<1	12	<6	6	6	0.97	84

## RED RIVER BASIN

297

07335775 SARDIS LAKE NEAR CLAYTON, OK

LOCATION.--Lat 34°37'45", long 95°21'03", in NE 1/4 SW 1/4 sec.19, T.2 N, R.19 E., Pushmataha County, Hydrologic Unit 11140105, on the northeast end of parking area on top of dam, 2.5 mi north of Clayton, and at mile 2.8.

DRAINAGE AREA.--275 mi<sup>2</sup>.

PERIOD OF RECORD.--December 27, 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth dam. The controlled outlet consists of two sluice gates and the uncontrolled outlet is a concrete spillway. Flow was diverted through control structure May 4, 1981; regulated storage began Dec. 27, 1982; conservation pool first filled Oct. 20, 1984. Capacity, 735,800 acre-ft at elevation 624.0 ft, maximum pool; 468,100 acre-ft, at elevation 611.0 ft, spillway crest; 396,900 acre-ft at elevation 607.0 ft, top of flood pool; 274,300 acre-ft, at elevation 599.0 ft, top of conservation pool. Figures given herein represent total contents. Reservoir is designed for flood control, water supply, water-quality control and conservation. Capacity table used since Dec. 27, 1982.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 345,400 acre-ft, Oct. 28, 1984, elevation, 603.84 ft; minimum since conservation pool was first filled, 219,200 acre-ft, Oct. 9-12, 1985, elevation, 594.65 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 329,600 acre-ft, May 27, elevation, 602.82 ft; minimum contents, 219,200 acre-ft, Oct. 9-12, elevation, 594.65 ft.

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

592	189,100	598	260,900
594	211,600	601	302,500
596	235,500	604	347,900

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	221100	226800	280100	236500	236000	272300	276400	274600	298000	276100	268200	265800
2	221000	226800	277100	236200	236700	272200	277100	274600	289600	276000	268000	265800
3	220900	226800	272700	236200	242100	272200	279300	274600	284800	276100	267600	266700
4	220800	226800	269200	236400	245200	272200	286500	274600	280600	261700	267500	268200
5	220200	226800	263800	236400	247200	272300	293000	274200	288600	261500	267900	268800
6	219800	226800	258800	236100	252900	272200	298900	274500	292500	261500	268700	269000
7	219500	226800	254000	236100	263600	272200	299600	274600	292600	261300	268600	269200
8	219400	238300	249300	236100	265000	272400	296000	275000	291300	261200	268400	269200
9	219200	226200	245200	236100	266500	272400	292500	276000	288500	260900	268600	268700
10	219400	226400	241200	236100	267700	272600	290600	278400	284000	273800	268700	268200
11	219200	226400	236900	236200	268100	272700	284300	279100	280100	273400	268600	269500
12	219400	226400	234400	236200	268500	283300	284500	279100	276800	273100	268300	268200
13	219500	226400	234300	236200	269700	284400	280500	277100	276900	273000	268200	268000
14	219900	227800	234300	236100	270700	283100	279800	278800	276500	273000	268200	267900
15	220100	238700	234300	236100	270800	281200	277100	300900	275100	272600	268400	267800
16	220100	240400	234600	236200	270900	281200	274600	302400	278400	272300	268300	267800
17	220100	245700	235000	236500	271300	279800	273100	309700	279800	272000	268200	267600
18	223400	264900	235400	236700	271400	281200	273200	314100	279700	271600	268200	267600
19	224200	273200	235400	236700	272000	279300	295000	315000	279100	271300	268600	267500
20	224400	274100	235500	236400	272000	277200	303800	312000	277700	271500	268400	267400
21	224400	274300	235500	236700	272000	276000	305400	306000	277100	271200	268600	267200
22	224400	269600	235900	236700	272200	275700	304400	298800	276400	271100	267900	267100
23	224400	268600	236400	236400	272400	275600	300200	294200	275600	271100	267600	267000
24	224400	258800	236400	236100	272300	275100	294300	318400	275100	270800	267400	266400
25	224400	256000	236200	236400	272300	274700	289800	325500	276000	270700	267000	266400
26	224400	266400	235700	236500	272600	274500	285100	329100	276000	270500	266600	266400
27	224400	277500	235600	236200	272600	274500	281200	329600	276100	270100	267200	266400
28	225800	279900	235700	235900	272400	274500	277200	327600	276900	269600	267000	266000
29	226500	279500	235900	235900	---	274500	275100	320400	276500	269500	266600	265800
30	226800	279300	236200	235900	---	274500	274700	313100	276100	268900	266200	265500
31	226800	---	236500	235900	---	274900	---	305000	---	268400	265900	---
MAX	226800	279900	280100	236700	272600	284400	305400	329600	298000	276100	268700	269500
MIN	219200	226200	234300	235900	236000	272200	273100	274200	275100	260900	265900	265500
(+)	595.28	599.36	596.08	596.03	598.86	599.04	599.03	601.24	599.13	598.56	598.37	598.34
(++)	+4,800	+52,500	-42,800	-600	+36,500	+2,500	-200	+30,300	-28,900	-7,000	-2,500	-400
CAL YR 1985	MAX	280100	MIN	219200	(++)	-13,100						
WTR YR 1986	MAX	329600	MIN	219200	(++)	+43,500						

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

LOCATION.--Lat 34°34'30", long 95°20'26", in NE 1/4 SE 1/4 sec.7, T.1 N., R.19 E., Pushmataha County, Hydrologic Unit 11140105, on left bank near downstream bridge abutment on U.S. Highway 271, approximately 1 mi southeast of Clayton, and at mile 101.6.

PERIOD OF RECORD.--November 1980 to current year.

REMARKS.--Estimated daily discharges: Oct. 16-21. Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation since December 1982, by Sardis Lake (station 07335775), on Jack Fork Creek 4.5 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,800 ft<sup>3</sup>/s, June 7, 1981, gage height, 20.21 ft; no flow Oct. 3-18, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 21,300 ft<sup>3</sup>/s, Nov. 28, gage height, 18.41 ft; minimum daily discharge, 2.0 ft<sup>3</sup>/s, Aug. 23.

[illegible]

## 07336200 KIAMICHI RIVER NEAR ANTLERS, OK

LOCATION.--Lat 34°14'55", long 95°36'18", in SW 1/4 sec.35, T.3 S., R.16 E., Pushmataha County, Hydrologic Unit 11140105, on right bank, 50 ft downstream from bridge on U.S. Highway 271 and State Highway 2, 2.0 mi northeast of Antlers, 7.7 mi downstream from Tenmile Creek, 5.4 mi upstream from Cedar Creek and at mile 59.6.

DRAINAGE AREA.--1,138 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Datum of gage is 419.82 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Estimate daily discharges: Oct. 28, Dec. 2-3, Jan. 6-8, and May 17. Records good. Small diversion above station for municipal water supply of city of Antlers.

COOPERATION.--Gage-height record, 7 discharge measurements furnished by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--14 years, 1,558 ft<sup>3</sup>/s, 18.59 in/yr, 1,129,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,000 ft<sup>3</sup>/s, Mar. 28, 1977, gage height, 38.33 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 18,000 ft<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)
Nov. 27	1700	24,600	25.52	May 25	0500	20,300	22.78
Apr. 20	0800	*28,400	*27.39				

Minimum daily discharge, 4.0 ft<sup>3</sup>/s, Aug. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	512	8930	230	109	241	233	1170	5360	147	15	4.7
2	16	350	6400	218	109	227	363	1910	5310	180	13	4.7
3	15	290	5200	209	6310	215	625	1350	6690	126	13	4.33
4	11	240	4900	200	10000	204	4350	697	6920	96	11	1130
5	9.4	193	4390	195	5730	194	7580	482	6610	87	9.2	3140
6	8.4	158	4080	188	10900	189	5540	386	9500	79	8.1	2290
7	7.1	131	3810	180	14300	181	2440	328	6710	69	7.8	846
8	6.4	108	3640	175	7350	171	2770	1110	6620	60	7.8	438
9	6.4	90	3530	168	3900	165	3220	694	6980	54	7.8	274
10	5.8	79	3570	162	2700	166	3070	3640	5590	47	7.3	195
11	5.1	72	3860	157	2010	179	2910	3600	5140	38	6.8	146
12	4.7	65	4450	150	1510	3030	2730	1760	4550	36	6.8	110
13	4.4	62	2750	147	1220	2260	4160	1350	2460	34	6.8	85
14	5.4	58	1380	143	1020	1920	3050	1480	1250	30	6.2	66
15	8.4	1940	985	135	903	1870	2710	10800	713	27	5.7	56
16	9.3	4090	836	129	810	1930	2500	13300	1440	24	24	55
17	10	3080	752	128	731	1820	1880	10300	4320	22	15	64
18	832	9920	662	128	655	2650	1040	11200	1430	20	8.4	47
19	1850	15000	580	128	584	3760	8890	6910	977	18	9.0	39
20	788	15000	521	128	517	2940	26700	3850	765	15	8.9	37
21	591	8380	473	131	456	2410	18200	4220	649	15	7.6	31
22	329	4090	436	160	409	1320	5050	4460	578	25	6.3	26
23	222	4060	408	158	366	857	3610	4290	539	18	5.8	25
24	166	3780	377	150	339	763	4210	6800	493	20	4.8	21
25	127	3560	347	142	316	683	4070	15300	258	19	4.5	19
26	96	7810	317	133	294	625	3220	5050	196	16	4.0	17
27	63	22700	287	125	275	582	2970	2550	209	13	16	14
28	50	21200	268	122	256	502	2850	2140	204	10	31	13
29	1680	19400	256	120	---	316	2290	3460	160	17	14	11
30	1400	6980	248	119	---	273	1260	4120	154	18	7.7	10
31	860	---	237	112	---	249	---	4710	---	17	5.2	---
TOTAL	9202.8	153398	68880	4770	74079	32892	134491	133417	92775	1397	304.5	9647.4
MEAN	297	5113	2222	154	2646	1061	4483	4304	3092	45.1	9.82	322
MAX	1850	22700	8930	230	14300	3760	26700	15300	9500	180	31	3140
MIN	4.4	58	237	112	109	165	233	328	154	10	4.0	4.7
AC-FT	18250	304300	136600	9460	146900	65240	266800	264600	184000	2770	604	19140
CAL YR 1985	TOTAL 741033.2	MEAN 2030	MAX 22700	MIN 1.2	AC-FT 1470000							
WTR YR 1986	TOTAL 715252.4	MEAN 1960	MAX 26700	MIN 4.0	AC-FT 1419000							

## RED RIVER BASIN

07336600 HUGO LAKE NEAR HUGO, OK

LOCATION.--Lat 34°00'42", long 95°22'49", in NW 1/4 SW 1/4 sec.25, T.6 S., R.18 E., Choctaw County, Hydrologic Unit 11140105, on upstream face of Hugo Dam on Kiamichi River, 700 ft to left of spillway, 7.0 mi east of Hugo, and at mile 17.6.

DRAINAGE AREA.--1,709 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by rolled earth dam. The outlet works consists of a gate-controlled concrete gravity ogee-type weir with six 40- by 50-foot gates. Regulated storage began Jan. 18, 1974; conservation pool was first filled Mar. 12, 1974. Total capacity, 1,561,500 acre-ft, at elevation 452.5 ft, top of dam, 966,700 acre-ft, at elevation 437.5 ft, top of flood control pool. Dead storage 21,080 acre-ft, at elevation 387.5 ft, crest of gated spillway. Figures given herein represent total contents. Reservoir is used for flood control, water supply, recreation and conservation.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 577,800 acre-ft, June 17, 1982, elevation, 425.00 ft; minimum since conservation pool was first filled, 88,860 acre-ft, Nov. 15, 1978, elevation, 398.47 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 351,300 acre-ft, Apr. 22, elevation, 415.83 ft; minimum, 118,200 acre-ft, Oct. 17, elevation, 401.29 ft.

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

401	115,000	415	334,000
407	192,700	420	447,100
410	239,900	425	577,800

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	121300	158500	309100	158100	158900	159400	157700	167700	183200	158800	143400	128800
2	120900	159300	302700	158500	159300	160200	157300	163400	177500	159400	143100	128600
3	120400	159700	287800	159300	195400	160800	160200	163500	173700	159300	142500	131400
4	120600	160100	271000	159800	230700	161100	186500	161300	173000	158800	142200	142200
5	120300	160200	253400	159700	249500	161300	205700	159200	170000	158600	141000	166500
6	119800	160900	234600	159800	282800	161300	221100	157700	174500	158100	140600	176500
7	119000	160700	217300	160700	306600	161200	221100	158200	172200	158000	139800	180600
8	118900	160200	199400	160500	308300	161600	213400	159600	166500	157400	139400	177400
9	118800	160200	183400	160700	300400	161300	202400	160900	162500	156900	138600	171500
10	118900	161100	174400	160900	287400	162700	188300	171100	162500	156200	138400	164700
11	118900	160500	168000	161100	269200	163400	178600	181300	166700	155500	137900	160900
12	118700	160700	163200	161300	250900	167300	174200	183400	170300	155000	137200	159600
13	118200	160700	162000	161500	230800	166700	171500	178600	170300	154600	136400	158100
14	120900	162300	160700	161600	216000	165000	167300	173000	169100	154000	135800	156300
15	121000	177800	158500	161700	203600	165700	161600	184600	165900	153400	136100	155500
16	121000	186200	157800	162100	191500	166200	157600	198700	172100	152700	135400	155700
17	121000	196400	159300	162400	179700	165800	156700	211800	181300	152100	135700	155700
18	122900	222900	160500	162900	167700	171100	158000	226500	181200	151700	135100	155500
19	132300	257800	161700	162900	161500	173800	210800	229200	178900	151100	134500	155300
20	137200	268700	162100	163200	162000	174200	297900	213600	176100	150600	133700	154800
21	138400	268000	162700	164000	160800	172900	344400	197600	173000	149900	133100	154700
22	137700	253900	163600	163500	159600	170000	345400	186500	169700	149600	132400	154400
23	138000	239900	164600	162300	158600	165900	327200	179800	166500	149100	131300	154000
24	138400	226000	163800	162000	158100	161100	306800	197900	162700	148600	131000	153200
25	138600	211900	160500	161600	158000	158200	286700	236500	160400	147900	130700	153000
26	138900	214800	158900	162000	159400	158500	264700	242000	159600	147500	129500	152600
27	139000	260600	159200	159800	160500	158200	244600	232800	158900	146700	130500	152400
28	140500	289700	158600	158600	159300	158600	222900	215700	159000	146300	130900	152000
29	149200	308100	158200	158500	---	158600	201200	201000	159000	145600	130700	151300
30	155400	309500	157700	158800	---	158200	182800	188300	158800	144800	129900	151100
31	157100	---	157800	158600	---	158000	---	180400	---	144200	129300	---
MAX	157100	309500	309100	164000	308300	174200	345400	242000	183200	159400	143400	180600
MIN	118200	158500	157700	158100	158000	158000	156700	157700	158800	144200	129300	128600
(+)	404.47	413.80	404.52	404.58	404.63	404.53	406.33	406.17	404.59	403.47	402.26	404.02
(++)	+35,100	+152,400	-151,700	+800	+700	-1,300	+24,800	-2,400	+21,600	-14,600	-14,900	+21,800
CAL YR 1985	MAX	390300	MIN	118200	(++)	-22,300						
WTR YR 1986	MAX	345400	MIN	118200	(++)	+29,100						

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET



## 301

LOCATION.--Lat 33°41'15", long 94°41'39", Bowie County, TX-McCurtain County, OK line, Hydrologic Unit 11140106, near left bank at downstream side of bridge on U.S. Highway 259, 4.8 mi upstream from North Mill Creek, 13 mi north of De Kalb, and at mile 556.9.

DRAINAGE AREA.--47,348 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 302.92 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. At times, flood peaks may be affected by storage in Lake Texoma (station 07331500) located approximately 169 mi upstream, and low flows may be affected by releases for generation of electric power. Gage-height telemeter located at station.

AVERAGE DISCHARGE.--18 years (water years 1969-86), 12,060 ft<sup>3</sup>/s, 8,737,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 189,000 ft<sup>3</sup>/s, Dec. 11, 1971, gage height, 31.55 ft, from graph based on gage readings; minimum, 213 ft<sup>3</sup>/s, Nov. 30, 1979, from graph based on gage readings.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since 1957, 205,000 ft<sup>3</sup>/s, June 1957, gage height, 32.2 ft, from rating curve extended above 186,500 ft<sup>3</sup>/s. The greatest flood since 1936 occurred in February 1938, stage unknown.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 65,000 ft<sup>3</sup>/s, June 7 at 0400 hours, gage height, 23.14 ft; minimum daily, 767 ft<sup>3</sup>/s, Oct. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1430	22100	40800	2880	2130	2580	3280	26300	28200	9340	4280	2530
2	1160	19100	39300	2230	1900	2470	2800	21400	33700	9870	4240	2240
3	1010	18800	36300	2010	2170	3170	2450	17300	36900	10800	4320	1650
4	943	17000	35000	2010	23900	3860	8620	16600	39400	9690	5120	1550
5	901	14400	35200	1770	51900	3440	24600	17700	45900	10100	5390	1880
6	844	13100	31400	1840	44900	2940	36500	17800	56000	10200	5100	2630
7	792	12700	26500	2220	41000	2940	36000	15400	62700	9050	4820	6180
8	767	11500	22800	2260	42900	2910	30700	12400	52600	8220	4780	13200
9	769	8830	21200	2320	38900	2840	29100	9620	49100	7830	4490	17200
10	779	8010	20100	3830	33200	2360	23900	7530	53900	7610	4080	14900
11	788	7820	26200	4840	29000	2430	24000	7800	57400	6620	4110	10900
12	799	6430	25900	4830	25400	2750	20400	9010	50300	5970	3940	10600
13	1290	5410	22300	4200	23000	2640	15900	11000	44800	5780	3880	9220
14	1750	6240	19900	3330	21800	4980	14400	14300	37400	5670	3720	8600
15	2780	7410	17400	2250	18400	6700	13900	14000	29300	5590	3950	8390
16	3400	13500	14600	1760	14700	6890	13500	14300	23200	5520	4440	8130
17	3090	24900	10300	2120	13500	7860	12400	21300	21300	5440	4600	7840
18	2820	30500	7690	2440	12100	8310	9050	32200	25800	5400	4870	7920
19	3030	34700	6670	2470	10700	7980	7660	39000	33000	5350	5170	8470
20	4810	43300	6410	2440	8540	7690	14300	43800	30700	5180	3880	8720
21	10800	40900	5930	2220	5930	10900	31200	41500	24200	4740	3660	8990
22	14500	38200	5460	1740	5110	12700	36900	37700	23200	4330	3360	9270
23	15100	34900	5080	1440	4160	11100	37100	34300	25300	2930	3110	9420
24	14000	31300	4750	1970	3810	10600	37500	28900	24900	2350	3040	9420
25	12700	26400	4550	2530	4460	8340	38400	29700	24300	3260	2460	9460
26	11900	25000	4960	3160	4250	5700	35600	37500	25500	4120	2190	11100
27	11600	31500	4900	3800	3280	3990	31300	35200	21300	4250	2030	12100
28	11600	41600	4350	3480	3170	4920	28000	32400	15700	4250	1630	12100
29	11800	43300	4060	2750	---	4690	28500	32100	12400	4230	1660	11900
30	13300	42300	3870	2260	---	4000	28600	29200	10800	4210	2360	9370
31	20500	---	3390	2720	---	3590	---	27700	---	4220	2550	---
TOTAL	181752	681150	517270	82120	494210	168270	676560	734960	1019200	192120	117230	255880
MEAN	5863	22710	16690	2649	17650	5428	22550	23710	33970	6197	3782	8529
MAX	20500	43300	40800	4840	51900	12100	38400	43800	62700	10800	5390	17200
MIN	767	5410	3390	1440	1900	2360	2450	7530	10800	2350	1630	1550
AC-FT	360500	1351000	1026000	162900	980300	333800	1342000	1458000	2022000	381100	232500	507500
CAL YR 1985	TOTAL 7574532 MEAN 20750 MAX 63200 MIN 767 AC-FT 15024000											
WTR YR 1986	TOTAL 5120722 MEAN 14030 MAX 62700 AC-FT 10157000											

07336820 RED RIVER NEAR DE KALB, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January 1968 to current year. Pesticide analyses: October 1970 to September 1981.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: January 1968 to current year.

WATER TEMPERATURES: January 1968 to current year.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationship between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,140 microsiemens, July 13, 1980; minimum daily, 114 microsiemens, Oct. 31, 1984.

WATER TEMPERATURES: Maximum daily, 34.0 °C on several days during July and August 1969-70; minimum daily, 0.0 °C, Jan. 11, 1977.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,660 microsiemens, Sept. 30; minimum daily, 217 microsiemens, Apr. 24.

WATER TEMPERATURES: Maximum daily, 30.0 °C on several days during July and August.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	
NOV	19...	1230	33800	610	7.80	16.0	55	170	8.4	85	1.4	140	66
FEB	19...	1520	10700	283	7.60	13.0	70	46	--	--	0.8	78	25
APR	01...	1600	3270	998	8.20	20.5	25	10	8.5	95	2.4	230	89
MAY	20...	1900	44700	371	7.80	21.0	100	150	8.8	99	2.2	97	33
JUL	09...	0745	7600	1280	8.40	29.0	10	7.0	7.2	--	2.2	290	140
AUG	26...	1330	2150	1150	8.20	30.5	20	20	8.2	--	3.7	270	110
DATE		CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WH WAT TOTAL FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDED (MG/L)
NOV	19...	40	9.9	64	2	3.9	75	66	100	0.2	4.3	330	470
FEB	19...	22	5.5	25	1	2.3	53	30	34	<0.1	8.4	160	80
APR	01...	65	17	100	3	4.1	143	110	150	0.2	4.0	540	35
MAY	20...	29	5.9	31	1	2.7	64	38	43	0.2	5.6	190	482
JUL	09...	78	22	140	4	4.7	143	150	230	0.3	2.8	710	81
AUG	26...	72	22	130	4	4.4	156	140	190	0.3	5.9	660	26
DATE		SOLIDS, VOLA- TILE, SUS- PENDED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV	19...	28	0.17	0.03	0.20	0.10	0.7	0.8	0.08	7.1	--	--	--
FEB	19...	7	0.28	0.02	0.30	0.05	0.45	0.5	0.07	9.5	--	--	--
APR	01...	11	--	<0.01	<0.10	0.02	0.68	0.7	0.05	8.9	50	441	67
MAY	20...	48	0.26	0.04	0.30	0.06	0.74	0.8	0.18	14	1540	186000	51
JUL	09...	--	--	<0.01	<0.10	0.06	0.44	0.5	0.09	6.0	638	13100	15
AUG	26...	3	--	<0.01	<0.10	0.02	0.48	0.5	0.09	9.4	52	302	73

## RED RIVER BASIN

303

07336820 RED RIVER NEAR DE KALB, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 19...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 19...	<1	70	2	<10	2	40	9	36	0.1	<1	<1	22
APR 01...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 20...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 09...	1	140	1	<10	1	8	<5	4	0.1	<1	1	32
AUG 26...	--	--	--	--	--	--	--	--	--	--	--	--

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1985 TO SEPTEMBER 1986

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (US/CM)	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. 1985	181752	1100	624	306000	190	91700	130	65700	260
NOV. 1985	681150	669	375	689000	100	190600	76	139400	170
DEC. 1985	517270	478	266	371000	69	96800	52	71900	130
JAN. 1986	82120	1060	602	134000	180	39500	130	28400	260
FEB. 1986	494210	369	204	273000	52	68800	39	51600	100
MAR. 1986	168270	812	456	207000	130	58100	93	42300	210
APR. 1986	676560	495	275	503000	72	131400	53	97600	130
MAY 1986	734960	574	320	635000	85	169300	63	125100	150
JUNE 1986	1019200	799	449	1235E3	130	348400	92	253500	200
JULY 1986	192120	1210	689	358000	210	109100	150	77800	280
AUG. 1986	117230	1310	744	235000	230	73100	160	52000	300
SEPT 1986	255880	1150	654	452000	200	141300	150	100200	260
TOTAL	5120722	**	**	5399000	**	1518000	**	1105000	**
WTD. AVG.	14030	695	390	**	110	**	80	**	180

## RED RIVER BASIN

07336820 RED RIVER NEAR DE KALB, TX--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
EQUIVALENT MEAN

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1090	912	385	961	1410	992	1010	676	745	1040	1350	1050
2	982	914	391	828	1370	1010	1050	698	637	1260	1400	1200
3	950	915	398	811	1160	872	1090	727	620	1080	1390	1250
4	918	917	342	870	590	990	517	758	640	1190	1380	1100
5	905	1040	383	929	305	1230	365	786	633	940	1410	1000
6	925	1170	341	872	275	1130	335	828	540	915	1380	858
7	938	1200	298	950	267	1140	330	845	433	1110	1310	790
8	917	1220	325	1060	298	1120	645	1040	465	1250	1320	650
9	930	1230	354	1180	270	1110	681	1160	503	1290	1340	635
10	912	1250	355	1270	244	1130	701	998	678	1370	1300	416
11	909	1280	318	1250	320	794	524	1030	710	1340	1280	240
12	937	1290	344	1260	316	968	600	972	778	1280	1340	244
13	1000	1170	348	1240	356	1070	685	880	805	1300	1380	750
14	1040	1200	772	1190	373	940	737	564	895	1320	1390	1060
15	1060	1340	760	1150	425	698	758	339	960	1290	1360	1230
16	1160	1280	748	1050	405	582	768	370	1030	1300	1380	1250
17	1200	850	776	967	387	559	780	335	1040	1280	1350	1350
18	1270	680	747	1100	373	545	896	330	1030	1300	1340	1330
19	1210	662	778	1110	309	626	1010	326	1020	1320	1330	1300
20	1120	518	838	1130	595	680	776	323	709	1330	1260	1330
21	900	475	883	1210	620	567	459	330	895	1290	1100	1440
22	842	432	890	1240	643	700	324	334	1120	1270	1320	1640
23	837	414	904	1300	642	876	259	438	1210	1300	1280	1630
24	947	445	929	1110	640	790	217	515	1240	1270	1220	1620
25	1080	478	975	905	554	835	332	640	1280	1120	1170	1590
26	1200	538	962	868	864	910	345	600	1330	1090	1150	1600
27	1320	495	950	840	870	995	375	625	1170	1190	1190	1530
28	1370	435	915	853	925	860	395	638	1130	1310	1180	1570
29	1400	415	863	975	---	904	607	641	1200	1330	1100	1640
30	1440	378	838	1090	---	925	668	702	1280	1340	1010	1660
31	1010	---	900	1040	---	965	---	730	---	1350	970	---
MEAN	1060	851	645	1050	565	888	608	651	891	1240	1280	1170
WTR YR 1986		MEAN	911	MAX	1660	MIN	217					

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.0	15.0	---	7.0	10.0	10.0	20.0	19.0	---	28.0	30.0	---
2	15.0	---	---	7.0	15.0	---	---	---	23.0	27.0	---	23.0
3	17.0	---	7.0	8.0	15.0	12.0	---	---	23.0	27.0	---	23.0
4	18.0	14.0	7.0	8.0	15.0	12.0	18.0	---	27.0	---	27.0	24.0
5	17.0	13.0	7.0	7.0	14.0	12.0	---	20.0	23.0	---	27.0	24.0
6	---	15.0	7.0	6.0	13.0	12.0	20.0	20.0	23.0	---	27.0	24.0
7	18.0	15.0	7.0	---	11.0	---	20.0	21.0	24.0	27.0	27.0	---
8	17.0	15.0	---	---	9.0	12.0	20.0	21.0	---	28.0	---	---
9	19.0	15.0	11.0	5.0	---	---	18.0	21.0	25.0	28.0	27.0	23.0
10	21.0	---	11.0	5.0	7.0	15.0	18.0	22.0	25.0	30.0	26.0	23.0
11	21.0	17.0	10.0	5.0	6.0	16.0	19.0	---	24.0	28.0	---	25.0
12	22.0	17.0	8.0	---	6.0	15.0	---	23.0	25.0	28.0	27.0	24.0
13	---	18.0	8.0	6.0	6.0	15.0	---	23.0	---	28.0	26.0	24.0
14	23.0	18.0	5.0	8.0	6.0	16.0	19.0	24.0	---	28.0	27.0	---
15	23.0	18.0	---	8.0	6.0	15.0	17.0	22.0	---	28.0	27.0	24.0
16	21.0	15.0	5.0	9.0	---	14.0	17.0	23.0	25.0	28.0	27.0	24.0
17	---	---	5.0	11.0	11.0	15.0	17.0	---	25.0	28.0	---	---
18	---	15.0	5.0	10.0	10.0	15.0	16.0	---	25.0	28.0	---	25.0
19	---	16.0	4.0	10.0	11.0	14.0	---	19.0	24.0	---	28.0	---
20	---	15.0	5.0	---	11.0	13.0	16.0	19.0	25.0	29.0	29.0	25.0
21	---	13.0	5.0	---	---	12.0	16.0	---	---	29.0	28.0	25.0
22	20.0	13.0	---	---	11.0	---	16.0	20.0	---	29.0	28.0	25.0
23	21.0	13.0	---	---	---	13.0	16.0	21.0	27.0	29.0	---	25.0
24	21.0	---	---	---	11.0	14.0	17.0	---	27.0	30.0	---	---
25	21.0	13.0	---	---	11.0	---	18.0	---	---	30.0	28.0	25.0
26	20.0	15.0	4.0	---	11.0	---	---	---	26.0	30.0	28.0	25.0
27	---	15.0	---	---	12.0	---	---	21.0	26.0	---	28.0	---
28	19.0	---	---	---	---	---	18.0	---	---	30.0	27.0	---
29	17.0	12.0	---	---	---	18.0	19.0	22.0	---	30.0	24.0	25.0
30	---	12.0	7.0	---	---	---	19.0	23.0	28.0	30.0	---	---
31	15.0	---	---	---	---	18.0	---	---	---	30.0	---	---
MEAN	19.0	15.0	6.5	7.5	10.5	14.0	18.0	21.5	25.0	28.5	27.5	24.5
WTR YR 1986		MEAN	18.5	MAX	30.0	MIN	4.0					

## RED RIVER BASIN

305

07337300 PINE CREEK LAKE NEAR WRIGHT CITY, OK

LOCATION.--Lat 34°06'43", long 95°04'46", in NE 1/4 NW 1/4 sec.23, T.5 S., R.21 E., McCurtain County, Hydrologic Unit 11140107, at left of outlet works of dam on Little River, 4.7 mi upstream from bridge on State Highway 98, 5.0 mi northwest of Wright City, and at mile 145.3.

DRAINAGE AREA.--635 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1969 to current year. Prior to October 1970, published as Pine Creek Reservoir near Wright City.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by rolled earth dam; regulated storage began June 1, 1969; conservation pool was first filled Jan. 7, 1970. Total capacity, 1,136,000 acre-ft at elevation 509.0 ft, top of dam, 465,800 acre-ft at elevation 480.0 ft, crest of spillway, 53,800 acre-ft at elevation 438.0 ft top of conservation pool, 7,140 acre-ft dead storage at elevation 414.0 ft. Figures given herein represent total contents. Reservoir is designed for flood control, municipal and industrial water supply, and recreation.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 356,510 acre-ft, Nov. 4, 1984, elevation, 473.13 ft; minimum since conservation pool was first filled, 28,220 acre-ft, Oct. 21, 1972, elevation, 429.34 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 154,500 acre-ft, Feb. 8, elevation, 455.24 ft; minimum 52,870 acre-ft, Oct. 17, elevation, 437.76 ft.

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

436	46,650	448	102,600
439	57,610	462	217,470
442	70,490	474	369,400

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53750	56070	139400	53980	55410	53940	62970	76530	88620	74660	66960	60910
2	53710	56260	133000	53870	55450	54140	63610	76380	89060	76130	66560	60910
3	53570	56300	124800	53830	78570	54290	64600	76380	86920	76130	66330	62020
4	53380	56300	115700	53980	97490	54290	77480	75630	87080	75880	65840	65760
5	53350	56070	105900	53940	104900	54330	85070	74660	86150	75480	66200	84920
6	53280	54680	95680	54060	145300	54290	89930	73670	85880	74990	66020	90590
7	53170	53940	85880	54250	154200	54210	90650	73190	84400	74570	65840	92470
8	53090	53710	76180	54210	154000	54170	87910	73190	85770	73900	65710	90810
9	53130	53900	66960	54330	151500	54250	84660	73480	84240	73520	65460	86810
10	53090	54100	61270	54480	145400	54370	81210	76580	81110	72950	65150	82880
11	53060	54060	61350	54560	136000	54520	79170	80740	79970	72580	64980	78520
12	52980	54060	63700	54750	125600	54720	79270	81940	78370	72430	64680	74090
13	52950	54140	61440	54720	115600	54830	79220	79920	76280	72290	64470	69220
14	53060	54720	61440	54750	105200	55020	78670	76830	74760	72200	64210	66330
15	53020	63520	59280	54790	94640	55490	77530	82100	72770	72010	64080	63270
16	52950	69450	56720	54910	84600	56610	76130	83610	95790	71910	65280	61270
17	52950	79670	54830	54990	74230	57340	74660	95390	104500	71770	65580	60090
18	55330	98870	54060	55140	64730	58420	74140	108400	103800	71340	65460	59280
19	60870	139300	54140	55140	57850	59400	110500	133700	99230	71110	64510	58630
20	63310	138100	54520	55220	54210	60300	145300	112100	94070	70730	63310	58180
21	64170	128200	54910	55330	53980	60830	152600	106000	90150	70400	62190	57810
22	62750	120600	55290	55330	54210	61270	152300	97550	85930	70170	91520	57340
23	61070	109700	55560	55290	54290	61680	144900	88730	81630	69680	61350	56920
24	60130	100900	55490	55290	54290	62070	134300	97550	79420	69680	61270	56370
25	58910	91210	54990	55330	54290	62150	123500	104200	76730	69360	61070	55870
26	57650	97250	54520	55330	54290	62190	112500	106600	74800	69040	60990	55370
27	56570	147700	54140	55140	54060	62240	102300	105200	74050	68680	61480	54910
28	55800	151700	54140	55220	53940	62280	92350	98270	74280	68410	61400	54330
29	55410	148700	54060	55410	---	62450	84760	89550	74470	68050	61270	54100
30	56260	141600	54060	55330	---	62450	79470	83090	74570	67640	61110	54060
31	56260	---	54100	55330	---	62620	---	82200	---	67330	61030	---
MAX	64170	151700	139400	55410	154200	62620	152600	133700	104500	76130	91520	92470
MIN	52950	53710	54060	53830	53940	53940	62970	73190	72770	67330	60990	54060
(+)	438.65	453.63	438.09	438.41	438.05	440.22	443.85	444.38	442.86	441.30	439.84	438.08
(++)	+2,270	+85,340	-87,500	+1,230	-1,390	+8,680	+16,850	+2,730	-7,630	-7,240	-6,300	-6,970
CAL YR 1985	MAX	151700	MIN	52950	(++)	+80						
WTR YR 1986	MAX	154200	MIN	52950	(++)	-5,950						

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET



## RED RIVER BASIN

07337500 LITTLE RIVER NEAR WRIGHT CITY, OK

LOCATION.--Lat 34°04'10", long 95°02'47", in NE 1/4 NW 1/4 sec.6, T.6 S., R.22 E., McCurtain County, Hydrologic Unit 11140107, on left bank on downstream side of bridge on State Highway 98, 1.8 mi upstream from White Oak Creek, 2.0 mi west of Wright City, 4.7 mi downstream from Pine Creek Lake, and at mile 140.6.

DRAINAGE AREA.--645 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1929 to September 1931, October 1944 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 346.76 ft, National Geodetic Vertical Datum of 1929.

Oct. 12, 1929 to Sept. 30, 1931, nonrecording gage at railroad bridge 1.0 mi downstream at datum 4.15 ft higher. Dec. 6, 1944 to July 30, 1951, nonrecording gage at present site and datum.

REMARKS.--Estimated daily discharges: Oct. 10, Nov. 27, Feb. 3-5, Mar. 16, 17, Apr. 4, 5, 19, 20, May 15, 17, 18, June 1, and Sept. 5, 6. Records good. Except for 10 mi<sup>2</sup> intervening area, flow completely regulated since June 1969 by Pine Creek Lake (station 07337300).

COOPERATION.--Gage-height record and 4 discharge measurements furnished by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--(Prior to regulation by Pine Creek Lake) 27 years (water years 1930-31, 1945-69), 917 ft<sup>3</sup>/s, 664,400 acre-ft/yr; (since regulation by Pine Creek Lake) 16 years (water years 1971-86) 922 ft<sup>3</sup>/s, 668,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 78,200 ft<sup>3</sup>/s, May 6, 1961, gage height, 45.60 ft; maximum gage height, 45.77 ft, Sept. 16, 1950; no flow at times in 1930, 1954, 1956, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,530 ft<sup>3</sup>/s, Dec. 1, gage height, 22.12 ft; maximum gage height, 23.87 ft, Nov. 27 (from backwater); minimum daily discharge, 15 ft<sup>3</sup>/s, Jan. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	735	6480	173	16	206	55	2850	2200	83	90	30
2	43	569	6410	163	17	168	43	1810	2140	161	92	30
3	38	446	6210	146	50	143	36	1130	2590	267	92	36
4	36	390	6050	83	125	125	48	1020	2570	286	90	66
5	31	351	5900	48	350	112	50	975	2550	289	95	100
6	30	467	5780	35	653	101	115	945	2510	289	120	170
7	31	557	5690	27	1950	95	246	882	2490	289	117	255
8	30	403	5570	21	3780	90	1780	562	2480	289	107	812
9	30	206	5150	17	3720	86	2240	413	2480	289	107	1630
10	32	111	3990	17	4300	89	2220	363	2450	289	116	2000
11	36	67	3160	16	5880	88	2120	325	2500	268	123	2120
12	42	52	560	17	5940	110	1450	373	2460	123	119	2150
13	45	45	1110	18	5860	109	1260	1040	2210	65	115	2160
14	49	40	1700	20	5780	100	1190	1650	1580	46	111	2150
15	55	116	1890	21	5690	94	1150	2250	1460	39	107	1910
16	57	807	1930	21	5590	125	1140	2200	1390	36	128	1290
17	59	1480	1840	24	5490	127	1140	2300	1050	31	129	1050
18	75	2210	1370	24	5230	118	1040	1700	1700	32	133	627
19	89	2420	888	24	4050	105	900	1110	2950	54	293	503
20	103	4630	545	24	2460	131	1250	2760	3190	74	447	359
21	108	6030	429	24	965	154	1470	3930	2280	84	523	278
22	504	6050	368	21	467	168	1730	4870	2240	86	490	245
23	815	5960	321	20	363	179	4290	4860	2240	88	171	228
24	832	5850	301	21	324	182	5830	4570	2010	93	67	221
25	795	5770	347	21	303	183	5890	2780	1370	96	43	217
26	774	5790	396	20	297	184	5820	1550	1260	96	32	216
27	759	5800	415	16	287	184	5740	1930	944	94	35	211
28	754	5610	332	18	271	182	5680	3990	277	91	65	210
29	758	4980	260	17	---	134	4870	4840	161	89	49	201
30	754	6180	220	15	---	98	3260	4160	112	88	39	86
31	754	---	194	16	---	80	---	2320	---	91	33	---
TOTAL	8561	74122	75806	1148	70208	4050	64053	66458	57844	4295	4278	21561
MEAN	276	2471	2445	37.0	2507	131	2135	2144	1928	139	138	719
MAX	832	6180	6480	173	5940	206	5890	4870	3190	289	523	2160
MIN	30	40	194	15	16	80	36	325	112	31	32	30
AC-FT	16980	147000	150400	2280	139300	8030	127000	131800	114700	8520	8490	42770

CAL YR 1985 TOTAL 417684 MEAN 1144 MAX 6480 MIN 8.3 AC-FT 828500  
WTR YR 1986 TOTAL 452384 MEAN 1239 MAX 6480 MIN 15 AC-FT 897300



## RED RIVER BASIN

307

07337900 GLOVER CREEK NEAR GLOVER, OK

LOCATION.--Lat 34°05'51", long 94°54'07", in NW 1/4 NE 1/4 sec.28, T.5 S., R.23 E., McCurtain County, Hydrologic Unit 11140107, on right downstream end of bridge on State Highways 3 and 7, 2.0 mi north of Glover, 11.0 mi northwest of Broken Bow, and at mile 9.2.

DRAINAGE AREA.--315 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 378.70 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records fair.

COOPERATION.--Gage-height record and 4 discharge measurements furnished by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--25 years, 459 ft<sup>3</sup>/s, 19.79 in/yr, 332,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 98,600 ft<sup>3</sup>/s, Dec. 10, 1971, gage height, 29.72 ft; no flow at times in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1961 reached a stage of 28.84 ft, from floodmark. Flood in 1908 was higher than in May 1961, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,000 ft<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)
Nov. 15	2100	9,210	9.76	Feb. 6	1600	14,700	12.28
Nov. 18	0200	8,620	9.46	Apr. 20	0300	*21,500	*14.90
Nov. 27	0300	18,300	13.71	May 17	1700	9,540	9.92
Feb. 3	2000	14,900	12.37	June 16	1600	16,900	13.17

Minimum daily discharge, 3.5 ft<sup>3</sup>/s on Aug. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.9	261	2190	88	36	99	59	223	232	110	6.9	9.2
2	7.4	211	1180	83	36	87	59	365	450	185	5.8	8.8
3	5.7	169	673	78	5690	84	62	293	582	258	5.1	16
4	6.5	139	507	75	8100	83	1250	234	1320	198	4.1	51
5	11	116	406	73	1960	72	1750	203	632	145	3.5	586
6	10	98	338	72	7620	64	728	183	631	116	3.8	817
7	9.0	80	288	68	3160	61	449	171	1270	92	4.1	446
8	7.1	67	250	66	1260	58	348	163	1550	72	4.3	273
9	6.2	58	221	61	753	52	276	165	806	57	4.1	192
10	5.7	51	225	58	580	56	216	245	524	46	7.8	143
11	5.7	46	1940	55	456	48	187	540	494	40	7.5	118
12	5.4	41	1340	53	388	63	452	390	557	35	4.7	92
13	5.2	38	719	51	335	84	494	294	385	34	4.3	74
14	5.6	35	503	47	306	111	353	240	301	29	3.8	59
15	6.5	3130	393	46	284	104	270	856	260	25	3.6	55
16	6.5	3230	333	47	259	185	220	797	5790	21	58	50
17	6.8	3100	286	48	240	243	183	3870	2850	19	351	44
18	315	4700	251	48	220	214	166	4600	874	17	202	36
19	2870	3960	223	48	202	212	7370	2910	533	15	123	30
20	713	1310	200	50	189	215	9620	1050	392	13	73	25
21	377	647	184	55	173	177	1960	599	310	10	49	22
22	250	461	167	50	159	160	826	447	260	9.0	38	20
23	182	371	156	47	145	148	525	368	221	8.6	29	19
24	147	306	147	45	138	133	416	412	188	8.5	23	18
25	119	269	139	45	130	123	339	680	164	6.7	18	17
26	106	1270	128	42	122	112	286	478	148	16	14	16
27	82	12100	119	39	114	100	249	372	184	19	11	15
28	70	3010	110	39	106	85	286	302	151	14	13	14
29	83	1110	108	38	---	77	288	265	135	11	13	14
30	281	692	104	36	---	69	236	222	119	8.9	10	14
31	286	---	94	36	---	64	---	198	---	8.2	10	---
TOTAL	6001.2	41076	13922	1687	33161	3443	29923	22135	22313	1646.9	1108.4	3294.0
MEAN	194	1369	449	54.4	1184	111	997	714	744	53.1	35.8	110
MAX	2870	12100	2190	88	8100	243	9620	4600	5790	258	351	817
MIN	5.2	35	94	36	36	48	59	163	119	6.7	3.5	8.8
CFSM	.62	4.35	1.43	.17	3.76	.35	3.17	2.27	2.36	.17	.11	.35
IN.	.71	4.85	1.64	.20	3.92	.41	3.53	2.61	2.64	.19	.13	.39
AC-FT	11900	81470	27610	3350	65770	6830	59350	43900	44260	3270	2200	6530
CAL YR 1985	TOTAL	157318.38	MEAN	431	MAX	12100	MIN	.79	CFSM	1.37	IN.	18.58
WTR YR 1986	TOTAL	179710.5	MEAN	492	MAX	12100	MIN	3.5	CFSM	1.56	IN.	21.22
											AC-FT	312000
											AC-FT	356500

## 07338500 LITTLE RIVER BELOW LUKFATA CREEK NEAR IDABEL, OK

LOCATION.--Lat 33°56'28", long 94°45'30", in SE 1/4 SE 1/4 sec.14, T.7 S., R.24 E., McCurtain County, Hydrologic Unit 11140107, on left bank at downstream side of bridge on U.S. Highway 70 just downstream from Lukfata Creek, 5.0 mi northeast of Idabel, and at mile 103.4.

DRAINAGE AREA.--1,226 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1946 to current year.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 312.08 ft, National Geodetic Vertical Datum of 1929. Oct. 1, 1946 to Oct. 26, 1950, and for stages below 9.0 ft Oct. 26, 1950 to Oct. 10, 1951, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since June 1969 by Pine Creek Lake (station 07337300), 41.9 mi upstream.

COOPERATION.--Gage-height record and 7 discharge measurements furnished by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--Prior to regulation by Pine Creek Lake, 22 years (water years 1947-68), 1,622 ft<sup>3</sup>/s, 1,174,000 acre-ft/yr; since regulation by Pine Creek Lake, 16 years (water years 1971-86), 1,757 ft<sup>3</sup>/s, 1,273,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 103,000 ft<sup>3</sup>/s, Dec. 10, 1971, gage height, 39.39 ft; minimum discharge, 0.4 ft<sup>3</sup>/s, Sept. 15-16, and Sept. 21 to Oct. 1, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in February 1938 reached a stage of 39.7 ft, from information by local resident, discharge, 86,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,300 ft<sup>3</sup>/s, Apr. 21, gage height, 25.80 ft; minimum daily discharge, 28 ft<sup>3</sup>/s, Oct. 12, 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	1270	9130	411	109	396	220	3930	3750	174	96	55
2	52	1010	9060	394	110	300	187	3160	3410	1030	95	51
3	40	621	8880	385	809	265	180	2020	3520	2130	94	57
4	34	532	8370	340	8710	254	4240	1450	3900	942	94	107
5	32	475	7800	219	10400	247	6600	1340	4160	639	93	458
6	30	563	7330	179	9270	239	4870	1290	3730	513	99	2540
7	29	887	6960	169	9250	226	2050	1260	3590	448	119	1400
8	29	680	6690	161	8380	220	2380	902	3970	403	118	1300
9	29	279	6470	154	6970	213	2980	482	4110	375	104	1950
10	29	147	5940	147	5760	221	2850	709	3590	356	104	2380
11	29	107	7280	144	5840	267	2730	1500	3310	344	155	2360
12	28	94	7210	145	6720	307	2640	1420	3360	289	214	2320
13	28	83	4240	141	6910	425	2530	1620	3240	142	147	2280
14	29	78	3310	137	6880	377	2180	2250	2400	87	114	2240
15	33	96	3110	135	6750	366	1880	2960	1840	66	102	2200
16	42	4410	2890	133	6630	655	1690	4060	1920	58	108	1560
17	46	5370	2730	137	6500	949	1590	4210	5960	54	120	1260
18	53	6560	2220	154	6300	779	1540	7760	5060	52	335	856
19	1330	7140	1510	164	5830	667	2570	8280	3450	47	379	584
20	2420	6780	935	154	4480	651	9760	6490	3720	60	679	516
21	1140	6700	701	148	2480	674	11000	4840	3440	95	681	350
22	1040	7000	656	143	889	600	8840	4920	2750	102	661	309
23	1570	7040	623	138	583	552	5460	5390	2610	98	470	289
24	1330	6900	593	133	544	518	5440	5500	2550	98	157	284
25	1020	6720	683	129	509	484	6430	6560	1890	100	77	282
26	962	6690	765	128	485	457	6640	4710	1650	99	57	278
27	936	8400	751	130	473	435	6610	2520	1480	98	52	270
28	924	9610	658	120	440	418	6590	3040	841	97	53	272
29	945	9440	465	117	---	384	6450	4370	314	100	107	289
30	1000	9460	431	114	---	286	5380	4920	218	98	93	259
31	1290	---	423	111	---	236	---	4170	---	96	65	---
TOTAL	16548	115142	118814	5414	129011	13068	124507	108033	89733	9290	5842	29356
MEAN	534	3838	3833	175	4608	422	4150	3485	2991	300	188	979
MAX	2420	9610	9130	411	10400	949	11000	8280	5960	2130	681	2540
MIN	28	78	423	111	109	213	180	482	218	47	52	51
AC-FT	32820	228400	235700	10740	255900	25920	247000	214300	178000	18430	11590	58230

CAL YR 1985 TOTAL 756521 MEAN 2073 MAX 10200 MIN 16 AC-FT 1501000  
WTR YR 1986 TOTAL 764758 MEAN 2095 MAX 11000 MIN 28 AC-FT 1517000

## RED RIVER BASIN

309

## 07338900 BROKEN BOW LAKE NEAR BROKEN BOW, OK

LOCATION.--Lat 34°08'35", long 94°41'00", in SW 1/4 sec.3, T.5 S., R.25 E., McCurtain County, Hydrologic Unit 11140108, at intake structure on upstream side of dam on Mountain Fork, 9.0 mi northeast of Broken Bow, and at mile 20.3.

DRAINAGE AREA.--754 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1968 to current year. Prior to October 1970, published as Broken Bow Reservoir near Broken Bow.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by a rolled earth and gravel structure. Outlet works consists of power-generated turbines and a concrete ogee-type weir controlled by eight 40- by 40-foot taintor gates. Regulated storage began Oct. 3, 1968; conservation pool was first filled Jan. 30, 1969. Total capacity, 1,368,000 acre-ft at elevation 627.5 ft, top of flood pool and spillway gages, 918,100 acre-ft at elevation 599.5 ft, top of power pool, and 448,200 acre-ft at elevation 559.0 ft, bottom of power pool. Figures given herein represent total contents. Reservoir is used for flood control, power development and water supply.

COOPERATION.--Records furnished by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,244,400 acre-ft, Nov. 3, 4, 1984, elevation, 620.40 ft; minimum since conservation pool was first filled, 672,000 acre-ft, Oct. 21, 1972, elevation 580.48 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,034,900 acre-ft, Feb. 9, elevation 607.42 ft; minimum 840,200 acre-ft, Oct. 17, elevation, 593.86 ft.

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

590	789,300	607	1,028,500
594	842,100	615	1,154,600
598	897,000	621	1,254,600

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	848400	849400	1019200	916700	909700	911100	906800	919400	914800	914100	883300	867600
2	847100	850000	1019200	916800	910000	911600	901400	917500	914100	915400	882800	867500
3	846900	850500	1014500	917100	943700	909700	904100	918500	922500	915300	883000	868200
4	845700	850300	1006200	917900	986500	908000	911000	919500	927300	915300	880700	869100
5	845500	850300	994700	917500	998300	906800	926600	913400	930800	915300	880300	871000
6	844900	850000	982800	916700	1021500	905200	934600	912800	936200	915400	878900	872400
7	843400	849500	970500	917000	1030700	902700	936900	912600	942300	913800	878800	873200
8	843300	848800	957900	915500	1033400	902300	934900	911900	945900	912800	877400	872800
9	842900	849000	945000	916000	1033400	902700	930800	910300	943300	912700	877200	872600
10	842500	849600	940100	915500	1028500	903100	927300	912800	936900	912400	877700	871600
11	841700	849100	952100	915400	1017900	901300	924000	915100	933800	911000	876600	872800
12	841500	849800	957900	916100	1006700	901900	929000	915400	928600	910600	876100	871900
13	841500	848800	955300	915100	994800	903000	931600	913800	921900	910400	874600	871900
14	841000	849400	949800	915000	983400	903600	926800	912800	920500	909600	874300	871700
15	841100	856700	943400	914100	971600	904400	922500	918100	918200	906200	873500	870400
16	840200	864200	936600	915300	960000	905800	918100	913700	917800	905700	879200	870400
17	840600	877000	929900	915000	947300	906200	913800	929200	919800	905500	879600	870100
18	843000	887200	923800	915000	934600	907600	913800	945400	921100	904300	878300	870400
19	846500	896100	919900	915100	928300	907800	949900	948600	920500	904300	878100	869400
20	847900	901000	916400	914700	921800	907300	989500	947600	918400	904000	877100	869400
21	847900	903100	917400	914700	916000	904700	999800	944000	917900	900900	876700	869400
22	848000	905000	918800	913400	916000	907100	1001100	939500	918200	900300	875200	868800
23	847500	906900	918700	910700	916100	907800	994700	933500	916800	900200	874900	868700
24	847500	908800	918700	910900	915800	907100	986700	928600	915800	899500	874800	867500
25	847100	909700	917400	911300	914800	906400	973500	929200	914700	897800	873700	866200
26	846700	925000	918100	911300	914800	906200	960100	928900	914700	897500	873200	865200
27	846800	996900	917800	909700	913300	906800	947000	926200	913700	897100	872300	865000
28	847500	1013200	917800	910300	910700	906800	935200	924600	913700	895300	871900	866100
29	848400	1015100	918200	909900	---	906900	928900	917700	914300	890800	870200	864500
30	849500	1015900	917200	909500	---	907300	923300	913300	914100	886800	869500	864300
31	849100	---	917700	908300	---	906900	---	914100	---	883700	868800	---
MAX	849500	1015900	1019200	917900	1033400	911600	1001100	948600	945900	915400	883300	873200
MIN	840200	848800	916400	908300	909700	901300	901400	910300	913700	883700	868800	864300
(+)	594.52	606.17	599.47	598.81	598.90	598.71	599.87	599.22	599.22	597.05	595.97	595.64
(++)	+400	+166,800	-98,200	-9,400	+2,400	-3,800	+16,400	-9,200	0	-30,400	-14,900	-4,500
CAL YR 1985	MAX	1019200	MIN	840200	(++)	-15,600						
WTR YR 1986	MAX	1033400	MIN	840200	(++)	+15,600						

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

LOCATION.--Lat 34°02'30", long 94°37'15", in SE 1/4 SE 1/4 sec.7, T.6 S., R.26 E., McCurtain County, Hydrologic Unit 1140108, near center of span on downstream side of pier of bridge on U.S. Highway 70, 2.0 mi west of Eagletown, 10.7 mi downstream from Broken Bow Dam, and at mile 8.9.

PERIOD OF RECORD.--March 1924 to December 1925, October 1929 to current year. Published as Mountain Fork River near Broken Bow 1924-25 and as Mountain Fork River near Eagletown 1929-60. Monthly discharge only for some periods, published in WSP 1311.

GAGE.--Water-stage recorder. Datum of gage is 333.87 ft, National Geodetic Vertical Datum of 1929. See WSP 1920 for history of changes prior to July 23, 1950.

COOPERATION.--Gage-height record and 1 discharge measurements furnished by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 101,000 ft<sup>3</sup>/s, May 20, 1960, gage height, 26.73 ft; from rating curve extended above 65,000 ft<sup>3</sup>/s; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 18-19, 1915, reached a stage of 26.4 ft, from information by local resident, discharge, 92,500 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,060 ft<sup>3</sup>/s, Dec. 9, gage height, 7.58 ft; minimum daily discharge, 124 ft<sup>3</sup>/s, Jan. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	304	182	3400	161	219	558	214	2790	281	307	719	233
2	200	447	3320	338	140	160	1430	2190	1060	320	215	249
3	351	175	4600	157	477	520	1640	1570	1780	551	196	322
4	260	231	6290	141	1330	787	869	239	1900	453	329	438
5	377	203	7440	129	830	708	1630	1790	3170	229	458	344
6	173	189	7200	124	2190	1060	426	1850	3950	214	248	444
7	209	362	7260	170	2790	1130	518	609	3780	197	352	215
8	287	176	7320	149	2550	664	2250	604	3770	296	283	205
9	189	332	7350	341	2700	166	3180	959	4290	367	396	257
10	263	171	5230	155	4230	149	2750	580	5500	219	210	261
11	210	160	2410	307	7000	467	3060	292	5090	229	291	379
12	301	208	884	144	7030	1100	1720	289	5070	330	306	240
13	172	180	3710	133	7040	193	1420	1050	5360	216	294	332
14	181	263	4710	240	7070	164	3830	920	2600	207	375	209
15	224	318	4840	320	7090	298	3760	1020	2240	821	284	229
16	179	496	4890	202	7110	173	2970	3490	2300	980	367	334
17	294	212	4520	138	7140	169	3260	2440	1620	231	214	230
18	236	683	4050	322	7150	439	1390	1460	543	260	274	364
19	421	736	2670	141	5320	180	1880	2580	396	363	362	380
20	176	216	2420	253	3070	741	1540	3080	789	215	272	508
21	181	203	1080	217	3240	603	350	3680	710	444	346	215
22	274	346	203	422	1300	257	1400	3280	243	757	300	210
23	192	438	171	1570	627	161	4540	3940	336	451	343	271
24	410	172	334	385	178	175	5390	4090	671	228	211	259
25	188	170	432	144	730	553	7750	2000	651	490	213	633
26	346	409	171	130	612	607	7650	1230	496	553	262	720
27	217	1540	172	243	829	173	7860	1540	426	217	310	466
28	186	598	283	176	1010	236	7790	2420	621	300	379	212
29	292	1830	162	289	---	218	3990	3030	235	1240	263	213
30	195	3460	150	195	---	162	3630	2420	233	2000	337	289
31	312	---	165	138	---	155	---	1390	---	2250	207	---
TOTAL	7800	15106	97837	7974	91002	13126	90087	58822	60111	15935	9616	9661
MEAN	252	504	3156	257	3250	423	3003	1897	2004	514	310	322
MAX	421	3460	7440	1570	7150	1130	7860	4090	5500	2250	719	720
MIN	172	160	150	124	140	149	214	239	233	197	196	205
AC-FT	15470	29960	194100	15820	180500	26040	178700	116700	119200	31610	19070	19160

CAL	YR	1985	TOTAL	512805	MEAN	1405	MAX	8030	MIN	126	AC-FT	1017000
WTR	YR	1986	TOTAL	477077	MEAN	1307	MAX	7860	MIN	124	AC-FT	946300

As the number of streams on which stream flow 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 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. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected. 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 to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

## Crest-stage partial-record stations

The following table contains annual maximum discharges for crest-stage stations. A crest-station gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain, but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained, but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1986

Station number	Station name	Location	Drainage area (mi <sup>2</sup> )	Period of record	Annual maximum		
					Date	Gage height (ft)	Dis-charge (ft <sup>3</sup> /s)
ARKANSAS RIVER BASIN							
07159200	Kingfisher Creek near Kingfisher, Okla.	Lat 35°50'30", long 98°03'57", in NW 1/4 SW 1/4 sec.28, T.16 N., R.8 W., Kingfisher County, at county road bridge, 7.6 mi west of Kingfisher.	157	1967-70† 1971-86	11-01-84 10-03-85	12.38	347
07237800	Bent Creek near Seiling, Okla.	Lat 36°11'26", long 99°00'36", in SE 1/4 SE 1/4, sec.21, T.20 N., R.17 W., Woodward County, at bridge on U.S. Highway 183 and 270, 6 mi northwest of Seiling.	139	1964-70† 1971-86	10-25-84	<12.90	<1,210

† Operated as a continuous-record station.

## Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of a stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1986

Station number	Station name	Location	Drainage area (mi <sup>2</sup> )	Period of record	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
ARKANSAS RIVER BASIN						
07148360	Greenwood Creek near Winchester, Okla.	Lat 36°55'23", long 98°47'27", in SW 1/4 NW 1/4 sec.11, T.28 N., R.14 N., Woods County, at county road bridge 2.4 mi south of Winchester and at mile 1.9.	41.2	1972-86	11-21-85 03-13-86 04-24-86 08-08-86	4.4 3.6 1.7 .84
RED RIVER BASIN						
07329847	Buffalo Spring near Sulphur, Okla.	Lat 34°30'08", long 96°56'21", in SW 1/4 NE 1/2 sec.1, T.1 S., R.3 E., Murray County, 0.1 mi upstream from Travertine Creek and 2 mi east of Sulphur.		1986	11-18-85 03-06-86 04-17-86 06-03-86 07-09-86 08-21-86	0.52 .71 .28 .46 .45 .24





# INDEX

313

Page	Page
Accuracy of the records.....	7
Acre-foot, definition of.....	10
Alex, Washita River at.....	270
Winter Creek near.....	269
Algae, definition of.....	10
Altus, Lake, at Lugert.....	213
Alva, Salt Fork Arkansas River near.....	26
Anadarko, Washita River at.....	267
Antelope Spring at Sulphur.....	274
Antlers, Kiamichi River near.....	299
Arcadia, Deep Fork near.....	189-190
Arkansas River at Ralston.....	34-38
at Robert S. Kerr Lock and Dam near Salisaw... 203-204	
at Tulsa.....	62-64
near Haskell.....	66
near Ponca City.....	24
Salt Fork, at Tonkawa.....	32
near Alva.....	26
near Jet.....	28-31
near Winchester.....	25
Arrangement of records.....	8
Arthur City, TX, Red River at.....	293
Artificial substrate, definition of.....	15
Ash mass, definition of.....	10
Avant, Bird Creek at.....	82
Bacteria, definition of.....	10
Barnsdall, Birch Creek below Birch Lake near.....	81
Birch Lake near.....	80
Baron Fork at Eldon.....	111
Bartlesville, Caney River above Coon Creek near.....	73
Beaver, Beaver River at.....	149-151
Beaver Creek near Waurika.....	235
Beaver River, at Beaver.....	149-151
near Guymon.....	145
near Hardesty.....	148
Beggs, Deep Fork near.....	193-196
Bed load, definition of.....	14
Bed load discharge, definition of.....	14
Bed material, definition of.....	10
Bent Creek near Selling.....	311
Big Cabin, Big Cabin Creek near.....	97
Big Cabin Creek near Big Cabin.....	97
Big Cedar, Kiamichi River near.....	294-296
Biochemical oxygen demand, definition of.....	10
Biomass, definition of.....	10
Birch Creek below Birch Lake near Barnsdall.....	81
Birch Lake near Barnsdall.....	80
Bird Creek at Avant.....	82
near Catoosa.....	87-88
near Sperry.....	86
Black Bear Creek at Pawnee.....	39
Blackwell, Chikaskia River near.....	33
Blue, Blue River near.....	288
Blue Beaver Creek near Cache.....	230-232
Blue River at Milburn.....	287
near Blue.....	288
Blue-green algae, definition of.....	13
Bottom material, definition of.....	10
Bowlegs, Little River near.....	136-138
Bridgeport, Canadian River at.....	116-121
Broken Bow, Broken Bow Lake near.....	309
Broken Bow Lake near Broken Bow.....	309
Brooken, Eufaula Lake near.....	197
Buffalo, Cimarron River near.....	45-47
Buffalo Creek near Lovedale.....	48
Buffalo Spring at Sulphur.....	311
Burkburnett, TX, Red River near.....	225-227
Byrds' Mill Spring near Fittstown.....	290
Cache, Blue Beaver Creek near.....	230-232
Calvin, Canadian River at.....	142-144
Canadian River, at Bridgeport.....	116-121
at Calvin.....	142-144
at Purcell.....	122
near Whitefield.....	198-202
Caney, Clear Boggy Creek near.....	291
Caney River, above Coon Creek near Bartlesville.....	73
near Hulah.....	71
near Ramona.....	75-78
Canton, Canton Lake near.....	159-165
North Canadian River at.....	166
Canton Lake near Canton.....	159-165
Carnegie, Washita River at.....	260-263
Carter, North Fork Red River near.....	212
Catoosa, Bird Creek near.....	87-88
Cells/volume, definition of.....	10
Chemical Quality of Streamflow.....	2
Chemical oxygen demand, definition of.....	10
Cheyenne, Washita River near.....	245
Chikaskia River near Blackwell.....	33
Chlorophyll, definition of.....	10
Chouteau, Neosho River near.....	102-103
Cimarron River, at Perkins.....	56-59
near Buffalo.....	45-47
near Dover.....	50
near Englewood.....	42-44
near Forgan.....	41
near Guthrie.....	54
near Kenton.....	40
near Waynoka.....	49
Claremore, Verdigris River near.....	79
Classification of records.....	8
Clayton, Kiamichi River at.....	298
Sardis Lake near.....	297
Clear Boggy Creek near Caney.....	291
Clear Creek near Elmwood.....	152
Clinton, Washita River near.....	259
Cobb Creek near Eakly.....	264
near Fort Cobb.....	266
Coldwater Creek near Guymon.....	146
Color unit, definition of.....	11
Commerce, Neosho River near.....	91
Contents, definition of.....	11
Control, definition of.....	11
Control structure, definition of.....	11
Cooperation.....	1
Copan Lake near Copan.....	72
Copan, Copan Lake near.....	72
Cottonwood Creek near Navina.....	51-53
Council Creek near Stillwater.....	60
Courtney, Mud Creek near.....	240
Crest-stage partial-record stations.....	311
Cubic foot per second, definition of.....	11
Cubic foot per second per square mile, definition of.....	11
Data collection and computation.....	5
Data presentation.....	6,9
De Kalb, TX, Red River near.....	301-304
Deep Red Run near Randlett.....	233
Deep Fork near Arcadia.....	189-190
near Beggs.....	193-196
near Warwick.....	191
Definition of terms.....	10
Denison, TX, Lake Texoma near.....	282
Red River at Denison Dam, near.....	283-286
Diatoms, definition of.....	13
Dickson, Washita River near.....	276-281
Discharge at partial-record stations.....	311
Discharge, definition of.....	11
Dissolved, definition of.....	11
Dissolved-solids concentration, definition of... 11	
Dover, Cimarron River near.....	50
Downstream order system.....	4
Drainage area, definition of.....	11
Drainage basin, definition of.....	11
Dry Creek near Kendrick.....	192
Dry mass, definition of.....	10
Eagletown, Mountain Fork near.....	310
Eakly, Cobb Creek near.....	264
East Cache Creek near Walters.....	228-229
El Reno, North Canadian River near.....	168
Eldon, Baron Fork at.....	111
Elk Creek near Hobart.....	215-218
Elk River near Tiff City, MO.....	94
Elmer, Salt Fork Red River near.....	208-210
Elmwood, Clear Creek near.....	152
Englewood, Cimarron River near.....	42-44
Eufaula Lake near Brooken.....	197
Explanation of records.....	4
Farris, Muddy Boggy Creek near.....	289
Fecal coliform bacteria, definition of.....	10
Fecal streptococcal bacteria, definition of.....	10

	Page		Page
Fittstown, Byrds' Mill Spring near.....	290	Fort Supply Lake near Fort Supply.....	153
Flint Creek near Kansas.....	109	Foss Reservoir near Foss.....	250-254
Forgan, Cimarron River near.....	41	Great Salt Plains Lake near Jet.....	27
Fort Cobb, Cobb Creek near.....	266	Heyburn Lake near Heyburn.....	65
Fort Cobb Reservoir near.....	265	Hudson, Lake, near Locust Grove.....	101
Fort Cobb Reservoir near Fort Cobb.....	265	Hugo Lake near Hugo.....	300
Fort Gibson, Fort Gibson Lake near.....	104	Hulah Lake near Hulah.....	70
Neosho River below Fort Gibson Lake, near.....	105-107	Kaw Lake near Ponca City.....	23
Fort Gibson Lake near Fort Gibson.....	104	Keystone Lake near Sand Springs.....	61
Fort Supply, Fort Supply Lake near.....	153	O' The Cherokees, Lake, at Langley.....	95
Wolf Creek near.....	154	Oologah Lake near Oologah.....	68
Fort Supply Lake near Fort Supply.....	153	Optima Lake near Hardesty.....	147
Foss, Foss Reservoir near.....	250-254	Overholser, Lake, near Oklahoma City.....	170
Washita River near.....	255-258	Pine Creek Lake near Wright City.....	305
Foss Reservoir near Foss.....	250-254	Sardis Lake near Clayton.....	297
Fourche Maline near Red Oak.....	205	Skiatook Lake near Skiatook.....	83
		Tenkiller Ferry Lake near Gore.....	112
Gage height, definition of.....	11	Texoma, Lake, near Denison, TX.....	282
Gaging station, definition of.....	11	Thunderbird, Lake, near Norman.....	124-133
Gainesville, TX, Red River near.....	241-244	Waurika Lake near Waurika.....	234
Glover Creek near Glover.....	307	Wister Lake near Wister.....	206
Glover, Glover Creek near.....	307	Langley, Lake O' The Cherokees near.....	95
Gore, Illinois River near.....	113-115	Neosho River near.....	96
Tenkiller Ferry Lake near.....	112	Latitude-longitude system.....	4
Great Salt Plains Lake near Jet.....	27	Lenapah, Verdigris River near.....	67
Green algae, definition of.....	13	Little River below Lake Thunderbird near Norman.....	134
Greenwood Creek near Winchester.....	311	near Bowlegs.....	136-138
Guthrie, Cimarron River near.....	54	near Sasakwa.....	139-141
Guymon, Beaver River near.....	145	near Tecumseh.....	135
Coldwater Creek near.....	146	Little River below Lukfata Creek near Idabel.....	308
		near Wright City.....	306
Hammon, Washita River near.....	246-249	Little Washita River near Ninnekah.....	268
Hardesty, Beaver River near.....	148	Locust Grove, Lake Hudson near.....	101
Optima Lake near.....	147	Lovedale, Buffalo Creek near.....	48
Hardesty, definition of.....	11	Lovell, Skeleton Creek near.....	55
Harrah, North Canadian River near.....	172-183	Low-flow partial-record stations.....	311
Haskell, Arkansas River near.....	66	Lugert, Lake Altus at.....	213
Headrick, North Fork Red River near.....	219-222	North Fork Red River below Altus Dam, near....	214
Heyburn, Heyburn Lake near.....	65		
Heyburn Lake near Heyburn.....	65	Mangum, Salt Fork Red River at.....	207
Hobart, Elk Creek near.....	215-218	Mean concentration, definition of.....	14
Hoover, Wildhorse Creek near.....	273	Mean discharge, definition of.....	11
Hudson, Lake near Locust Grove.....	101	Miami, Tar Creek at 22nd Street Bridge near....	92
Hugo, Hugo Lake near.....	300	Micrograms per grams, definition of.....	12
Hugo Lake near Hugo.....	300	per liter, definition of.....	12
Hulah, Caney River near.....	71	Milburn, Blue River at.....	287
Hulah, Lake near.....	70	Milligrams of carbon per area or volume per unit	
Hulah Lake near Hulah.....	70	time, definition of.....	13
Hydrologic Bench-Mark Network, definition of....	3,12	Milligrams of oxygen per area or volume per unit	
Hydrologic unit, definition of.....	12	time, definition of.....	14
		Milligrams per liter, definition of.....	12
Idabel, Little River below Lukfata Creek, near..	308	Mountain Fork, near Eagletown.....	310
Illinois River, near Gore.....	113-115	Mountain Park, West Otter Creek at Snyder Lake	
near Tahlequah.....	110	near.....	223
near Watts.....	108	Mud Creek near Courtney.....	240
Inola, Verdigris River near.....	89-90	Muddy Boggy Creek near Farris.....	289
Instantaneous discharge, definition of.....	11	near Unger.....	292
Introduction.....	1		
		National Geodetic Vertical Datum of 1929,	
Jet, Great Salt Plains Lake near.....	27	definition of.....	12
Salt Fork Arkansas River near.....	28-31	National Stream-Quality Accounting Network,	
		definition of.....	3,12
Kansas, Flint Creek near.....	109	National Trends Network, definition of.....	4,12
Kaw Lake near Ponca City.....	23	Natural substrate, definition of.....	15
Kendrick, Dry Creek near.....	192	Navina, Cottonwood Creek near.....	51-53
Kenton, Cimarron River near.....	40	Neosho River below Fort Gibson Lake near	
Keystone Lake near Sand Springs.....	61	Fort Gibson.....	105-107
Kiamichi River, at Clayton.....	298	near Chouteau.....	102-103
near Antlers.....	299	near Commerce.....	91
near Big Cedar.....	294-296	near Langley.....	96
Kingfisher Creek near Kingfisher.....	311	Ninnekah, Little Washita River near.....	268
		Norman, Lake Thunderbird near.....	124-133
Laboratory measurements.....	9	Little River below Lake Thunderbird near.....	134
Lake Hefner Canal near Oklahoma City.....	169	North Canadian River at Canton.....	166
Lakes and reservoirs:		at Woodward.....	155-157
Altus, Lake, at Lugert.....	213	below Lake Overholser near Oklahoma City.....	171
Birch Lake near Barnsdall.....	80	below Weavers Creek near Watonga.....	167
Broken Bow Lake near Broken Bow.....	309	near El Reno.....	168
Canton Lake near Canton.....	159-165	near Harrah.....	172-183
Copan Lake near Copan.....	72	near Seiling.....	158
Eufaula Lake near Broken.....	197	near Wetumka.....	184-188
Fort Cobb Reservoir near Fort Cobb.....	265		
Fort Gibson Lake near Fort Gibson.....	104		

	Page		Page
North Fork Red River, below Altus Dam, near		Salt Fork Red River near Mangum.....	207
Lugert.....	214	near Elmer.....	208-210
near Carter.....	212	Sand Creek at Okesa.....	74
near Headrick.....	219-222	Sand Springs, Keystone Lake near.....	61
near Tipton.....	224	Sardis Lake near Clayton.....	297
0' The Cherokees, Lake, near Langley.....	95	Sasakwa, Little River near.....	139-141
Okesa, Sand Creek at.....	74	Sediment.....	8
Oklahoma City, Lake Hefner Canal near.....	169	Sediment, definition of.....	14
Lake Overholser near.....	170	Selling, North Canadian River near.....	158
North Canadian River below Lake Overholser		Skeleton Creek near Lovell.....	55
near.....	171	Skiatook, Hominy Creek near.....	85-85
On-site measurements and sample collection.....	8	Skiatook Lake near.....	83
Oologah, Oologah Lake near.....	68	Skiatook Lake near Skiatook.....	83
Oologah, Verdigris River near.....	69	Sodium-adsorption-ratio, definition of.....	14
Oologah Lake near Oologah.....	68	Solute, definition of.....	14
Optima Lake near Hardesty.....	147	Spavinaw Creek near Sycamore.....	98-100
Organic mass, definition of.....	10	Special Networks and Programs.....	4
Organism, definition of.....	12	Specific conductance, definition of.....	14
Count/area, definition of.....	12	Sperry, Bird Creek near.....	86
Count/volume, definition of.....	12	Spring River near Quapaw.....	93
Other records available.....	7	Stage discharge relation, definition of.....	15
Overholser, Lake, near Oklahoma City.....	170	Station identification numbers.....	3
Parameter Code, definition of.....	12	Station records.....	23
Partial-record stations.....	311	Stillwater, Council Creek near.....	60
Partial-record stations, definition of.....	12	Streamflow.....	2
Particle size, definition of.....	12	Streamflow, definition of.....	15
Particle-size classification, definition of.....	13	Substrate, definition of.....	15
Pauls Valley, Washita River near.....	271	Sulphur, Antelope Spring at.....	274
Pawnee, Black Bear Creek at.....	39	Vendome Well at.....	275
Percent composition, definition of.....	13	Summary of Hydrologic Conditions.....	2
Periphyton, definition of.....	13	Surface area, definition of.....	15
Perkins, Cimarron River at.....	56-59	Surficial bed material, definition of.....	15
Pesticides, definition of.....	13	Suspended, definition of.....	15
Phytoplankton, definition of.....	13	Suspended, recoverable, definition of.....	15
Picocurie, definition of.....	13	Suspended sediment, definition of.....	14
Pine Creek Lake near Wright City.....	305	Suspended, total, definition of.....	15
Plankton, definition of.....	13	Suspended-sediment concentration,	
Ponca City, Arkansas River near.....	24	definition of.....	14
Kaw Lake near.....	23	discharge, definition of.....	14
Primary productivity, definition of.....	13	load, definition of.....	14
Publications on techniques of water resources		Sweetwater, Sweetwater Creek near.....	211
investigations.....	17-18	Sweetwater Creek near Sweetwater.....	211
Purcell, Canadian River at.....	122	Sycamore, Spavinaw Creek near.....	98-100
Walnut Creek at.....	123	Tahlequah, Illinois River near.....	110
Purdy, Rush Creek at.....	272	Tar Creek at 22nd Street Bridge at Miami.....	92
Quapaw, Spring River near.....	93	Taxonomy, definition of.....	15
Ralston, Arkansas River at.....	34-38	Tecumseh, Little River near.....	135
Ramona, Caney River near.....	75-78	Tenkiller Ferry Lake near Gore.....	112
Randlett, Deep Red Run near.....	233	Terms, definition of.....	10
Records of stage and water discharge.....	5	Terral, Red River near.....	236-239
Records of surface-water quality.....	7	Texoma, Lake, near Denison, TX.....	282
Recoverable from bottom material,		Thunderbird, Lake, near Norman.....	124-133
definition of.....	14	Tiff City, MO, Elk River near.....	94
Red Oak, Fourche Maline near.....	205	Time-weighted average definition of.....	15
Red River at Arthur City, TX.....	293	Tipton, North Fork Red River near.....	224
at Denison Dam near Denison, TX.....	283-286	Tonkawa, Salt Fork Arkansas River at.....	32
near Burkburnett, TX.....	225-227	Tons per acre-foot, definition of.....	16
near De Kalb, TX.....	301-304	Tons per day, definition of.....	16
near Gainesville, TX.....	241-244	Total, definition of.....	16
near Terral.....	236-239	Total coliform bacteria, definition of.....	10
North Fork, below Altus Dam, near Lugert.....	214	Total discharge, definition of.....	16
near Carter.....	212	Total organism count, definition of.....	12
near Headrick.....	219-222	Total recoverable, definition of.....	16
near Tipton.....	224	Total sediment discharge,	
Salt Fork, at Mangum.....	207	definition of.....	14
near Elmer.....	208-210	Total-sediment load, definition.....	14
Remark codes.....	9	Tulsa, Arkansas River at.....	62-64
Reservoirs: See Lakes and reservoirs.		Unger, Muddy Boggy Creek near.....	292
Return period, definition of.....	14	Vendome Well at Sulphur.....	275
Robert S. Kerr Lock and Dam near Sallisaw.....	203-204	Verdigris River, near Claremore.....	79
Runoff in inches, definition of.....	14	near Inola.....	89-90
Rush Creek at Purdy.....	272	near Lenapah.....	67
		near Oologah.....	69
Sallisaw, Robert S. Kerr Lock and Dam near.....	203-204	Walnut Creek at Purcell.....	123
Salt Fork Arkansas River at Tonkawa.....	32	Walters, East Cache Creek near.....	228-229
near Alva.....	26	Warwick, Deep Fork near.....	191
near Jet.....	28-31	Washita River, at Alex.....	270
near Winchester.....	25	at Anadarko.....	267
		at Carnegie.....	260-263

	Page		Page
Washita River, at Cheyenne.....	245	West Otter Creek at Snyder Lake near	
near Clinton.....	259	Mountain Park.....	223
near Dickson.....	276-281	Wet mass, definition of.....	10
near Foss.....	255-258	Wetumka, North Canadian near.....	184-188
near Hammon.....	246-249	Whitefield, Canadian River near.....	198-202
near Pauls Valley.....	271	Wildhorse Creek near Hoover.....	273
Water temperature.....	8	Winchester, Salt Fork Arkansas River near.....	25
Water year, definition of.....	16	Winter Creek near Alex.....	269
Watonga, North Canadian River below Weavers		Wister, Wister Lake near.....	206
Creek near.....	167	Wister Lake near Wister.....	206
Watts, Illinois River near.....	108	Wolf Creek near Fort Supply.....	154
Waurika, Beaver Creek near.....	235	Woodward, North Canadian River at.....	155-157
Waurika Lake near.....	234	Wright City, Little River near.....	306
Waurika Lake near Waurika.....	234	Wright City, Pine Creek Lake near.....	305
Waynoka, Cimarron River near.....	49	WSP, definition of.....	16
WDR, definition of.....	16		
Weighted average, definition of.....	16	Zooplankton, definition of.....	13



## CALENDAR FOR WATER YEAR 1986

1985

## OCTOBER

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

## NOVEMBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

## DECEMBER

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

1986

## JANUARY

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

## FEBRUARY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	

## MARCH

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

## APRIL

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

## MAY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

## JUNE

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

## JULY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

## AUGUST

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

## SEPTMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				



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