

ANNUAL YIELD AND SELECTED HYDROLOGIC DATA FOR

THE ARKANSAS RIVER BASIN COMPACT

ARKANSAS--OKLAHOMA

1986 WATER YEAR

By M.A. Moore, T.E. Lamb, and S.P. Blumer



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CONVERSION FACTORS

For use of readers who prefer to use metric units, conversion factors for terms used in this report are listed below:

<u>Multiply</u>	<u>By</u>	<u>To obtain</u>
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
acre	4047	square meter (m ²)
	0.004047	square kilometer (km ²)
square mile (mi ²)	2.590	square kilometer (km ²)
cubic foot (ft ³)	0.02832	cubic meter (m ³)
acre-foot (acre-ft)	1233	cubic meter (m ³)
	1.233x10 ⁻⁶	cubic kilometer (km ³)
cubic foot per second (ft ³ /s)	28.32	liter per second (L/s)
	0.02832	cubic meter per second (m ³ /s)

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ABSTRACT

The computed annual yield and deficiency of the subbasins as defined in the Arkansas River Compact, Arkansas-Oklahoma, are given in tables. Actual runoff from the subbasins and depletion caused by major reservoirs in the compact area are also given in tabular form. Monthly, maximum, minimum, and mean discharges are shown for the 14 streamflow stations used in computing annual yield. Water-quality data are shown for the Arkansas River at Dam No. 13, near Van Buren, Arkansas; Spavinaw Creek near Sycamore, Oklahoma; Neosho River below Fort Gibson Lake near Fort Gibson, Oklahoma; and Canadian River near Whitefield, Oklahoma.

INTRODUCTION

The computed annual yields for subbasins in the Arkansas River basin as defined in the Arkansas River Basin Compact, Arkansas-Oklahoma, 1972, are presented in this report. The area included in the Compact is shown in figure 1. Water-quality data for the Arkansas River at Dam No. 13 near Van Buren, Arkansas; Spavinaw Creek near Sycamore, Oklahoma; Neosho River below Fort Gibson Lake near Fort Gibson, Oklahoma; and Canadian River near Whitefield, Oklahoma are also included in the report.

EXPLANATION


 Spavinaw Creek subbasin

 Illinois River subbasin

 Lee Creek subbasin


 Poteau River subbasin

 Arkansas River subbasin

 Compact area boundary

 Subbasin boundary

 1958 Gaging station and abbreviated station number

 1935 Gaging and quality of water station and abbreviated station number

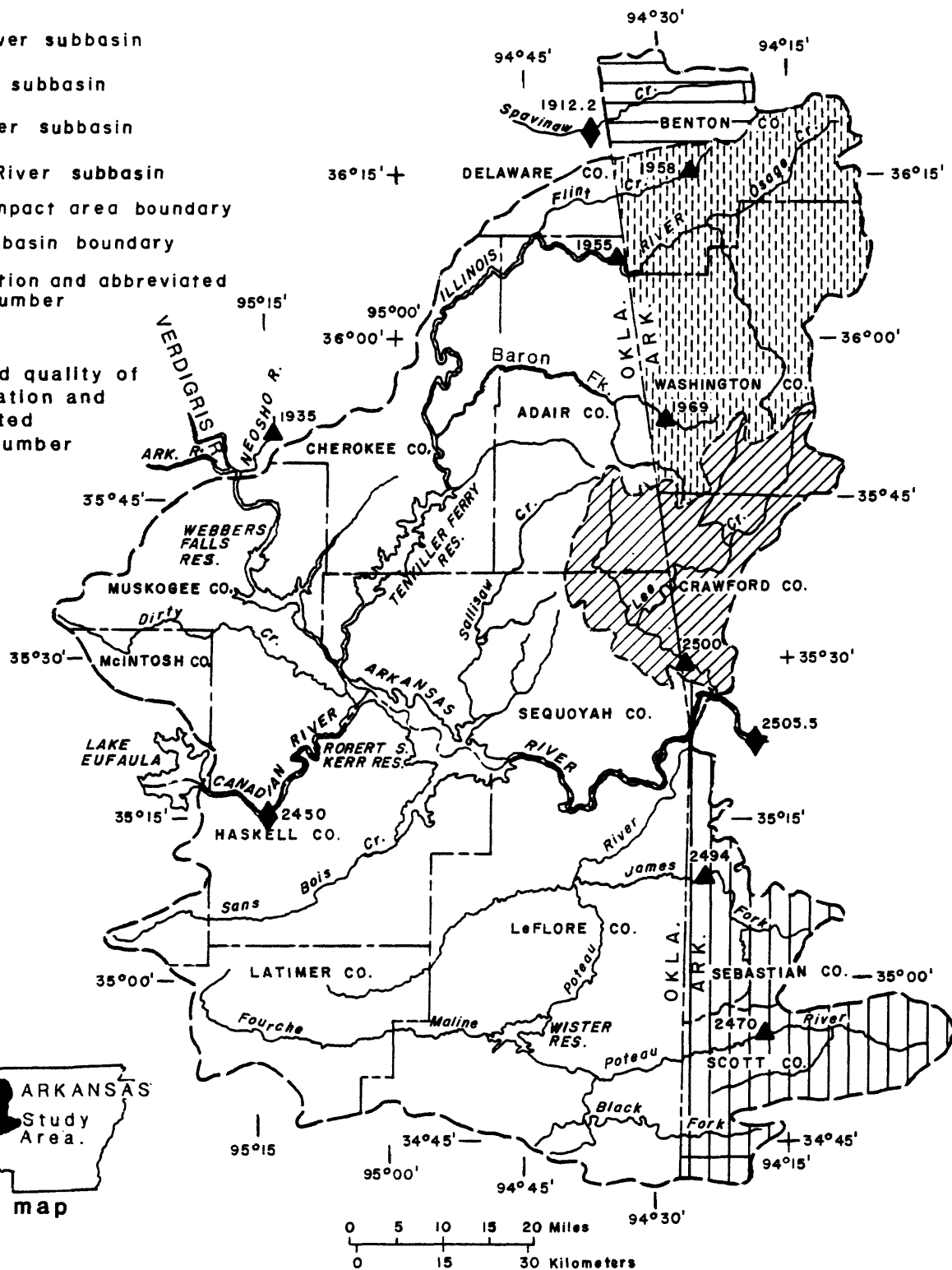


Figure 1.--Arkansas-Oklahoma Arkansas River Basin Compact area and subbasins.

This report was prepared by the U.S. Geological Survey in cooperation with the Arkansas-Oklahoma Arkansas River Compact Commission. Streamflow data were furnished by the Arkansas and Oklahoma Districts, U.S. Geological Survey and the U.S. Army Corps of Engineers, Tulsa District. The Tulsa District also provided data from the Webbers Falls, Tenkiller Ferry, Robert S. Kerr and Wister Reservoirs. Water-quality data were provided by the U.S. Geological Survey.

DEFINITION OF TERMS

The following terms used in this report are taken from Article II of the Arkansas River Basin Compact, Arkansas-Oklahoma, 1972.

The term "Arkansas River Basin" means all of the drainage basin of the the Arkansas River and its tributaries from a point immediately downstream from the confluence of the Neosho River with the Arkansas River (fig. 1) to a point immediately downstream from the confluence of Lee Creek with the Arkansas River, together with the drainage basin of Spavinaw Creek in Arkansas (top of fig. 1), but excludes that part of the drainage basin of the Canadian River upstream from Lake Eufaula Dam.

The term "Spavinaw Creek Subbasin" means the drainage area of Spavinaw Creek in the State of Arkansas.

The term "Illinois River Subbasin" means the drainage area of Illinois River in the State of Arkansas.

The term "Lee Creek Subbasin" means the drainage area of Lee Creek in the State of Arkansas and in the State of Oklahoma.

The term "Poteau River Subbasin" means the drainage area of Poteau River in the State of Arkansas.

The term "Arkansas River Subbasin" means all areas of the Arkansas River Basin except the four subbasins described previously.

The term "water year" means a 12-month period beginning on October 1 and ending September 30.

The term "annual yield" means the computed annual gross runoff from any specified subbasin. The runoff would have passed any certain point on a stream and would have originated within any specified area under natural conditions, without any manmade depletion or accretion during the water year.

Other hydrologic terms used in this report are defined as follows:

Acre-foot is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet.

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

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

Fecal streptococcal bacteria also are present in intestines of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, coccoid bacteria that are capable of growth in brain-heart infusion broth. These bacteria are also defined as all the organisms that produce red or pink colonies within 48 hours at $35^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ on KF-streptococcus agar (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

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

Code numbers have been assigned for agencies collecting and analyzing samples, and are listed in water-quality tables of this report as follows:

1028 U.S. Geological Survey
80513 Arkansas District, WRD, USGS
80010 Atlanta Central Laboratory, WRD, USGS
80020 Denver Central Laboratory, WRD, USGS

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.

Cubic foot per second is the rate of discharge representing a volume of 1 cubic foot passing a specified point during 1 second.

Discharge is the volume of water that passes a given point within a given period of time.

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

Mean discharge is the arithmetic average of individual daily mean discharges during a specific period.

Dissolved refers to the material in a representative water sample that passes through a 0.45- micrometer 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 oxygen content of water in equilibrium with air is a function of atmospheric pressure and temperature and the dissolved-solids concentration of the water. The ability of water to retain oxygen decreases with increasing temperature or dissolved solids, with small temperature changes having the more significant effect. Photosynthesis and respiration may cause diurnal variations in dissolved-oxygen concentration in water of some streams.

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

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

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate (CaCO_3).

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

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

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

Suspended-sediment discharge (tons/day) is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight or volume, that passes a section in a given time. It is computed by multiplying discharge by milligrams per liter by 0.0027.

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

Sodium-absorption-ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions with soil and is an index of sodium or alkali hazard to the soil. Water varies, in respect to sodium hazard, from that which can be used for irrigation on almost all soils to that which generally is unsatisfactory for irrigation.

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 concentration 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 and the amount of water flowing past the gage in a channel.

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 that the sample consists of a water-suspended-sediment mixture and that the analytical method determines all of the constituent in the sample.)

COMPUTATION OF ANNUAL YIELD

The annual yield and deficiency (table 1) for each subbasin were computed as described in Appendix I to the Arkansas River Basin Compact Arkansas-Oklahoma, 1972, supplement No. 1. Actual runoff for the subbasins (table 2) was computed as described in the Compact except for the stations Arkansas River at Muskogee, which has been discontinued, and Arkansas River at Van Buren, which has been moved 7.9 miles downstream.

Annual depletion caused by major reservoirs (table 3) was computed for the four major reservoirs in the basin as described in Appendix I to the Compact. Depletion caused by small reservoirs and minor diversion for municipal and agricultural use are considered insignificant at this time and data are not included in tables 1 and 3.

A compilation of the areas and capacities of lakes and ponds in Arkansas, updated in 1981, conducted by the Arkansas Soil and Water Conservation Commission was used to evaluate depletions caused by small reservoirs in the Poteau River, Lee Creek, Spavinaw Creek, and Illinois River subbasins. Analysis shows that their impact on the depletions in any subbasin, except Illinois River, is probably insignificant and further consideration is not necessary at this time. Total storage capacity in the Illinois River subbasin is 27,700 acre-feet of which 18,300 acre-feet is in one lake. There is not enough information presently collected to evaluate the magnitude of depletions in the Illinois River subbasin.

Streamflow data used in the computations are given in hydrologic station records (p. 15 to 38). The station description under "Remarks" states the degree of accuracy of the records. "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the actual discharge, "good" means within 10 percent, and "fair" means within 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Table 1.--Annual yield and deficiency for the subbasins as defined in the
Arkansas-Oklahoma Arkansas River Basin Compact

[Average annual flow in cubic feet per second for 1986 water year]

Subbasin	Actual runoff from the subbasins	Total depletions (+) or accretions (-)	Annual yield	Percent depletion allowed	Minimum required flow	Deficiency
Spavinaw Creek	162	0	162	50	81	0
Illinois River	1,080	0	1,080	60	432	0
Lee Creek	803	0	803	100	0	0
Poteau River	623	0	623	60	249	0
Arkansas River	4,550	+345	4,900	60	1,960	0

Table 2.--Actual runoff from the subbasins

[Mean discharge in cubic feet per second for the 1986 water year; D.A. = drainage area]

Month	Spavinaw Creek D.A.=135 square miles ^a	Illinois River D.A.=744 square miles ^b	Lee Creek D.A.=464 square miles ^c	Poteau River D.A.=536 square miles ^d	Arkansas River D.A.=4,553 square miles ^e
October	77	478	176	76	3,430
November	289	2,640	2,370	1,810	8,930
December	279	1,630	1,210	573	16,420
January	74	389	139	150	464
February	123	774	886	834	4,500
March	100	614	696	201	1,840
April	370	2,310	2,170	1,050	11,790
May	157	907	1,150	844	8,040
June	143	838	380	1,840	6,860
July	47	240	19	106	-2,980 ^f
August	42	422	357	25	-1,350 ^f
September	251	1,770	130	18	-2,880 ^f
1986 water year	162	1,080	803	623	4,550
1986 water year (acre-feet)	117,300	781,900	581,400	451,000	3,294,000

^a Includes 31 square miles ungaged.

^b Includes 63 square miles ungaged.

^c Includes 38 square miles ungaged.

^d Includes 125 square miles ungaged.

^e Computed by subtracting drainage area at Arkansas River at Muskogee, Canadian River near Whitefield, Illinois River Subbasin, Lee Creek Subbasin, and Poteau River Subbasin from drainage area at Arkansas River at Dam No. 13, near Van Buren, Ark.

^f Negative discharge caused by storage in reservoirs, seepage into ground water, and evaporation from reservoirs.

Table 3.---Annual depletion caused by major reservoirs

[1986 water year]

Reservoir	Year-end contents (acre-feet)	Change in contents in water year (acre-feet)	Precipitation on reservoir surface (inch) ^a	Evaporation from reservoir (inch) ^b	Depletion (acre-feet)	Depletion (Average annual cubic feet per second)
Webbers Falls-----	175,600	+3,100	56.21	64.23	+31,290	+43.2
Tenkiller Ferry----	716,500	+61,400	56.70	55.54	+86,100	+119
Robert S. Kerr-----	539,200	+9,900	55.69	62.94	+113,200	+156
Wister-----	58,300	+9,680	40.15	52.03	+19,990	+26.7

^a From U.S. Corps of Engineers, Tulsa District.

^b Adjusted for pan coefficient of 0.70 (from Wisler and Brater, 1949).

SELECTED REFERENCES

- Arkansas River Compact Committee, 1972, Arkansas River Basin Compact Arkansas-Oklahoma, 1972, with Supplemental Interpretive Comments, Supplement No. 1: Austin, Tex., 31 p.
- Arkansas Soil and Water Conservation Commission, 1981, Arkansas State Water Plan - Lakes of Arkansas, 157 p.
- Wisler, C. D., and Brater, E. F., 1949, Hydrology: New York, N.Y., John Wiley & Sons, Inc., 150 p.

HYDROLOGIC STATION RECORDS

STREAMFLOW

07165570 Arkansas River near Haskell, Oklahoma

LOCATION.--Lat 35°49'23", long 95°38'39", in NE 1/4 sec.31, T.16 N., R.16 E., Muskogee County, near right bank on downstream side of bridge on State Highway 104, 2.0 mi east of Haskell, 23.5 mi upstream from Verdigris River, and at mile 483.7.

DRAINAGE AREA.--75,473 mi², of which 12,541 mi² probably is noncontributing.

AVERAGE DISCHARGE.--14 years, 8,894 ft³/s.

EXTREMES.--June 1972 to current year: Maximum discharge, 108,000 ft³/s Nov. 6, 1974; minimum daily, 139 ft³/s Nov. 18, 1982.

REMARKS.--Records good. Flow regulated by Keystone Lake, 55.1 mi upstream.

COOPERATION.--Gage-height record and discharge measurements furnished by Corps of Engineers; records computed by Geological Survey.

Monthly and yearly discharge

Month	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	921,100	52,300	10,800	29,710	1,827,000
November	395,450	25,800	3,300	13,180	784,400
December	381,760	23,900	6,000	12,310	757,200
January	211,893	10,000	933	6,835	420,300
February	92,588	6,520	620	3,307	183,600
March	118,473	12,100	735	3,822	235,000
April	185,670	15,100	1,440	6,189	368,300
May	436,930	25,800	1,380	14,090	866,700
June	386,140	23,900	6,880	12,870	765,900
July	284,290	13,200	3,100	9,171	563,900
August	126,434	9,520	815	4,079	250,800
September	100,206	23,700	326	3,340	198,800
Water Year 1986	3,640,934	52,300	326	9,975	7,222,000

STREAMFLOW

07176000 Verdigris River near Claremore, Oklahoma

LOCATION.—Lat 36°18'26", long 95°41'52", in SE 1/4 SW 1/4 sec.10, T.21 N., R.15 E., Rogers County, near 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 mi².

AVERAGE DISCHARGE.—27 years (water years 1936-62), 3,723 ft³/s; 22 years (water years 1965-86), 4,138 ft³/s.

EXTREMES.—October 1935 to current year: Maximum discharge, 182,000 ft³/s May 21, 1943; no flow at times in 1936, 1939-40, 1956.

REMARKS.—Records fair. Flow regulated since May 1963 by Oologah Lake 14.3 mi upstream; some regulation by dams in Kansas since 1949 and by Hulah Lake since 1950.

COOPERATION.—Gage-height record and discharge measurements furnished by Corps of Engineers; records computed by Geological Survey.

Monthly and yearly discharge

Month	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	292,200	14,400	2,370	9,426	579,600
November	429,270	30,000	5,180	14,310	851,500
December	389,700	29,200	4,500	12,570	773,000
January	85,395	6,700	251	2,755	169,400
February	62,735	4,180	255	2,241	124,400
March	65,944	9,840	165	2,127	130,800
April	193,834	11,300	230	6,461	384,500
May	276,900	15,400	3,180	8,932	549,200
June	197,040	11,600	2,210	6,568	390,800
July	165,586	15,100	926	5,341	328,400
August	29,388	6,890	137	948	58,290
September	87,666	18,700	56	2,922	173,900
Water Year 1986	2,275,658	30,000	56	6,235	4,514,000

STREAMFLOW

07177500 Bird Creek near Sperry, Oklahoma

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, on downstream side 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 mi².

AVERAGE DISCHARGE.--48 years, 507 ft³/s.

EXTREMES.--October 1938 to current year: Maximum discharge, 90,000 ft³/s Oct. 3, 1959; no flow at times in 1939, 1954-57, 1964-66, 1970.

REMARKS.--Records fair.

COOPERATION.--Gage-height record and discharge measurements furnished by Corps of Engineers; records computed by Geological Survey.

Monthly and yearly discharge

Month	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	16,139	4,690	21	526	32,370
November	63,507	9,280	28	2,117	126,000
December	7,144	886	75	230	14,170
January	1,636	75	29	52.8	3,250
February	1,116	47	29	39.6	2,210
March	8,062	3,390	24	260	15,990
April	17,530	5,130	51	584	34,770
May	19,745	4,210	69	637	39,160
June	24,097	4,970	66	803	47,800
July	4,991	1,600	30	161	9,900
August	1,653	430	14	53.3	3,280
September	17,430.4	12,900	9.4	581	34,570
Water Year 1986	183,230.4	12,900	9.4	502	363,400

STREAMFLOW

07191220 Spavinaw Creek near Sycamore, Oklahoma

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, 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 mi².

AVERAGE DISCHARGE.--25 years, 108 ft³/s.

EXTREMES.--October 1961 to current year: Maximum discharge, 39,800 ft³/s July 27, 1975; minimum, 1.2 ft³/s Aug. 9, 1964.

REMARKS.--Records good.

Monthly and yearly discharge					
Month	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	2,363	205	32	76.2	4,690
November	8,558	1,710	52	285	16,970
December	8,527	861	107	275	16,910
January	2,257	102	59	72.8	4,480
February	3,381	227	59	121	6,710
March	3,031	206	67	97.8	6,010
April	10,951	3,600	68	365	21,720
May	4,783	302	97	154	9,490
June	4,223	288	69	141	8,380
July	1,456	68	31	47.0	2,890
August	1,291	59	28	41.6	2,560
September	7,441	6,130	23	248	14,760
Water Year 1986	58,262	6,130	23	160	115,600

07191220 SPAVINAW CREEK NEAR SYCAMORE, OKLAHOMA

WATER-QUALITY RECORDS

PERIOD OF RECORD.—Water years 1968, 1977, January 1980 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[Five-digit numbers in parenthesis are STORET parameter codes used for computer storage of data;
MG/L = milligrams per liter]

DATE	TIME	AGENCY ANA- LY ZING SAMPLE (CODE NUMBER) (00028)	BARO- METRIC PRESSURE (MILLI- METERS OF MERCURY) (00025)	STREAMFLOW, INSTAN- TANEOUS (CUBIC FEET PER SECOND (00061)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00300) (00301)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (00340)
OCT									
17...	1305	80020	740	99	330	6.50	22.0	8.6	102
NOV									
25...	1500	80020	740	236	260	6.40	16.0	9.0	94
DEC									
19...	1500	80020	—	213	242	7.00	11.0	—	10
JAN									
29...	1645	80020	740	63	260	7.40	11.0	11.0	103
FEB									
26...	1415	80020	730	97	250	7.60	12.0	11.0	107
MAR									
28...	1415	80020	740	74	333	7.80	14.0	11.0	110
APR									
29...	1815	80020	740	125	240	7.90	16.0	9.5	99
MAY									
22...	1530	80020	730	165	290	7.87	18.0	9.9	109
JUN									
27...	1445	80020	740	71	270	7.60	21.0	8.0	93
JUL									
24...	1400	1028	740	36	305	7.40	21.0	6.9	80

DATE	HARD- NESS (MG/L AS CAC03) (00900)	HARD- NESS, NONCAR- BONATE (MG/L CAC03) (95902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM ADSORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY LAB (MG/L AS CAC03) (90410)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2) (00405)
OCT										
17...	140	26	54	2.0	6.0	8	0.2	2.6	117	72
NOV										
25...	110	18	40	1.4	4.3	8	.2	2.1	88	68
DEC										
19...	100	15	38	1.2	4.3	8	.2	2.0	85	16
JAN										
29...	110	16	43	1.3	5.2	9	.2	1.9	97	7.5
FEB										
26...	110	14	42	1.3	5.1	9	.2	1.8	96	4.7
MAR										
28...	110	10	42	1.4	4.9	9	.2	1.9	101	3.1
APR										
29...	100	8	39	1.3	4.4	8	.2	2.0	95	2.3
MAY										
22...	110	9	41	1.3	4.4	8	.2	2.2	99	2.6
JUN										
27...	120	3	44	1.4	5.0	8	.2	2.3	113	5.5
JUL										
24...	—	—	—	—	—	—	—	—	—	—

ARKANSAS RIVER BASIN

07191220 SPAVINAW CREEK NEAR SYCAMORE, OKLAHOMA--CONTINUED

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SI02) (00955)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER ACRE- FOOT (70303)	SOLIDS, DIS- SOLVED (TONS PER DAY) (70302)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)
OCT 17...	6.2	12	<0.1	11	160	0.22	44	2.90	0.050
NOV 25...	7.7	6.7	<.1	10	120	.17	80	3.10	.050
DEC 19...	7.1	7.1	<.1	8.4	120	.16	68	2.90	.050
JAN 29...	6.1	11	<.1	7.4	130	.18	23	2.60	—
FEB 26...	6.5	9.6	<.1	7.2	130	.18	34	—	.020
MAR 28...	13	9.6	<.1	7.5	140	.19	28	2.50	.010
APR 29...	5.9	6.8	<.1	8.2	120	.17	42	2.10	.030
MAY 22...	5.8	6.1	<.1	8.6	130	.18	57	2.00	.030
JUN 27...	5.8	8.3	<.1	9.4	140	.2	28	2.30	.030
JUL 24...	—	—	—	—	—	—	—	—	.030

STREAMFLOW

07193500 Neosho River below Fort Gibson Lake, near Fort Gibson, Oklahoma

LOCATION.--Lat 35°51'15", long 95°13'45", in SE 1/4 NW 1/4 sec.19, T.16 N., R.19 E., Cherokee County, on left bank 1.1 mi downstream from Fort Gibson Dam, 4.5 mi north of Fort Gibson, and at mile 6.6.

DRAINAGE AREA.--12,495 mi².

AVERAGE DISCHARGE.--36 years (1950-86), 8,128 ft³/s.

EXTREMES.--May 1950 to current year: Maximum discharge, 223,000 ft³/s May 26, 1957; minimum, 12 ft³/s Oct. 10, 1957, Aug. 23, 1964.

REMARKS.--Records good. Flow completely regulated by Fort Gibson Lake.

COOPERATION.--Gage-height record and discharge measurements furnished by Corps of Engineers; records computed by Geological Survey.

Monthly and yearly discharge					
Month	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	461,220	27,000	7,660	14,880	914,800
November	1,299,500	82,200	14,400	43,320	2,578,000
December	1,036,600	64,200	13,600	33,440	2,056,000
January	224,872	14,100	842	7,254	446,000
February	294,440	13,000	1,170	10,520	584,000
March	225,320	14,300	1,640	7,268	446,900
April	589,450	39,900	6,580	19,650	1,169,000
May	397,180	21,800	4,610	12,810	787,800
June	230,310	12,400	3,300	7,677	456,800
July	153,660	11,700	740	4,957	304,800
August	85,108	6,340	15	2,745	168,800
September	204,068	13,000	988	6,802	404,800
Water Year 1986	5,201,728	82,200	15	14,250	10,318,000

07193500 NEOSHO RIVER BELOW FORT GIBSON LAKE NEAR FORT GIBSON, OKLAHOMA

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.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 496 micromhos September 7, 1975; minimum daily 188 micromhos October 18, 1974.

WATER TEMPERATURE: Maximum daily, 31.5°C July 31, August 1, 1955; minimum daily, 0.0°C January 23-25, 1962.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[Five-digit numbers in parenthesis are STORET parameter codes used for computer storage of data; UM-MF = micrometer membrane filter; MG/L = milligrams per liter; K = plate count outside ideal range; IT-FLD = incremental titration-field; UG/L = micrograms per liter]

DATE	TIME	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	BARO- METRIC PRESSURE (MILLI- METERS OF MERCURY)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	PH (STAND- ARD UNITS)	TEMPER- ATURE (DEG C)	TURBIDITY (NEPHELO- METRIC UNITS)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PERCENT SATUR- ATION)	COLIFORM, FECAL, 0.7 UM-MF PER 100 ML	STREP- TOCOCCHI FECAL, KF AGAR PER 100 ML
DEC 31...	1630	80020	738	226	7.80	5.0	23	--	--	--	--
JAN 22...	1600	80020	760	286	7.50	8.0	18	11.5	97	K4	K6
APR 23...	1430	80020	743	--	8.30	13.0	5.0	10.0	--	K4	K2
JUL 31...	1615	80020	746	290	8.20	30.0	1.5	5.8	79	40	38
AUG 26...	1430	80020	750	298	8.20	30.0	1.6	7.2	97	K10	K11
SEP 24...	1630	80020	740	292	8.30	27.0	5.0	6.8	88	--	--

DATE	HARD- NESS (MG/L AS CAC03) (00900)	HARD- NESS, NONCAR- BONATE (MG/L CAC03) (95902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CAR- BONATE IT-FLD (MG/L AS C03) (99445)	BICAR- BONATE IT-FLD (MG/L AS HC03) (99440)	ALKA- LITY, CARBON- ATE IT-FLD (MG/L - CAC03) (99430)
DEC 31...	92	25	30	4.2	4.9	10	0.2	0.6	0	82	67
JAN 22...	100	20	33	4.6	5.4	10	.2	3.9	0	99	81
APR 23...	150	31	47	6.8	8.9	12	.3	2.7	0	139	114
JUL 31...	120	28	38	6.0	9.2	14	.4	3.1	0	112	92
AUG 26...	120	22	37	5.9	8.9	14	4	3.0	0	116	95
SEP 23...	130	30	40	6.6	10	14	.4	3.4	0	118	97

DATE	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02) (00405)	SULFATE DIS- SOLVED (MG/L AS S04) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER ACRE- FOOT) (70303)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)
DEC 31...	2.1	16	5.6	0.1	8.9	124	110	0.17	0.74
JAN 22...	5.0	20	7.2	.1	8.7	136	130	.18	.90
APR 23...	1.1	43	9.9	.1	3.7	197	190	.27	.89
JUL 31...	1.1	38	9.3	.2	2.9	160	160	.22	--
AUG 26...	1.2	34	8.8	.2	3.9	164	160	.22	<.10
SEP 23...	.9	38	10	.3	3.5	193	170	.26	.18

ARKANSAS RIVER BASIN

07193500 NEOSHO RIVER BELOW FORT GIBSON LAKE NEAR FORT GIBSON, OKLAHOMA—CONTINUED

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4) (71846)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	PHOS- PHORUS, TOTAL (MG/L AS PO4) (71886)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4) (00660)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)
DEC 31...	0.08	0.1	0.7	0.11	0.34	0.07	0.05	0.15	40	<1
JAN 22...	.05	.06	.6	.10	—	.07	.07	.21	—	—
APR 23...	.05	.06	.6	.06	—	.04	.03	.09	—	—
JUL 31...	—	—	—	—	—	—	—	—	20	1
AUG 26...	<.01	—	.8	.06	—	.03	.02	.06	—	—
SEP 23...	<.01	—	.7	.09	—	.05	.04	.12	<10	<1
DATE	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01055)
DEC 31...	51	<0.5	<1	<1	<3	5	80	<1	<4	21
JAN 22...	—	—	—	—	—	—	—	—	—	—
APR 23...	—	—	—	—	—	—	—	—	—	—
JUL 31...	67	<.5	<1	<1	<3	4	<3	<5	<4	120
AUG 26...	—	—	—	—	—	—	—	—	—	—
SEP 23...	71	<.5	<1	<1	<3	3	37	<5	5	5
DATE	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDIMENT DISCHARGE SUS- PENDE (T/DAY) (80155)
DEC 31...	0.2	<10	1	<1	<1	120	<6	39	22	838
JAN 22...	—	—	—	—	—	—	—	—	15	99
APR 23...	—	—	—	—	—	—	—	—	12	703
JUL 31...	.1	<10	<1	<1	<1	190	<6	41	11	150
AUG 26...	—	—	—	—	—	—	—	—	15	41
SEP 23...	<.1	<10	1	<1	<1	210	<6	10	—	—

STREAMFLOW

07194500 Arkansas River near Muskogee, Oklahoma

LOCATION.—Lat 35°46'10", long 95°17'55", in NW 1/4 sec.21, T.15 N., R.19 E., Muskogee County, at bridge on U.S. Highway 62, 1.7 mi downstream from Neosho River, 3.5 mi northeast of Muskogee.

DRAINAGE AREA.—96,674 mi² of which 12,541 mi² probably is noncontributing.

REMARKS.—Gaging station discontinued Sept. 30, 1970, due to backwater conditions. Streamflow computed by combining flow at station 07165570 Arkansas River near Haskell, station 07176000 Verdigris River near Claremore, station 07177500 Bird Creek near Sperry, station 07193500 Neosho River below Fort Gibson Lake near Fort Gibson, and adjusting the total for the ungaged intervening drainage area.

Monthly and yearly discharge		
Month	Mean (ft ³ /s)	Runoff in acre-feet
October	55,280	3,399,000
November	75,890	4,516,000
December	58,870	3,620,000
January	16,970	1,043,000
February	16,160	897,500
March	13,840	851,000
April	33,710	2,006,000
May	37,360	2,297,000
June	29,050	1,729,000
July	19,860	1,221,000
August	7,901	485,800
September	14,460	860,400
Water Year 1986	31,660	22,920,000

STREAMFLOW

07195500 Illinois River near Watts, Oklahoma

LOCATION.--Lat 36°07'48", long 94°34'12", in NE 1/4 sec.18, T.19 N., R.26 E., Adair County, near right bank on downstream side 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 mi².

AVERAGE DISCHARGE.--31 years, 577 ft³/s.

EXTREMES.--August 1955 to current year: Maximum discharge, 68,000 ft³/s July 25, 1960; minimum, 8.6 ft³/s Oct. 26, 1955, Sept. 19, Oct. 14, 1956.

REMARKS.--Records good. Some regulation at low flow by Lake Frances Dam, 0.8 mi above station. Since July 2, 1957, small diversion above station for municipal water supply for city of Siloam Springs, Ark.

COOPERATION.--Gage-height record and discharge measurements furnished by Corps of Engineers; records computed by Geological Survey.

Monthly and yearly discharge

Month	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	10,764	1,760	144	347	21,350
November	52,757	19,100	182	1,759	104,600
December	37,315	5,030	474	1,204	74,010
January	10,462	467	260	337	20,750
February	18,209	2,050	261	650	36,120
March	16,345	1,750	301	527	32,420
April	59,278	12,300	320	1,976	117,600
May	24,106	1,750	396	778	47,810
June	19,886	2,280	278	663	39,440
July	6,860	322	167	221	13,610
August	9,129	772	80	294	18,110
September	41,778	22,100	99	1,393	82,870
Water Year 1986	306,889	22,100	80	841	608,700

STREAMFLOW

07195800 Flint Creek at Springtown, Arkansas

LOCATION.—Lat 36°15'20", long 94°25'50", in NW 1/4 sec. 7, T.18 N., R.32 W., Benton County, Hydrologic Unit 11110103, on right bank 20 ft downstream from State Highway 12, 0.8 mi southwest of Springtown.

DRAINAGE AREA.—14.2 mi².

AVERAGE DISCHARGE.—25 years, 14.0 ft³/s

EXTREMES.—June 1961 to current year: Maximum discharge, 14,600 ft³/s
June 8, 1974; no flow for part of July 9, 29, 30, Aug. 7, 1964,
Sept. 16, 1980.

REMARKS.—Records good.

Month	Monthly and yearly discharge				
	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	476.9	53	6.2	15.4	946
November	1,264.8	292	7.9	42.2	2,510
December	1,188	139	17	38.3	2,360
January	394.9	17	9.9	12.7	783
February	454	26	10	16.2	901
March	357.4	19	9.2	11.5	709
April	1,631.2	400	9.2	54.4	3,240
May	634	47	12	20.5	1,260
June	755.9	96	9.9	25.2	1,500
July	239.9	10	5.8	7.74	476
August	518.9	48	6.4	16.7	1,030
September	1,148.6	704	7.0	38.3	2,280
Water Year 1986	9,064.5	704	5.8	24.8	17,980

STREAMFLOW

07196900 Baron Fork at Dutch Mills, Arkansas

LOCATION.--Lat 35°52'48", long 94°29'11", on line between secs.21 and 22, T.14 N., R.33 W., Washington County, near right bank on downstream side of bridge on State Highway 59 at Dutch Mills, 2.2 mi downstream from Fly Creek, and 2.9 mi upstream from Arkansas-Oklahoma State line.

DRAINAGE AREA.--46.0 mi².

AVERAGE DISCHARGE.--28 years, 39.5 ft³/s.

EXTREMES.--April 1958 to current year: Maximum discharge, 20,900 ft³/s
November 18, 1985; no flow at times.

REMARKS.--Records good.

Monthly and yearly discharge					
Month	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	1,276.9	602	1.7	41.2	2,530
November	10,419.7	4,030	1.9	347	20,670
December	4,881	700	29	157	9,680
January	449.1	26	9.0	14.5	891
February	1,403.6	260	9.7	50.1	2,780
March	1,159	278	12	37.4	2,300
April	3,780	740	17	126	7,500
May	1,522	225	15	49.1	3,020
June	1,744.0	375	9.0	58.1	3,460
July	127.69	10	.99	4.12	253
August	1,167.98	470	.98	37.7	2,320
September	4,391.4	3,400	4.3	146	8,710
Water Year 1986	32,323.37	4,030	.98	88.6	64,110

STREAMFLOW

07245000 Canadian River near Whitefield, Oklahoma

LOCATION.—Lat 35°15'45", long 95°14'19", in SE 1/4 SE 1/4 sec.12, T.9 N., R.19 E., Haskell County, near right bank on downstream side of bridge on State Highway 2, 0.8 mi north of Whitefield, 5.5 mi upstream from Taleka (Snake) Creek, 8.2 mi downstream from Eufaula Dam, and at mile 18.8.

DRAINAGE AREA.—47,576 mi², of which 9,700 mi² is probably noncontributing.

AVERAGE DISCHARGE.—25 years (water years 1939-63), 6,005 ft³/s; 19 years (water years 1968-86), 5,485 ft³/s.

EXTREMES.—July 1938 to current year: Maximum discharge, 281,000 ft³/s May 10, 1943; minimum daily, 0.4 ft³/s Oct. 8, 1956.

REMARKS.—Records good. Prior to February 1964, occasional slight regulation by Conchas Lake in New Mexico and except for 54 mi² of intervening area, completely regulated thereafter by Eufaula Lake.

COOPERATION.—Gage-height record and discharge measurements furnished by Corps of Engineers; records computed by Geological Survey.

Monthly and yearly discharge					
Month	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	200,909	16,200	36	6,481	398,500
November	257,006	16,000	386	8,567	509,800
December	530,620	30,700	5,370	17,120	1,052,000
January	201,120	11,300	1,640	6,488	398,900
February	178,020	9,960	2,900	6,358	353,100
March	133,937	9,060	123	4,321	265,700
April	334,100	22,800	5,620	11,140	662,700
May	516,830	33,800	3,340	16,670	1,025,000
June	441,640	33,700	4,790	14,720	876,000
July	80,183	10,600	70	2,587	159,000
August	64,786	5,560	94	2,090	128,500
September	50,992	4,550	42	1,700	101,100
Water Year 1986	2,990,143	33,800	36	8,192	5,931,000

07245000 CANADIAN RIVER NEAR WHITEFIELD, OKLAHOMA
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.—Water years 1944-64, 1967 to current year.

PERIOD OF DAILY RECORD.—

SPECIFIC CONDUCTANCE: September 1944 to February 1945, September 1946 to September 1964, October 1966 to current year.

WATER TEMPERATURE: September 1944 to February 1945, September 1946 to September 1964, October 1966 to current year.

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 DAILY RECORD.—

SPECIFIC CONDUCTANCE: Maximum daily, 22,900 micromhos November 11, 1956; minimum daily, 36 micromhos May 19, 1980.

WATER TEMPERATURE: Maximum daily, 39.0°C, July 16, 1981; minimum, 0.0°C on January 31, February 1-2, 1985.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[Five-digit numbers in parenthesis are STORET parameter codes used for computer storage of data; IT-FLD = incremental titration - field; MG/L = milligrams per liter; UG/L = micrograms per liter; UM-MF = micrometer membrane filter; K = plate count outside ideal range]

		AGENCY ANA- LY ZING SAMPLE (CODE NUMBER) (00028)	BARO- METRIC PRESSURE (MILLI- METERS OF MERCURY) (00025)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS) (00095)	PH (STAND- ARD UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)	TURBIDITY (NEPHELO- METRIC TURBIDITY UNITS) (00076)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED CENT SATUR- ATION) (00301)	COLI- FORM, FECAL, 0.7 UM-MF (COLONIES 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLONIES PER 100 ML) (31673)	
DATE	TIME											
OCT 23...	1145	80020	760	471	7.60	22.5	14	7.7	89	120	82	
NOV 13...	1300	80020	760	531	7.90	18.5	9.0	8.9	95	49	51	
JAN 22...	1400	80020	770	379	7.71	9.0	32	10.6	91	K7	—	
MAR 04...	1430	80020	770	365	7.60	14.0	31	12.2	117	K4	K4	
MAY 27...	1530	80020	760	444	7.96	23.0	30	12.4	145	10	8	
JUL 08...	1130	80020	760	409	7.89	27.5	2.2	10.8	137	20	7	
SEP 17...	1115	80020	760	244	7.76	23.0	110	11.4	133	9,400	11,000	
		HARD- NESS (MG/L AS CAC03) (00900)	HARD- NESS, NONCAR- BONATE (MG/L CAC03) (00902)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	POTAS- SIUM, DIS- SOLVED SODIUM ADSORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CAR- BONATE IT-FLD (MG/L AS CO3) (99445)	BICAR- BONATE IT-FLD (MG/L AS HCO3) (99440)	ALKA- LITY, CARBON- ATE IT-FLD (MG/L - CAC03) (99430)
OCT 23...	130	30	33	12	34	35	1	3.2	0	124	102	
NOV 13...	130	27	33	12	35	36	1	3.4	0	128	105	
JAN 22...	110	22	28	9.8	31	37	1	3.6	0	108	89	
MAR 04...	100	23	26	9.6	30	37	1	3.5	0	100	82	
MAY 27...	120	15	30	11	38	40	2	3.2	0	86	105	
JUL 08...	140	2	36	11	33	34	1	3.3	0	110	134	
SEP 17...	79	—	20	7.1	20	34	1	3.2	0	70	85	

ARKANSAS RIVER BASIN

07245000 CANADIAN RIVER NEAR WHITEFIELD, OKLAHOMA—CONTINUED

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2) (00405)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SI02) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	SOLIDS, DIS- SOLVED (TONS PER AC-FT) (70303)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)
OCT 23...	4.9	24	56	0.3	3.9	228	230	0.31	0.24	0.06
NOV 13...	2.6	26	57	.2	43	240	270	.33	.15	.01
JAN 22...	3.3	18	49	.2	5.9	202	200	.27	.48	.08
MAR 04...	4.0	20	46	.3	6.2	204	190	.28	.48	.04
MAY 27...	1.5	34	59	.2	5.5	251	220	.34	.53	.13
JUL 08...	2.3	31	49	.2	7.3	245	230	.33	.36	.03
SEP 17...	1.9	20	28	.2	5.3	183	140	.25	.18	.07
DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4) (71846)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	PHOS- PHORUS, TOTAL (MG/L AS PO4) (71886)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4) (00660)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)
OCT 23...	0.08	0.4	0.05	0.15	0.03	0.02	0.06	20	1	110
NOV 13...	.01	.5	.05	.15	.03	.01	.03	—	—	—
JAN 22...	.1	.5	.07	—	.06	.05	.15	30	1	110
MAR 04...	.05	.4	.08	—	.05	.05	.15	30	1	85
MAY 27...	.17	.5	.11	—	.06	.04	.12	—	—	—
JUL 08...	.04	.3	.05	—	.19	.16	.49	<10	<1	120
SEP 17...	.09	.9	.10	—	.09	.02	.06	—	—	—

ARKANSAS RIVER BASIN

07245000 CANADIAN RIVER NEAR WHITEFIELD, OKLAHOMA—CONTINUED

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)
OCT 23...	<0.5	1	<1	<3	4	11	1	9	28	0.1
NOV 13...	—	—	—	—	—	—	—	—	—	—
JAN 22...	.5	<1	<1	<3	3	18	3	6	6	—
MAR 04...	<1	<1	<1	<3	2	24	2	4	4	—
MAY 27...	—	—	—	—	—	—	—	—	—	—
JUL 08...	<.5	1	<1	<3	3	15	<5	8	31	<.1
SEP 17...	—	—	—	—	—	—	—	—	—	—

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDIMENT DISCHARGE SUS- PENDE (T/DAY) (80155)	SEDIMENT SUSPENDED SIEVE DIAMETER PERCENT FINER THAN .062 MILLIMETER (70331)
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	2,550	86
JUL 08...	<10	2	<1	<1	310	<6	22	6	5.5	86
SEP 17...	—	—	—	—	—	—	—	194	220	89

STREAMFLOW

07247000 Poteau River at Cauthron, Arkansas

LOCATION.--Lat 34°55'08", long 94°17'55", in NW 1/4 SW 1/4 sec.16, T.3 N., R.31 W., Scott County, on right bank at downstream side of highway bridge at Cauthron, 2.9 mi downstream from Cross Creek, 7.8 mi downstream from Jones Creek, and at mile 109.0.

DRAINAGE AREA.--203 mi².

AVERAGE DISCHARGE.--47 years, 219 ft³/s.

EXTREMES.--February 1939 to current year: Maximum discharge, 32,200 ft³/s May 20, 1960; no flow at times in most years.

REMARKS.--Records good. As of September 1974, flow from 92.2 mi² above this station is controlled by 16 floodwater-detention reservoirs with a total combined capacity of 39,082 acre-ft below the flood spillway crests, of which 33,524 acre-ft is flood-detention capacity, 2,100 acre-ft is water-supply storage, and 3,458 acre-ft is sediment-storage capacity.

Monthly and yearly discharge

Month	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	920.0	234	3.4	29.7	1,820
November	19,553.8	11,000	1.6	652	38,780
December	7,455	770	44	240	14,790
January	2,148	406	26	69.3	4,260
February	8,705	2,180	38	311	17,270
March	1,856	250	24	59.9	3,680
April	12,544	3,330	25	418	24,880
May	13,286	2,510	53	429	26,350
June	25,393	4,460	94	846	50,370
July	1,366.0	303	2.0	44.1	2,710
August	345.0	50	1.6	11.1	684
September	193.6	33	1.5	6.45	384
Water Year 1986	93,765.4	11,000	1.5	257	186,000

STREAMFLOW

07249400 James Fork near Hackett, Arkansas

LOCATION.--Lat 35°09'45", long 94°24'25", in NW 1/4 NW 1/4 sec.34, T.6 N., R.32 W., Sebastian County, near left bank on downstream side of bridge on State Highway 45, 1.7 mi south of Hackett, 2.0 mi downstream from Elder Branch, 2.0 mi upstream from small tributary, and 3.6 mi upstream from Arkansas-Oklahoma State line.

DRAINAGE AREA.--147 mi².

AVERAGE DISCHARGE.--28 years, 135 ft³/s.

EXTREMES.--April 1958 to current year: Maximum discharge, 30,000 ft³/s
May 14, 1968; no flow at times.

REMARKS.--Records good.

Monthly and yearly discharge					
Month	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	612.0	96	2.9	19.7	1,210
November	16,281.4	7,160	4.0	543	32,290
December	3,983	527	45	128	7,900
January	776.7	45	5.8	25.1	1,540
February	6,592.5	1,330	5.5	235	13,080
March	2,326	243	41	75.0	4,610
April	7,929	2,890	43	264	15,730
May	2,833	614	33	91.4	5,620
June	9,458	2,750	38	315	18,760
July	735.5	91	2.0	23.7	1,460
August	168.8	26	1.5	5.45	335
September	, 163.0	, 40	2.0	5.43	323
Water Year 1986	51,858.9	7,160	1.5	142	102,900

STREAMFLOW

07250000 Lee Creek near Van Buren, Arkansas

LOCATION.—Lat 35°29'40", long 94°26'58", in SE 1/4 sec.21, T.12 N., R.27 E., Indian Meridian, Sequoyah County, Okla., on right bank 300 ft west of Arkansas-Oklahoma State line, 3.2 mi downstream from Webbers Creek, 6.8 mi northwest of Van Buren, and at mile 7.8.

DRAINAGE AREA.—426 mi².

AVERAGE DISCHARGE.—42 years (1930-36, 1950-86), 501 ft³/s.

EXTREMES.—September 1930 to June 1937, October 1950 to current year: Maximum discharge, 80,600 ft³/s (2,280 m³/s) May 6, 1960; no flow at times.

REMARKS.—Records good.

Monthly and yearly discharge					
Month	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	5,029.8	1,690	1.1	162	9,980
November	65,176	31,100	35	2,173	129,300
December	34,484	4,430	249	1,112	68,400
January	3,931	233	72	127	7,800
February	22,801	3,180	67	814	45,230
March	19,884	3,740	161	641	39,440
April	59,856	5,840	268	1,995	118,700
May	32,772	4,190	262	1,057	65,000
June	10,480	2,300	42	349	20,790
July	573.8	52	5.0	18.5	1,140
August	10,206.0	5,170	4.7	329	20,240
September	3,605	795	12	120	7,150
Water Year 1986	268,798.6	31,100	1.1	736	533,200

STREAMFLOW

07250550 Arkansas River at Dam No. 13, near Van Buren, Arkansas

LOCATION.—Lat 35°20'56", long 94°17'54", in sec.28, T.8 N., R.31 W., Sebastian County, in Dam No. 13 control house on right bank, and at mile 308.9.

DRAINAGE AREA.—150,547 mi², of which 22,241 mi² is probably noncontributing.

AVERAGE DISCHARGE.—59 years, 31,540 ft³/s.

EXTREMES.—October 1927 to current year: Maximum discharge, 850,000 ft³/s (24,100 m³/s) May 12, 1943; no flow Nov. 2, 1975, Feb. 1, 1981.

REMARKS.—Records fair. Prior to October 1969, published as 07250500 Arkansas River at Van Buren. Beginning Apr. 26, 1970, daily discharge computed from relation between discharge, head, and gate openings. Flow regulated by many locks, dams, and reservoirs upstream.

Monthly and yearly discharge

Month	Total (ft ³ /s)	Maximum daily (ft ³ /s)	Minimum daily (ft ³ /s)	Mean (ft ³ /s)	Runoff in acre-feet
October	2,033,800	115,000	24,000	65,610	4,034,000
November	3,006,100	193,000	32,000	100,200	5,963,000
December	2,970,600	146,000	43,900	95,830	5,892,000
January	762,510	42,900	5,130	24,600	1,512,000
February	826,260	55,200	6,960	29,510	1,639,000
March	666,910	46,800	6,680	21,510	1,323,000
April	1,865,200	108,000	12,300	62,170	3,700,000
May	2,014,100	110,000	25,100	64,970	3,995,000
June	1,610,700	92,300	29,500	53,690	3,195,000
July	614,760	33,900	4,690	19,830	1,219,000
August	292,860	22,200	1,870	9,447	580,900
September	456,078	49,700	78	15,200	904,600
Water Year 1986	17,119,878	193,000	78	46,900	33,960,000

07250550 ARKANSAS RIVER AT DAM NO. 13, NEAR VAN BUREN, ARKANSAS--CONTINUED
(National tritium station)
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.—October 1969 to current year.

PERIOD OF DAILY RECORD.—

SPECIFIC CONDUCTANCE: October 1969 to September 1981.

WATER TEMPERATURES: October 1969 to September 1972, March 1974 to September 1981.

SUSPENDED SEDIMENT DISCHARGE: October 1970 to September 1981.

INSTRUMENTATION.—Water-quality monitor December 1969 to September 1981.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

[Five-digit numbers in parenthesis are STORET parameter codes used for computer storage of data;
UM-MF = micrometer membrane filter; UG/L = micrograms per liter; MG/L = milligrams per liter]

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER) (00027)	AGENCY ANALYZING SAMPLE (CODE NUMBER) (00028)	STREAMFLOW INSTANTANEOUS (CUBIC FEET PER SECOND) (00061)	SPECIFIC CONDUCTANCE (MICRO-SIEMENS) (00095)	PH (STANDARD UNITS) (00400)	TEMPERATURE (DEG C) (00010)	TURBIDITY (NEPHELOMETRIC UNITS) (00076)	OXYGEN, DISSOLVED (MG/L) (00300)	OXYGEN, DISSOLVED (PERCENT SATURATION) (00301)	
OCT 1985											
02...	0700	80513	80010	37,200	529	8.20	18.0	4.0	7.2	76	
DEC											
30...	1245	80513	80020	50,700	549	7.40	5.0	25	13.2	105	
FEB 1986											
13...	0730	80513	80020	30,900	550	8.60	4.5	25	13.9	107	
APR											
17...	0700	80513	80020	56,600	482	7.90	13.0	37	8.2	78	
JUN											
11...	0700	80513	80020	78,700	370	8.00	25.0	44	8.0	97	
AUG											
20...	0630	80513	80020	15,400	531	8.20	28.0	4.7	7.6	98	
DATE		BAROMETRIC PRESSURE (MILLI-METERS OF MERCURY) (00025)	COLIFORM, FECAL, 0.7 UM-MF (COLONIES PER 100 ML) (31625)	STREP-TOCOCICI, FECAL, KF AGAR (COLONIES PER 100 ML) (31673)	HARD-NESS (MG/L AS CAC03) (00900)	HARD-NESS, NONCARBONATE (MG/L AS CAC03) (00902)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNESIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	PERCENT SODIUM (00932)	
OCT 1985											
02...		765	27	110	140	28	40	8.8	51	44	
DEC											
30...		754	500	77	120	32	34	7.7	56	50	
FEB 1986											
13...		768	120	—	120	40	33	9.0	65	53	
APR											
17...		762	16	55	110	34	32	7.2	50	49	
JUN											
11...		760	380	1,100	98	26	27	7.4	37	44	
AUG											
20...		757	88	540	130	28	36	8.7	68	53	
DATE		SODIUM ADSORPTION RATIO (00931)	POTASSIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKALINITY LAB (MG/L AS CAC03) (90410)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLORIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUORIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L) (70301)	SOLIDS, DIS-SOLVED (TONS PER ACRE-FOOT) (70303)
OCT 1985											
02...		2	3.2	109	39	74	0.3	2.6	295	280	0.4
DEC											
30...		2	3.9	85	44	91	.2	7.1	290	300	.39
FEB 1986											
13...		3	2.9	80	47	98	.1	5.8	302	310	.41
APR											
17...		2	2.6	74	34	72	.1	4.6	259	250	.35
JUN											
11...		2	2.6	71	32	54	.2	5.2	223	210	.3
AUG											
20...		3	3.5	97	47	110	.2	2.4	375	340	.51

ARKANSAS RIVER BASIN

07250550 ARKANSAS RIVER AT DAM NO. 13, NEAR VAN BUREN, ARKANSAS—CONTINUED

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS, TOTAL (MG/L AS P) (00665)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BIARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)
OCT 1985										
02...	<0.10	0.02	0.5	0.05	0.04	<0.01	10	1	100	2
DEC										
30...	.57	.12	1.0	.13	.08	.07	—	—	—	—
FEB 1986										
13...	.30	.03	.9	.08	.01	.02	120	<1	64	< .5
APR										
17...	.43	.05	.7	.11	.04	.03	—	—	—	—
JUN										
11...	.42	.07	.6	.18	.06	.05	—	—	—	—
AUG										
20...	<.10	.09	.7	.08	.03	.03	20	2	75	< .5
DATE	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)
OCT 1985										
02...	<1	<1	<3	4	7	4	9	8	<0.1	<10
DEC										
30...	—	—	—	—	—	—	—	—	—	—
FEB 1986										
13...	<1	<1	<3	1	97	<1	<4	13	.1	<10
APR										
17...	—	—	—	—	—	—	—	—	—	—
JUN										
11...	—	—	—	—	—	—	—	—	—	—
AUG										
20...	2	<1	<3	<1	9	<5	12	2	.1	<10
DATE	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDIMENT DIS- CHARGE, SUSPENDE (TONS PER DAY) (80155)	SEDIMENT SUSPENDE SIEVE DIAMETER PERCENT FINER THAN .062 MILLIMETER (70331)		
OCT 1985										
02...	1	<1	<1	310	12	12	1,210	91		
DEC										
30...	—	—	—	—	—	31	4,240	73		
FEB 1986										
13...	<1	<1	<1	280	32	33	2,750	92		
APR										
17...	—	—	—	—	—	67	10,200	72		
JUN										
11...	—	—	—	—	—	58	12,300	89		
AUG										
20...	1	<1	<1	300	9	16	665	53		