Storage Requirements For Arkansas Streams

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1859-G

Prepared in cooperation with the Arkansas Geological Commission

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By JAMES L. PATTERSON

CONTRIBUTIONS TO THE HYDROLOGY OF THE UNITED STATES

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CONTENTS

ILLUSTRATIONS

TABLES

CONTRIBUTIONS TO THE HYDROLOGY OF THE UNITED STATES

STORAGE REQUIREMENTS FOR ARKANSAS STREAMS

By JAMES L. PATTERSON

ABSTRACT

The supply of good-quality surface water in Arkansas is abundant. Owing to seasonal and annual variability of streamflow, however, storage must be provided to insure dependable year-round supplies in most of the State. Storage requirements for draft rates that are as much as 60 percent of the mean annual flow at 49 continuous-record gaging stations can be obtained from tabular data in this report.

Through regional analyses of streamflow data, the State was divided into three regions. Draft-storage diagrams for each region provide a means of estimating storage requirements for sites on streams where data are scant, provided the drainage area, the mean annual flow, and the low-flow index are known. These data are tabulated for 53 gaging stations used in the analyses and for 132 partial-record sites where only base-flow measurements have been made. Mean annual flow can be determined for any stream whose drainage lies within the State by using the runoff map in this report. Low-flow indices can be estimated by correlating base flows, determined from several discharge measurements, with concurrent flows at nearby continuous-record gaging stations, whose low-flow indices have been determined.

INTRODUCTION

Total available water resources in Arkansas greatly exceed the present and probable needs. The seasonal and yearly variability of streamflow is, however, such that a dependable year-round surface-water supply without storage is not available in much of the State, even for modest demands. The average surface-water discharge for Arkansas is about 1.3 cfs per sq mi (cubic feet per second per square mile), or about 70,000 cfs. Average discharge ranges from about 0.9 cfs per sq mi in the extreme northwestern and southwestern parts of the State to more than 1.8 cfs per sq mi in the Boston and Ouachita Mountains. An average of about 1,410 cfs, principally from storage reservoirs, was used from surface-water sources during 1965. This value represents an increase of more than 50 percent since 1960, but is only 2 percent of the average discharge. Indications are that surface-water use in Arkansas will increase greatly during the next 30–50 years.

Sound development of water resources to meet the ever-increasing water demand requires basic data to define streamflow characteristics and analyses of these data to develop methods of estimating storage requirements to meet specific needs. The Water Resources Division of the U.S. Geological Survey has a continuing program designed to collect these basic data. A previous report by Hines (1965) presents a summary of low-flow frequency and flow-duration data for many streams in Arkansas.

PURPOSE AND SCOPE

The purpose of this report is to provide a means by which a potential user of water from a particular stream can determine the storage required to meet a certain draft rate during drought periods. This purpose is accomplished in part by defining draft-storage relations for streams where continuous-record gaging stations are located. Gaging stations cannot be operated at all the possible sites where draft-storage data might be required; therefore, to extend the usefulness of the present gaging-station network, draft-storage relations at the gaging-station sites were used to develop regional draft-storage curves from which storage requirements can be estimated at sites where only a few base-flow measurements are made.

In general, draft-storage relations were computed at gaging stations on streams having continuous discharge records of 10 years or more and not materially affected by regulation. Most of the large streams are regulated to some extent; therefore, only streams having drainage areas of about 2,000 square miles or less above the gaged site were used in the analysis. Draft-storage relations in this report are not applicable to regulated streams.

Storage requirements were computed for draft rates that are as much as 60 percent of the mean annual flow (table 2). For draft rates greater than 50 or 60 percent of the mean annual flow, required storage increases much faster than allowable draft. Surface storage is limited in much of the eastern part of the State because of flat terrain, and although storage requirements were computed for draft rates as much as 60 percent of mean annual flow for the purpose of regionalization, the higher storage values for the eastern part of the State are not shown in this report.

ACKNOWLEDGMENTS

This report was prepared by the Water Resources Division of the U.S. Geological Survey in cooperation with the Arkansas Geological Commission. Some of the data were collected in cooperation with other Federal agencies, principally the U.S. Army Corps of Engineers.

METHOD OF ANALYSES

An analysis of storage requirements to insure dependable draft rates requires data on streamflow characteristics. Ideally, a long-term record of daily flows should be available at the damsite. Unfortunately, this ideal situation is seldom realized. In this report, draft-storage relations have been developed at points on streams where continuous records of streamflow are available, and these relations have been regionalized to permit storage requirements to be estimated where information is scant.

The traditional method of storage analysis is based on the mass curve of streamflow for the period of record. Details of this method are given in texts on water supply, but are not discussed here. This method is not suitable for an analysis of the optimum development of available streamflow, nor does it permit evaluation of the probability of a given storage being deficient; therefore, it was not used.

For convenience of analyses, separate analyses were made of within-year and over-year storage requirements, according to the time required for replenishment. Within-year storage was analyzed on a frequency basis by the use of frequency-mass curves. For droughts having recurrence intervals greater than 5 years, over-year storage must be considered for draft rates that exceed 0.3–0.5 of the mean annual discharge. The analysis of over-year storage is based on probability routing of mean annual discharge to define storage requirement related to the mean annual discharge and the variability of the annual discharges. Both analyses are explained in more detail in the following sections.

WITHIN-YEAR STORAGE

Low-flow frequency-curve series, based on annual minimum flows for various period lengths, were used in computing within-year storage requirements. These curves were explained and presented in tabular form by Hines (1965). Data from the frequency curves were used to prepare frequency-mass curves, which in turn were used to compute storage requirements for various draft rates.

To illustrate this method, a within-year draft-storage analysis for Strawberry River at Evening Shade is detailed below. Figure 1 shows low-flow frequency curves for Strawberry River near Evening Shade for periods from 7 days to 1 year. From these curves, a curve relating volume to period of minimum discharge (frequency-mass curve) was prepared for recurrence intervals of 2, 5, 10, and 20 years. Figure 2 shows such a curve for a 20-year recurrence interval. This curve was computed by miltiplying the number of days times the corresponding discharge (ordinate scale in fig. 1) for a recurrence

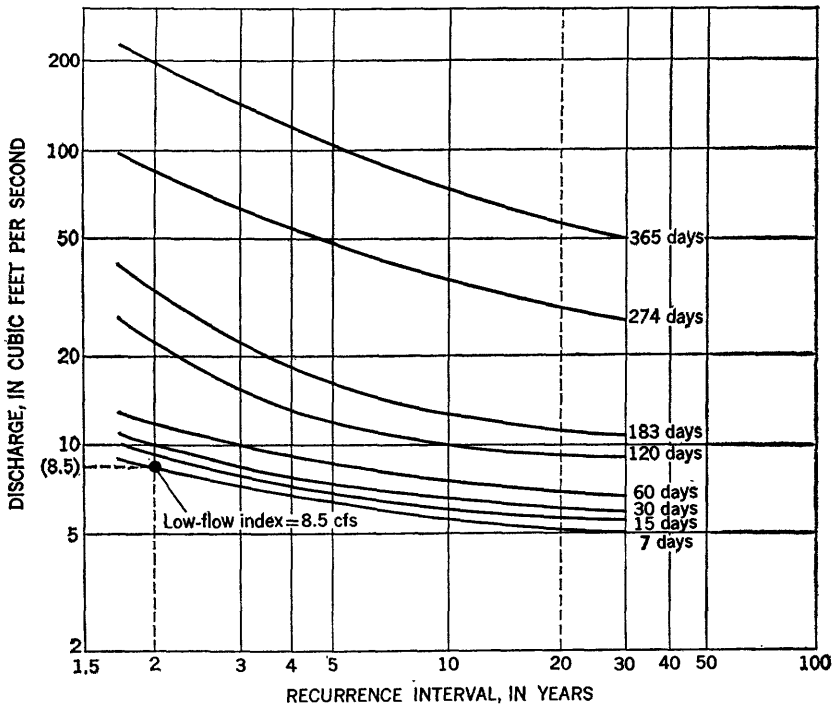

FIGURE 1.—Magnitude and frequency of annual low-flow periods for Strawberry River near Evening Shade.

interval of 20 years. This value, in cubic feet per second–days, was plotted against the number of days. The curve drawn through the plotted points represents the volume of discharge available during a drought that would occur on the average of once in 20 years. Any desired constant draft rate can be drawn as a straight line of the appropriate slope. The greatest distance scaled between the draft line and the frequency-mass curve represents the storage required to maintain the indicated draft rate. The storage required to maintain a uniform draft rate of 50 cfs for Strawberry River at Evening Shade is about 15,000 acre-feet. This storage will be deficient on the average of about once in 20 years and has a 5-percent chance of being deficient during any year.

By using this method, within-year storage requirements at 49 gaging sites, five of which are in Oklahoma and Louisiana, were computed for recurrence intervals of 2, 5, 10, and 20 years (table 2). Draft rates in excess of the minimum annual average discharge must be supplied by over-year storage. For example, the 365-day frequency curve in figure 1 shows that for a 5-year recurrence interval, a draft rate of 102 cfs can be maintained by within-year storage; for a 20-year recurrence interval, a draft rate of 56 cfs can be maintained.

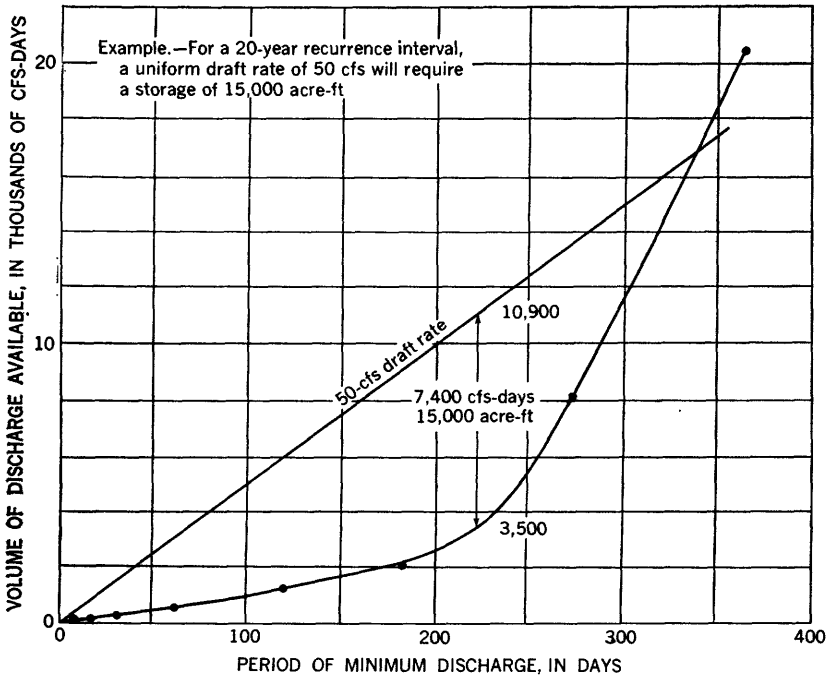

FIGURE 2.—Frequency-mass curve for Strawberry River near Evening Shade for 20-year recurrence interval. Storage not adjusted for reservoir seepage and evaporation.

OVER-YEAR STORAGE

An analysis of gaging-station records indicates that within-year storage will be inadequate at intervals of 5 years or so for higher draft rates. For a 20-year recurrence interval, over-year storage is required for streams in Arkansas when the draft rate exceeds from 30 to 50 percent of the mean annual discharge. The method of analyzing over-year storage as described by Hardison (1966) is used in this report. This method is based on probability routing of mean annual discharges to define storage requirements related to the mean flow and the variability of the annual discharges. Analysis of streamflow records at many sites in humid areas (including the 49 sites for which storage requirements were computed for this report) indicates that generally the distribution of mean annual flows may be described by one of three standard two-parameter distributions: normal, log normal, or Weibull distributions. Hardison developed diagrams for various recurrence intervals for each of the three distributions. These diagrams show the relation between storage, draft rate, and coefficient of variation of annual flows. Seasonal adjustment, as described by Hardison, should be made to draft-storage relations computed from the diagrams.

Curves showing the relation of draft rates as much as 60 percent of the mean annual discharge to storage requirements were obtained by combining over-year storage curves and within-year storage curves, computed from frequency-mass curves (fig. 2). A draft-storage curve for Strawberry River near Evening Shade for a 20-year recurrence interval, as shown in figure 3, illustrates the method of combining the two. Figure 4 shows draft-storage relations for 2-, 5-, 10-, and 20-year frequencies for Strawberry River near Evening Shade.

REGIONALIZATION OF DRAFT-STORAGE RELATIONS

Regionalizing data is a means by which draft-storage relations can be estimated for stream sites other than those where continuous-record gaging stations are located. Analyses of draft-storage data computed for stream-gaging stations indicate that these data can be regionalized by using an index of base flow as a parameter. The median annual minimum 7-day average flow (the minimum 7-day average flow having a recurrence interval of 2 years) has been used as a low-flow index in this report. The low-flow index for Strawberry River near Evening Shade is shown in figure 1.

Mean annual discharge was also found to be a factor affecting draft-

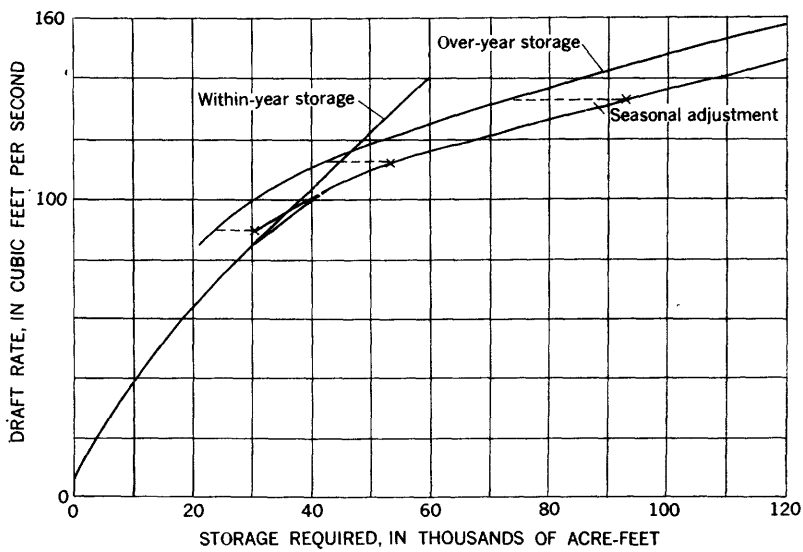

FIGURE 3.—Draft-storage diagram for 20-year recurrence interval for Strawberry River near Evening Shade, showing method of combining within-year and over-year storage curves.

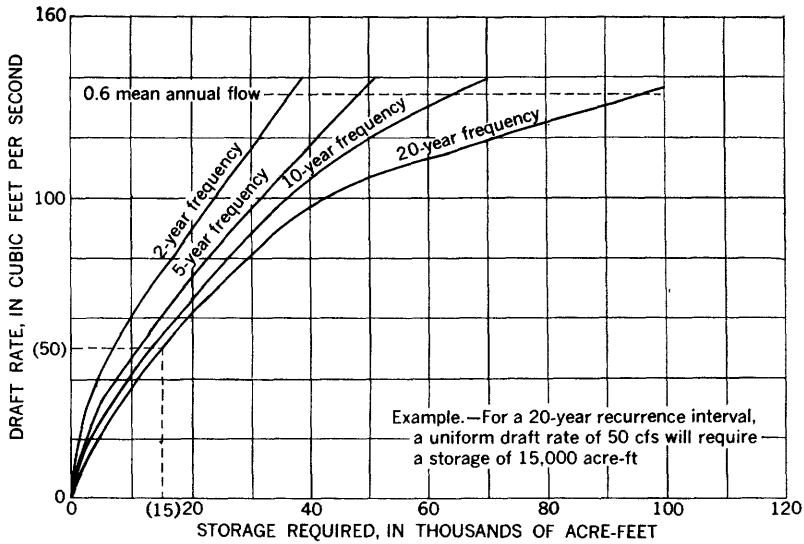

FIGURE 4.—Draft-storage diagram for selected frequencies for Strawberry River near Evening Shade. Storage not adjusted for reservoir seepage and evaporation.

storage relations when draft rates are a large percentage of the mean annual discharge. The mean-discharge parameter was utilized by expressing draft rates, storage requirements, and low-flow indices as ratios to the mean annual flow. Draft-storage curves were defined for selected recurrence intervals by three parameter plots of draft rate against the low-flow index for selected values of storage, all expressed as ratios to the mean annual flow.

These plots define draft-storage relations for draft rates as much as 60 percent of the mean annual discharge for recurrence intervals of 2, 5, 10, and 20 years. It was found that the standard error of estimate could be reduced considerably by dividing the State into three regions (pl. 1). Draft-storage diagrams for the three regions are shown in figures 5–10. Definition of the curves is illustrated by plotting gaging-station data for a storage of 0.20 of the mean annual runoff for a 20-year frequency in region B (fig. 8). The method of using the diagrams is explained in the section "Application to Water-Supply Problems."

The standard error of estimate, computed from plots of draft rates from station data and plotted against draft rates from regional curves for various storage values and frequencies in each of the three regions, is less than 10 percent. The relation between storage requirements computed from individual gaging-station data and those computed from draft-storage diagrams for a draft rate of 0.5 cfs per sq mi for a 20-year frequency are shown graphically in figure 11.

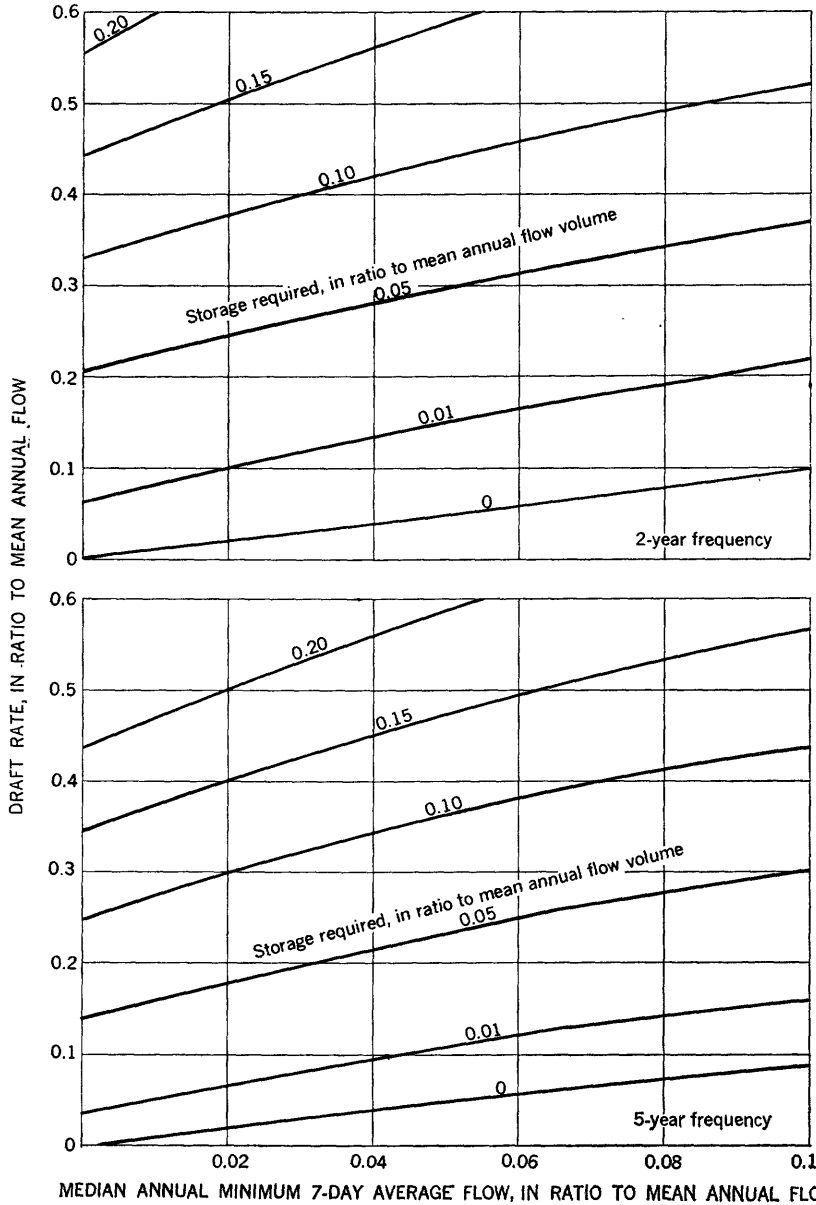

FIGURE 5.—Draft-storage relations for 2-year and 5-year frequencies related to the median annual minimum 7-day average flow for streams in region A. Relations shown are for uniform draft rates. No adjustment has been made for reservoir seepage and evaporation.

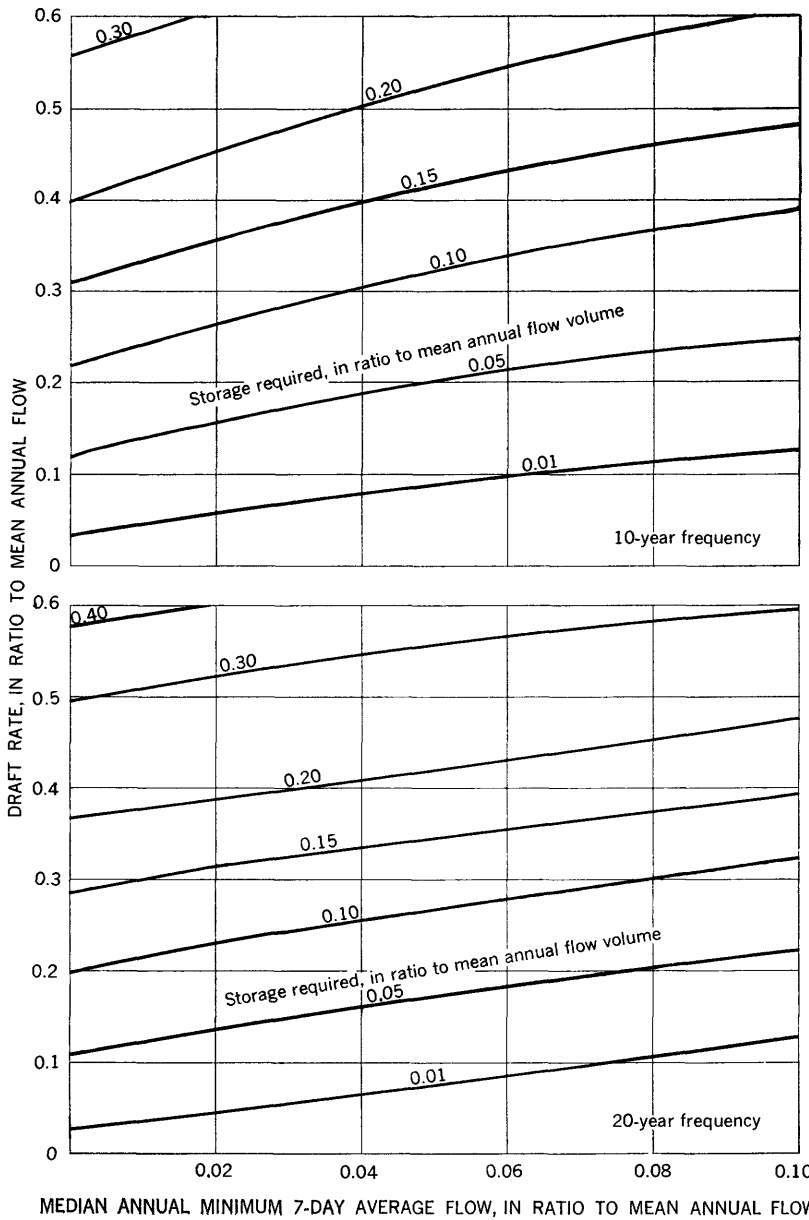

FIGURE 6.—Draft-storage relations for 10-year and 20-year frequencies related to the median annual minimum 7-day average flow for streams in region A. Relations shown are for uniform draft rates. No adjustment has been made for reservoir seepage and evaporation.

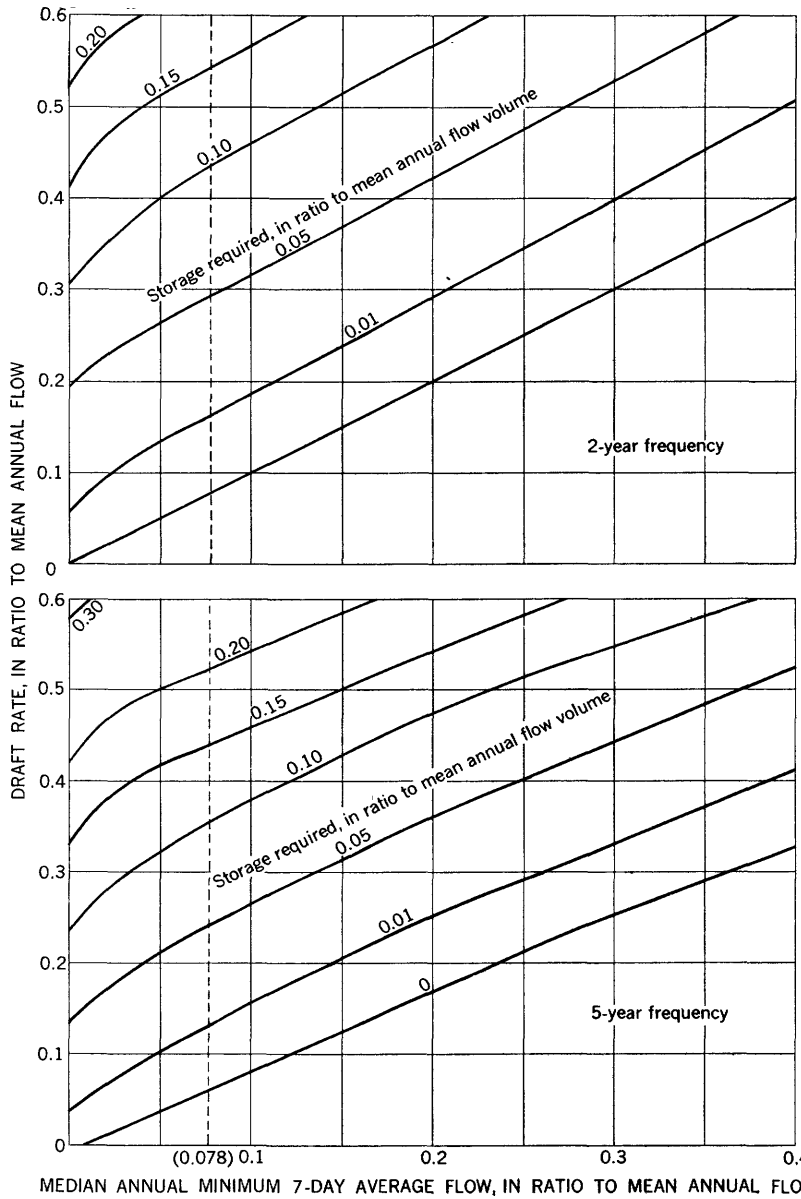

FIGURE 7.—Draft-storage relations for 2-year and 5-year frequencies related to the median annual minimum 7-day average flow for streams in region B. Relations shown are for uniform draft rates. No adjustment has been made for reservoir seepage and evaporation.

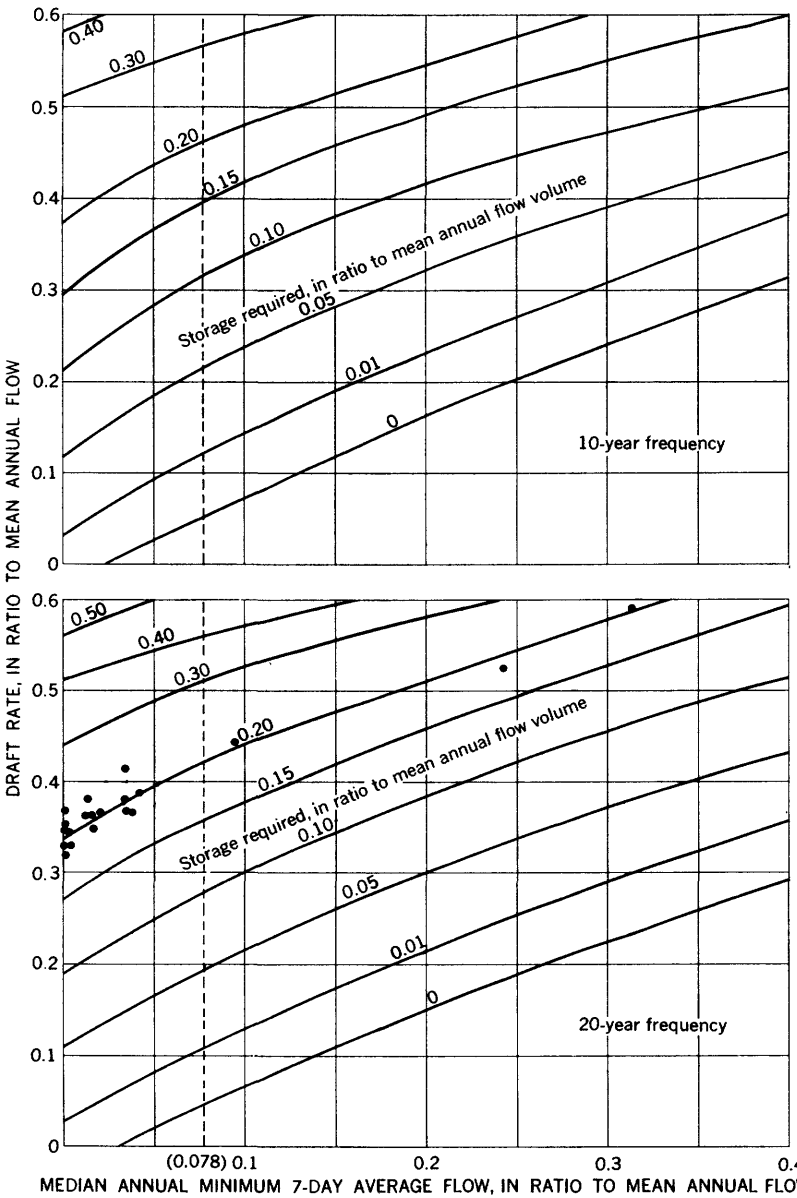

FIGURE 8.—Draft-storage relations for 10-year and 20-year frequencies related to the median annual minimum 7-day average flow for streams in region B. Relations shown are for uniform draft rates. No adjustment has been made for reservoir seepage and evaporation.

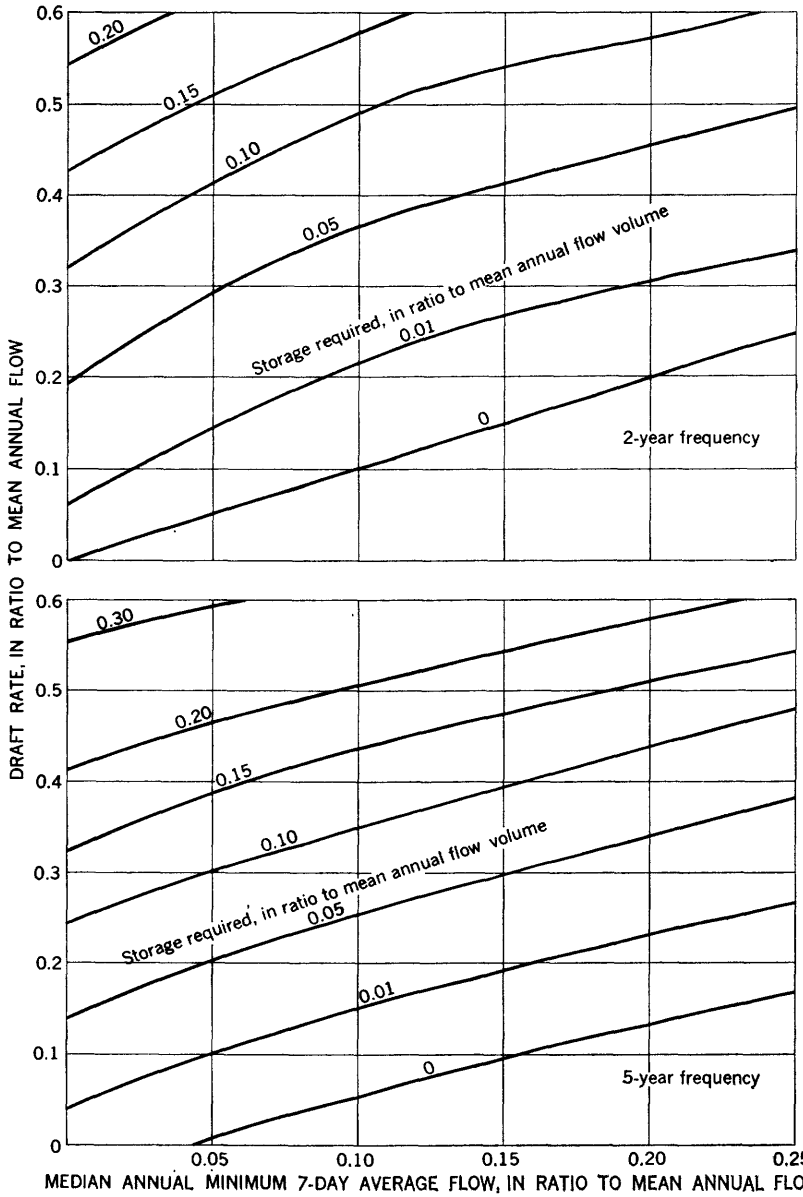

FIGURE 9.—Draft-storage relations for 2-year and 5-year frequencies related to the median annual minimum 7-day average flow for streams in region C. Relations shown are for uniform draft rates. No adjustment has been made for reservoir seepage and evaporation.

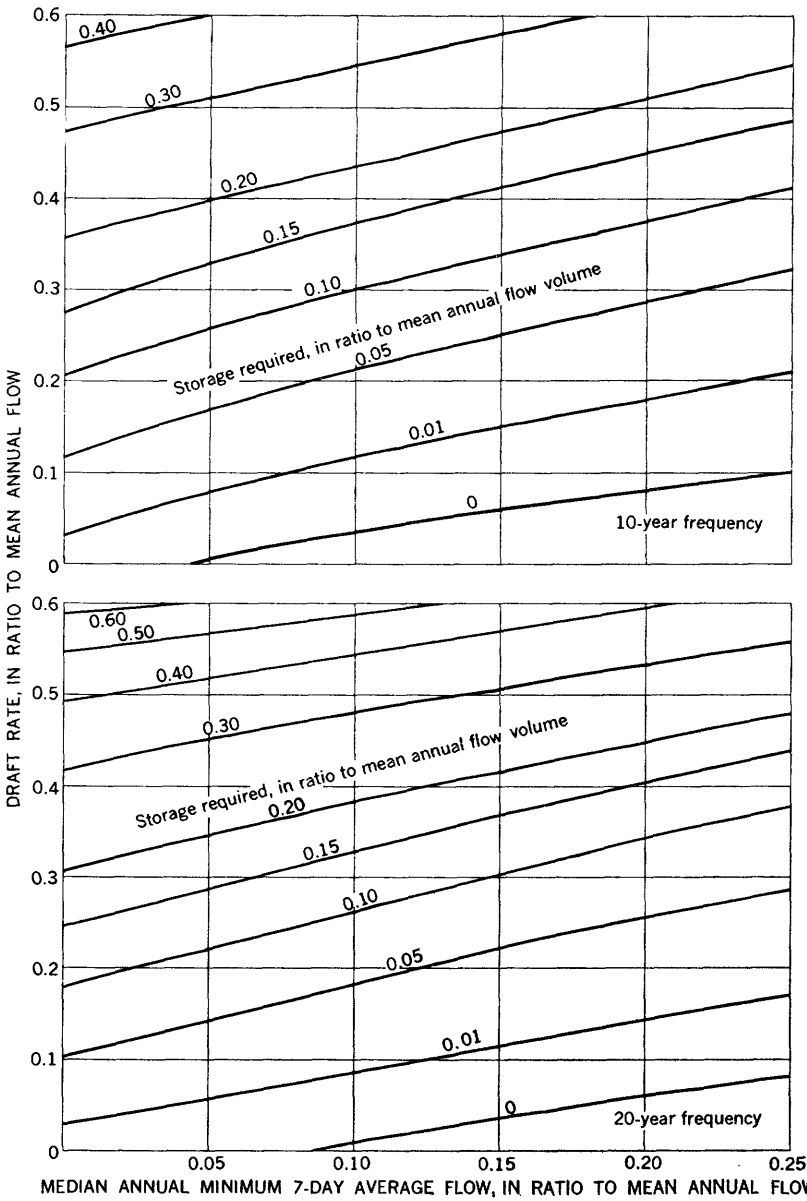

FIGURE 10.—Draft-storage relations for 10-year and 20-year frequencies related to the median annual minimum 7-day average flow for streams in region C. Relations shown are for uniform draft rates. No adjustment has been made for reservoir seepage and evaporation.

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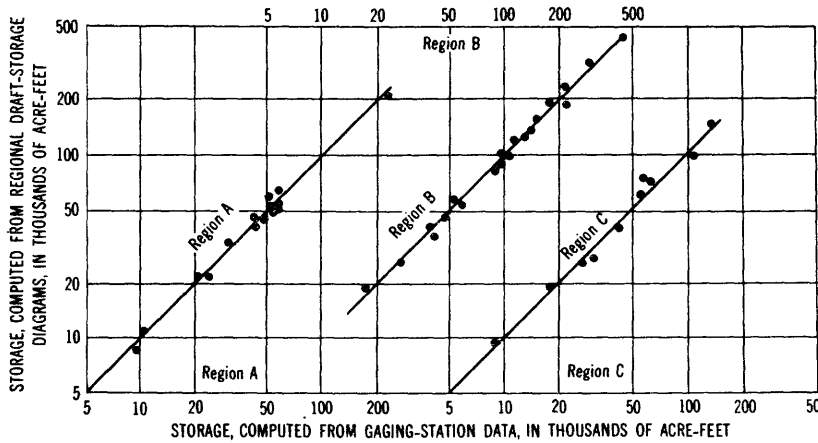

FIGURE 11.—Relation between storage requirements computed from gaging-station data and from draft-storage diagrams for a draft rate of 0.5 cubic foot per second per square mile for a 20-year frequency.

ADJUSTMENT FOR NATURAL STORAGE DEPLETION

No allowances were made for losses due to seepage, evaporation, or silt accumulation in computation of draft-storage relations. Seepage losses must be evaluated at the individual reservoir site on the basis of the permeability and porosity of the underlying geologic formations. Average annual evaporation from lakes in Arkansas varies from about 40 inches in the northeastern corner of the State to about 48 inches in the southwestern corner. (See fig. 12.) The average annual precipitation in the State is slightly greater than the evaporation and ranges from less than 44 inches in the northwestern part of the State to about 56 inches in the Ouachita Mountains. (See fig. 13.) Lake evaporation is thus not a problem in reservoir design in Arkansas during periods of normal rainfall and evaporation. During severe drought years, which are the critical periods for reservoir operation, evaporation may, however, exceed rainfall by as much as 30 or 40 inches in some areas. Losses in storage capacity due to silt accumulation in a reservoir must be evaluated on the basis of the size of the reservoir and the amount of silt being carried into the reservoir.

APPLICATION TO WATER-SUPPLY PROBLEMS

If a reservoir is built on a stream at or near one of the continuous-record gaging stations for which data are shown in table 2, the station data are directly applicable to the reservoir design without use of the draft-storage diagrams. Adjustments can be made on a drainage-area basis, if the drainage area is not greatly different from that at

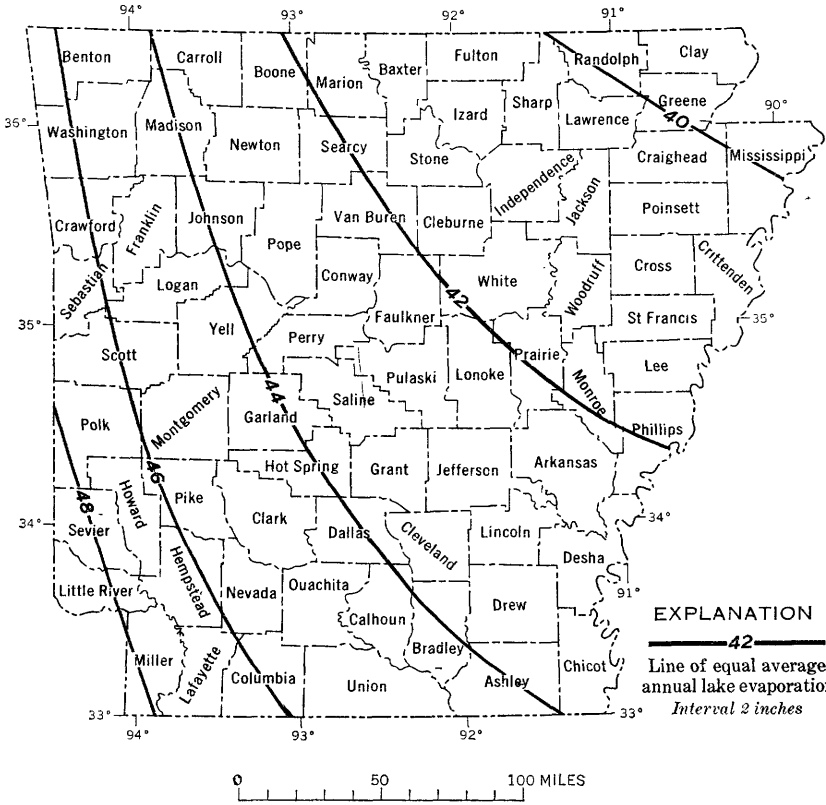

FIGURE 12.—Average annual lake evaporation for the period 1946–55 (after U.S. Weather Bureau, 1959).

the gaging station. At other potential reservoir sites, the diagrams in figures 5–10 must be used, and the designer must know (1) the draft-storage region in which the site is located, (2) the size of the drainage area above the site, (3) the mean annual discharge, (4) the value of the low-flow index at the site, and (5) the chance he is willing to take of storage being deficient.

Plate 1 shows the delineation of the State into draft-storage regions A, B, and C. The locations of the 53 continuous-record gaging stations used in the analyses and the 132 partial-record gaging stations are also shown. Plate 1 shows the average annual discharge for the State. Table 1 lists drainage areas, low-flow indices, mean annual discharge, and draft-storage regions for the 185 sites shown on plate 1. Table 2 gives draft-storage relations for 49 of the 53 continuous-record gaging stations.

If the reservoir site is not at or near a gaging station, the low-flow indices can be estimated on the basis of a few measurements of base

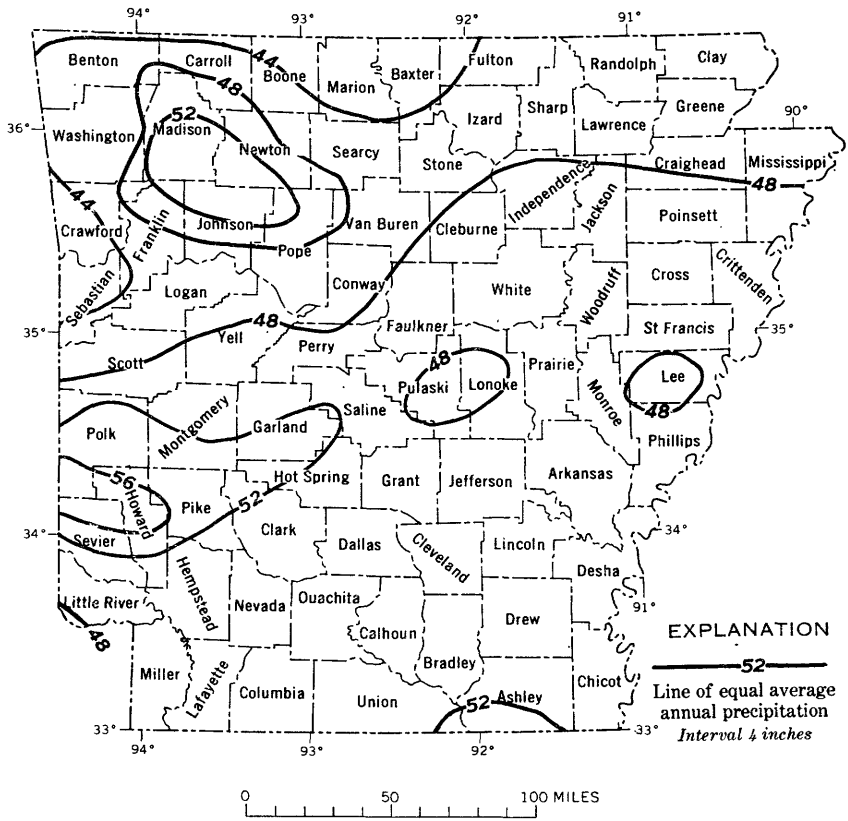

FIGURE 13.—Average annual precipitation for the period 1931–52 (after Hickman, 1959).

flow at the reservoir site. The measured base flow is correlated with concurrent daily discharge at a gaging station for which the low-flow index has been determined. The storage requirements for the site can then be computed by using the procedure outlined:

For example, assume that a draft-storage study is needed for a reservoir site on Curia Creek at the bridge on State Highway 25, 1½ miles north of Dowdy. (See drainage outline on pl. 1.) Although this is a partial-record site (station 744, table 1), let us assume that we have no record.

1. The site is in region B (pl. 1).
2. Using the best available topographic map, the drainage area above the site is determined to be 55.7 sq mi.
3. The mean annual discharge is determined to be 1.15 cfs per sq mi (pl. 1), or 64 cfs (1.15×55.7), which is equivalent to 46,300 acre-feet per year (724×64). The mean annual discharge can

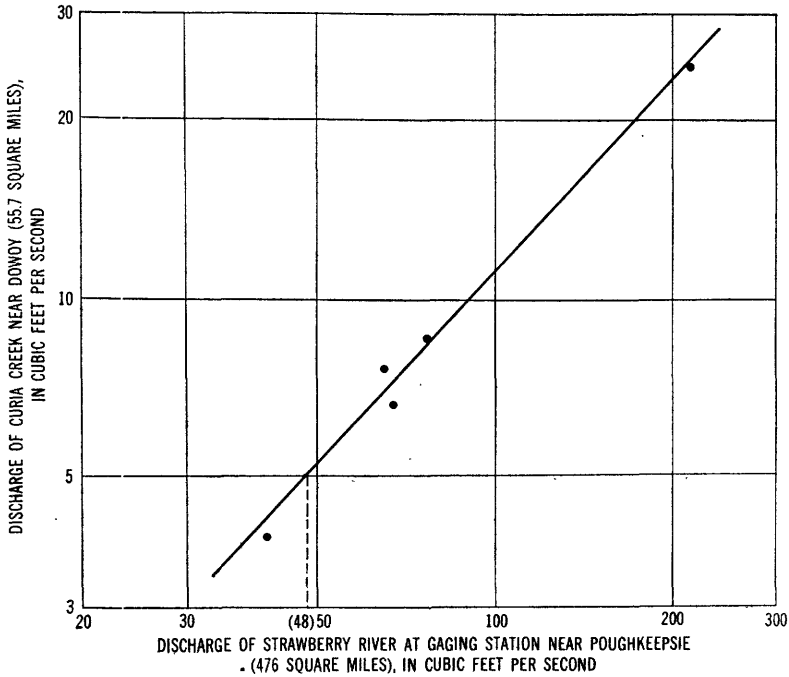

FIGURE 14.—Relation of concurrent base flows for Strawberry River near Poughkeepsie and Curia Creek near Dowdy showing method of estimating median annual minimum 7-day average flow for ungaged streams.

be determined for any site by outlining the drainage area on plate 1 and then either by estimating the discharge visually or by computing a weighted average of discharge based on areas between isograms.

4. The low-flow index (abscissa in figs. 5–10) is determined by several discharge measurements made during different periods of base flow. Plotting discharges for these measurements against concurrent daily mean discharges at nearby continuous-record gaging stations shows a good correlation (fig. 14) with Strawberry River near Poughkeepsie (station 740).
5. The low-flow index for station 740 is 48 cfs (table 1). This value is used to enter the regression in figure 14, and from it the low-flow index for Curia Creek is determined to be 5 cfs, which is $\frac{5}{64}$, or 0.078, of the mean annual discharge.
6. By entering a low-flow index of 0.078 of mean annual flow on the abscissa scale of the draft-storage diagrams for region B (figs. 7, 8), draft rates for various storage values can be read from the ordinate scale for frequencies of 2, 5, 10, and 20 years. A summary of these data for a 20-year frequency follows:

Storage value		Draft rate	
(1) Ratio to mean annual runoff	(2) Acre-feet (1)×46,300	(3) Ratio to mean annual flow	(4) Cubic feet per second (3)×64
0	0	0.045	2.9
.01	463	.106	6.8
.05	2,320	.195	12
.10	4,630	.280	18
.15	6,940	.355	23
.20	9,260	.423	27
.30	13,900	.512	33
.40	18,500	.560	36

These data can be plotted, and curves can be drawn that are similar to those shown in figure 4. By knowing the draft rate required, the storage capabilities of the site, and the frequency of deficiency of storage that can be tolerated, a detailed analysis can be made. For instance, if computations are based on data for a 20-year frequency, storage will be inadequate to maintain the design draft rate on the average of once in 20 years. Estimates should also be made of seepage and evaporation losses and silt accumulation that would reduce storage capacity, so that adjustments could be made to provide the required storage capacity.

Procedures outlined above are not applicable to streams whose flow is materially affected by regulation or diversion.

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TABLES 1–2

TABLE 1.—*Flow characteristics of selected Arkansas streams*

[Type of station: D, daily-discharge gaging station; P, partial-record or short-term daily-discharge station. Mean annual discharges: values in parentheses were estimated from plate 1. Low-flow index: median annual minimum 7-day average flow (minimum 7-day average flow having a recurrence interval of 2 years)]

Station				Drainage area (sq mi)	Mean annual discharge, adjusted to period 1929–57		Low-flow index		Region (See pl. 1 for location.)
No.	Name	Location	Type		Cubic feet per second	Cubic feet per second per square mile	Cubic feet per second	Ratio to mean	
	St. Francis River basin								
403	Big Slough Ditch near Marmaduke	Lat 36°06′55″, long 90°20′45″, in SW¼ sec. 9, T. 17 N., R. 7 E., 5½ miles southeast of Marmaduke.	P	[1] 247	(320)	(1.30)	68	0.21	B
404	Locust Creek Ditch near Paragould	Lat 36°03′10″, long 90°23′10″, in NE¼NE¼ sec. 1, T. 16 N., R. 6 E., at bridge on State Highway 25, 6 miles east of Paragould.	P	[1] 78.3	(100)	(1.30)	1.4	.014	B
466	Right Hand Chute of Little River at Rivervale.	Lat 35°40′20″, long 90°20′12″, in SW¼ sec. 10, T. 12 N., R. 7 E., at bridge on State Highway 135 at Rivervale.	D	[1] 2,106	2,837	1.35	[1] 390	.14	B
478.5	Little Bay Ditch near Jonesboro	Lat 35°49′20″, long 90°35′15″, in SW¼ sec. 20, T. 14 N., R. 5 E., at bridge on State Highway 18, 6½ miles east of Jonesboro.	P	[1] 27.1	(35)	(1.30)	0	0	B
479.2	Fifteen Mile Bayou near West Memphis.	Lat 35°08′50″, long 90°14′05″, in SW¼ sec. 10, T. 6 N., R. 8 E., at bridge on U.S. Highway 70, 3½ miles west of West Memphis.	P	[1] 66.1	(89)	(1.35)	0	0	B
479.4	L'Anguille River near Wynne	Lat 35°12′00″, long 90°53′20″, in sec. 28, T. 7 N., R. 2 E., at highway bridge 2.6 miles below Brushy Creek and 6 miles southwest of Wynne.	P	[1] 442	(600)	(1.35)	0	0	B
479.5	L'Anguille River at Palestine	Lat 34°58′20″, long 90°53′10″, in NW¼ sec. 10, T. 4 N., R. 2 E., at bridge on U.S. Highway 70, 1 mile east of Palestine.	D	[1] 786	1,159	1.47	0	0	B
	White River basin								
479.76	White River at Combs	Lat 35°49′40″, long 93°50′00″, in NW¼ sec. 2, T. 13 N., R. 27 W., at low-water crossing on county road at Combs.	P	90.9	(140)	(1.50)	.5	.0036	B
479.8	White River near Elkins	Lat 36°00′10″, long 94°00′15″, in SE¼ sec. 1, T. 15 N., R. 29 W., at highway bridge at Elkins.	P	181	(270)	(1.50)	2.1	.0078	B
479.85	Middle Fork White River near Fayetteville.	Lat 36°01′20″, long 93°04′40″, in SE¼ sec. 33, T. 16 N., R. 29 W., at ford on farm road, 1.4 miles upstream from Lake Sequoyah and 5.9 miles southeast of Fayetteville.	P	[2] 72	(100)	(1.40)	.2	.0020	B
480	West Fork White River at Greenland.	Lat 35°59′, long 94°10′, in NW¼ sec. 16, T. 15 N., R. 30 W., at bridge on U.S. Highway 71, 1 mile south of Greenland, 5½ miles upstream from small tributary, and 10.5 miles upstream from mouth.	D	83	120	1.45	.3	.0025	B
487	White River near Goshen	Lat 36°06′15″, long 94°00′50″, in NW¼ sec. 31, T. 17 N., R. 28 W., at bridge on State Highway 45, 0.2 mile upstream from Richland Creek and 1.2 miles west of Goshen.	P	408	(570)	(1.40)	1.9	.0033	B

488	Richland Creek at Goshen	Lat 36°06′05″, long 94°00′25″, in NE¼ sec. 31, T. 17 N., R. 28 W., at bridge on State Highway 45, 0.5 mile upstream from mouth and 1 mile west of Goshen.	P	147	(210)	(1.40)	.6	.0029	B
489.6	War Eagle Creek near Huntsville	Lat 36°02′30″, long 93°42′20″, in SE¼NW¼ sec. 23, T. 16 N., R. 26 W., at bridge on State Highway 23, 4.0 miles south of Huntsville.	P	110	(160)	(1.45)	.1	.0006	B
490	War Eagle Creek near Hindsville	Lat 36°12′02″, long 93°51′16″, in SE¼NE¼ sec. 28, T. 18 N., R. 27 W., at bridge on State Highway 45, 3.8 miles downstream from Clear Creek and 3.9 miles north of Hindsville.	D	262	337	1.29	5.6	.017	B
495	White River near Rogers	Lat 36°19′59″, long 94°01′07″, in NW¼ sec. 12, T. 19 N., R. 29 W., at bridge on State Highway 12, 2.6 miles upstream from Prairie Creek, 5½ miles east of Rogers, and at mile 643.2.	D	1,020	1,280	1.25	42	.033	B
496	Prairie Creek near Rogers	Lat 36°21′05″, long 94°02′30″, in NE¼ sec. 2, T. 19 N., R. 29 W., at bridge on State Highway 12, 4½ miles northeast of Rogers.	P	19.5	(19)	(.95)	1.4	.074	B
500	White River at Beaver	Lat 36°28′20″, long 93°45′55″, in NE¼ sec. 20, T. 21 N., R. 26 W., at Missouri and North Arkansas Railway bridge, a quarter of a mile east of Beaver, 2¾ miles upstream from Leatherwood Creek, and at mile 595.5.	D	1,238	1,551	1.25	53	.034	B
502.25	Kings River near Kingston	Lat 36°05′20″, long 93°32′30″, in SE¼ sec. 33, T. 17 N., R. 24 W., at bridge on State Highway 21, 3.5 miles northwest of Kingston.	P	[2]100	(130)	(1.30)	1.4	.011	B
502.3	Warm Fork Creek at Rockhouse	Lat 36°16′50″, long 93°40′05″, in SW¼ sec. 29, T. 19 N., R. 25 W., at low-water crossing on county road, 0.1 mile upstream from Kings River and 0.4 mile southeast of Rockhouse.	P	[2]19	(18)	(.95)	0	0	B
502.5	Kings River near Pleasant Valley	Lat 36°23′20″, long 93°39′30″, in NE¼ sec. 20, T. 20 N., R. 25 W., at bridge on country road, 2.9 miles upstream from Osage Creek and 3.1 miles west of Pleasant Valley.	P	351	(390)	(1.10)	7.3	.019	B
503	Osage Creek near Berryville	Lat 36°20′10″, long 93°33′50″, in NW¼ sec. 5, T. 19 N., R. 24 W., at bridge on State Highway 21, 1½ miles south of Berryville.	P	139	(140)	(1.00)	1.4	.010	B
505	Kings River near Berryville	Lat 36°25′30″, long 93°37′20″, in E½ sec. 3, T. 20 N., R. 25 W., at highway bridge, 1¼ miles downstream from Bee Creek, 2¼ miles upstream from Clabber Creek, and 5¼ miles northwest of Berryville.	D	532	571	1.07	11	.019	B
532	Long Creek at Alpena	Lat 36°17′30″, long 93°16′50″, in NE¼ sec. 23, T. 19 N., R. 22 W., at bridge on U.S. Highway 62, 1 mile east of Alpena.	P	67.3	(64)	(.95)	1.1	.017	B
532.5	Yocum Creek near Oak Grove	Lat 36°27′20″, long 93°21′30″, in NE¼ sec. 30, T. 21 N., R. 22 W., at low-water crossing on county road, 0.4 mile upstream from Spring Creek and 4.5 miles east of Oak Grove.	P	[2]50	(48)	(.95)	3.0	.062	B
544.1	Bear Creek near Omaha	Lat 36°26′50″, long 93°04′30″, in NW¼ sec. 26, T. 21 N., R. 20 W., at bridge on State Highway 14, 7.5 miles east of Omaha.	P	[2]130	(120)	(.95)	1.7	.014	B
544.2	West Sugarloaf Creek near Lead Hill.	Lat 36°25′10″, long 92°56′10″, in NW¼ sec. 6, T. 20 N., R. 18 W., at bridge on State Highway 14, 1 mile west of Lead Hill.	P	[2]32	(30)	(.95)	0	0	B
556	Crooked Creek at Pyatt	Lat 36°14′40″, long 92°50′10″, in SE¼ sec. 36, T. 19 N., R. 18 W., at bridge on U.S. Highway 62 at Pyatt.	P	207	(200)	(.95)	9.5	.048	B
556.8	Buffalo River at Pruitt	Lat 36°03′30″, long 93°08′30″, in NW¼SE¼ sec. 7, T. 16 N., R. 20 W., at bridge on State Highway 7 at Pruitt.	P	190	(250)	(1.30)	3.3	.013	B
557	Little Buffalo River at Jasper	Lat 36°00′30″, long 93°11′15″, in SE¼ sec. 27, T. 16 N., R. 21 W., at bridge on State Highway 7 at Jasper.	P	124	(170)	(1.40)	1.6	.0094	B

See footnotes at end of table.

TABLE 1.—*Flow characteristics of selected Arkansas streams*—Continued

No.	Station: Name	Station: Location	Type	Drainage area (sq mi)	Mean annual discharge, adjusted to period 1929–57: Cubic feet per second	Mean annual discharge, adjusted to period 1929–57: Cubic feet per second per square mile	Low-flow index: Cubic feet per second	Low-flow index: Ratio to mean	Region (See pl. 1 for location.)
	White River basin—Continued								
560	Buffalo River near St. Joe	Lat 35°59′, long 92°45′, in SW¼ sec. 36, T. 16 N., R. 17 W., at bridge on U.S. Highway 65, 1¼ miles downstream from Mill Creek, 4 miles upstream from Bear Creek, and 4½ miles southeast of St. Joe.	D	825	1,098	1.33	36	0.033	B
565.1	Bear Creek near Marshall	Lat 35°56′20″, long 92°42′50″, in SW¼ sec. 17, T. 15 N., R. 16 W., at bridge on U.S. Highway 65, 6.5 miles northeast of Marshall.	P	78.3	(100)	(1.30)	3.4	.034	B
570	Buffalo River near Rush	Lat 36°07′, long 92°33″, in NE¼ sec. 15, T. 17 N., R. 15 W., on left bank 0.8 mile upstream from Rush Creek, 1.5 miles southeast of Rush, and 24.3 miles upstream from mouth.	D	1,091	1,367	1.25	46	.034	B
571	Big Creek near Big Flat	Lat 35°58′40″, long 92°28′50″, in NW¼ sec. 4, T. 15 N., R. 14 W., at bridge on State Highway 14, 4.7 miles southwest of Big Flat.	P	90.3	(110)	(1.20)	1.0	.0091	B
605.2	Piney Creek near Calico Rock	Lat 36°08′40″, long 92°04′10″, in NE¼ sec. 8 ,T. 17 N., R. 10 W., at bridge on State Highway 56, 4 miles northeast of Calico Rock.	P	78.5	(78)	(1.00)	7.1	.091	B
606.7	Lick Fork tributary near Mountain View.	Lat 35°51′40″, long 92°08′50″, in W½ sec. 10, T. 14 N., R. 11 W., at bridge on State Highway 66, 1.7 miles west of Mountain View.	P	[2]2.9	(3.5)	(1.20)	0	0	B
607	South Sylamore Creek at Allison	Lat 35°56′00″, long 92°07′20″, near center of sec. 14, T. 15 N., R. 11 W., at bridge on State Highway 14 at Allison and 0.9 mile upstream from mouth.	P	126	(140)	(1.10)	7.2	.051	B
607.2	North Sylamore Creek near Allison	Lat 35°58′00″, long 92°10′20″, in NE¼ sec. 5, T. 15 N., R. 11 W., at low-water crossing on county road, 1.5 miles north of State Highway 14 and 6.5 miles northwest of Allison.	P	[2]69	(69)	(1.00)	1.8	.026	B
609	Polk Bayou at Batesville	Lat 35°46′15″, long 91°39′10″, in NE¼ sec. 17, T. 13 N., R. 6 W., at bridge on State Highway 69 at Batesville, 1.5 miles above mouth.	P	165	(180)	(1.10)	33	.18	B
688.8	Mud Creek near Ingram	Lat 36°25′20″, long 90°58′30″, in SW¼ sec. 33, T. 21 N., R.1 E., at low-water crossing on county road, 0.6 mile upstream from Fourche Creek and 3.5 miles northeast of Ingram.	P	[2]35	(40)	(1.15)	.6	.015	B
688.9	Fourche Creek above Pocahontas	Lat 36°20′21″, long 90°56′30″, in NE¼NW¼ sec. 35, T. 20 N., R. 1 E., at bridge on State Highway 115, 1.2 miles southwest of Stokes, 6.1 miles north of Pocahontas, and 8.7 miles upstream from mouth.	P	228	(260)	(1.15)	19	.73	B
689	Fourche Creek near Pocahontas	Lat 36°16′50″, long 90°55′40″, in NW¼ sec. 24, T. 19 N., R. 1 E., at bridge on State Highway 115, 2.7 miles northeast of Pocahontas and 3.8 miles upstream from mouth.	P	305	(350)	(1.15)	10	.029	B

692.65	Myatt Creek near Salem	Lat 36°26'40", long 91°40'10", in SW¼ sec. 30, T. 21 N., R. 6 W., at bridge on State Highway 9, 10 miles northeast of Salem.	P	102	(120)	(1.15)	1.3	.011	B
692.7	South Fork Spring River near Salem.	Lat 36°24'40", long 91°49'10", near center and on line between secs. 10 and 11, T. 20 N., R. 8 W., at low-water crossing on county road, 2.7 miles north of Salem.	P	[2] 170	(190)	(1.10)	6.0	.032	B
693	South Fork Spring River near Hardy.	Lat 36°18'45", long 91°30'25", on line between secs. 9 and 10, T. 19 N., R. 5 W., three-quarters of a mile upstream from mouth and 2 miles west of Hardy.	P	326	(360)	(1.10)	52	.14	B
693.5	Martins Creek near Williford	Lat 36°16'20", long 91°20'00", in NE¼ sec. 30. T. 19 N.. R. 3 W.. at bridge on U.S. Highway 63, 1.2 miles upstream from Spring River and 3 miles northeast of Williford.	P	66.6	(80)	(1.20)	3 4	042	B
694	Janes Creek at Ravenden Springs	Lat 36°18'10", long 91°14'05", in SW¼ sec. 7, T. 19 N., R. 2 W., at bridge on State Highway 90, 1 mile south of Ravenden Springs.	P	78.5	(90)	(1.15)	.1	.0011	B
695	Spring River at Imboden	Lat 36°12', long 91°10', in NE¼ sec. 15, T. 18 N., R. 2 W., at bridge on U.S. Highway 62 at Imboden, 3.9 miles downstream from Janes Creek, 8.5 miles upstream from Eleven Point River, and 12.1 miles upstream from mouth.	D	1,162	1,315	1.13	320	.24	B
720	Eleven Point River near Ravenden Springs.	Lat 36°21', long 91°07', in SE¼SE¼ sec. 30, T. 20 N., R. 1 W., at bridge on State Highway 90, 4½ miles downstream from small tributary, 6¼ miles northeast of Ravenden Springs, and 21 miles upstream from mouth.	D	1,123	1,120	.997	352	.31	B
729	Strawberry River near Franklin	Lat 36°10'50", long 91°44'40", in NW¼ sec. 33, T. 18 N., R. 7 W., at bridge on State Highway 56, 2.3 miles east of Franklin.	P	153	(153)	(1.00)	2.9	.019	B
730	Strawberry River near Evening Shade.	Lat 36°06', long 91°36', in NE¼ sec. 27, T. 17 N., R. 6 W., at bridge on U.S. Highway 167, 2 miles north of Evening Shade and 6.3 miles upstream from Piney Fork.	D	225	217	.964	8.5	.039	B
735	Piney Fork at Evening Shade	Lat 36°05', long 91°37', in NE¼ sec. 34, T. 17 N., R. 6 W., on right bank 20 ft downstream from bridge on U.S. Highway 167, three-quarters of a mile north of Evening Shade and 5.8 miles upstream from mouth.	D	99	98.2	.992	1.2	.012	B
736	Mill Creek at Evening Shade	Lat 36°03'55", long 91°36'30", in NE¼ sec. 3, T. 16 N., R. 6 W., at highway bridge a quarter of a mile upstream from mouth and half a mile southeast of Evening Shade.	P	12.5	----------	----------	14	--------	B
740	Strawberry River near Poughkeepsie.	Lat 36°07', long 91°27', in NW¼ sec. 19, T. 17 N., R. 4 W., at bridge on State Highway 58, half a mile downstream from Hurricane Creek and 2½ miles northeast of Poughkeepsie.	D	476	514	1.08	48	.093	B
740.2	North Big Creek near Evening Shade.	Lat 36°08'20", long 91°30'10", in NW¼ sec.10, T.17 N., R.5 W., at bridge on county road, 0.8 mile southeast of Center and 8 miles northeast of Evening Shade.	P	75.1	(79)	(1.05)	8.7	.11	B
742.48	South Big Creek near Strawberry	Lat 36°01'20", long 91°20'10", in N½ and on line between secs.19 and 20, T.16 N., R.3 W., at bridge on State Highway 117, 4 miles north of Strawberry.	P	69.4	(80)	(1.15)	17	.21	B
742.5	Reeds Creek near Strawberry	Lat 35°59'00", long 91°20'10", in SW¼SW¼ sec.32, T.16 N., R.3 W., at bridge on State Highway 117, 1.4 miles northwest of Strawberry.	P	34.9	(40)	(1.15)	13	.32	B
742.6	Cooper Creek near Smithville	Lat 36°03'10", long 91°18'40", in SW¼ sec. 4, T.16 N., R.3 W., at bridge on State Highway 115, 2 miles south of Smithville.	P	[2] 30	(34)	(1.15)	1.1	.032	B
744	Curia Creek near Dowdy	Lat 35°52'10", long 91°18'40", in NE¼ sec.9, T.14 N., R.3 W., at bridge on State Highway 25, 1¼ miles north of Dowdy.	P	55.7	(64)	(1.15)	5.0	.078	B

See footnotes at end of table.

TABLE 1.—*Flow characteristics of selected Arkansas streams*—Continued

Station				Drainage area (sq mi)	Mean annual discharge, adjusted to period 1929–57		Low-flow index		Region (See pl. 1 for location.)
No.	Name	Location	Type		Cubic feet per second	Cubic feet per second per square mile	Cubic feet per second	Ratio to mean	
	White River basin—Continued								
744.5	Dota Creek near Newark	Lat 35°43′40″, long 91°24′50″, in W½ and on line between secs.27 and 34, T.13 N., R.4 W., at bridge on State Highway 122, 2 miles northeast of Newark.	P	56.3	(65)	(1.15)	3.2	0.049	B
746	Village Creek at Walnut Ridge	Lat 36°04′30″, long 90°57′45″, in NE¼ sec.34, T.17 N., R.1 E., at bridge on State Highway 25 at Walnut Ridge.	P	34.3	(41)	(1.20)	0	0	B
747	Village Creek near Newport	Lat 35°35′35″, long 91°14′25″, in E½ sec.5, T.11 N., R.2 W., at bridge on State Highway 14, 3.5 miles east of Newport.	P	270	(320)	(1.20)	3.1	.0097	B
748	Departee Creek near Coffeeville	Lat 35°30′30″, long 91°23′25″, in NE¼ sec.11, T.10 N., R.4 W., at bridge on U.S. Highway 67, 1.2 miles northeast of Coffeeville.	P	[1] 101	(120)	(1.20)	0	0	B
750	Middle Fork Little Red River at Shirley.	Lat 35°39′, long 92°18′, in SW¼ sec.20, T.12 N., R.12 W., on right bank half a mile downstream from Sugar Camp (or Wevers) Creek and 1 mile east of Shirley.	D	294	504	1.71	.3	.0006	A
752	Devils Fork Little Red River near Brownsville.	Lat 35°38′20″, long 92°01′30″, in NW¼ sec.35, T.12 N., R.10 W., at highway bridge 3 miles neartheast of Brownsville.	P	193	(310)	(1.60)	.1	.0003	A
753	South Fork Little Red River at Clinton.	Lat 35°35′29″, long 92°27′20″, in SW¼ sec.14, T.11 N., R.14 W., at bridge on U.S. Highway 65 at Clinton, a quarter of a mile upstream from Archey Fork.	P	145	(270)	(1.85)	.1	.0004	A
753.9	Archey Fork Little Red River at Clinton.	Lat 35°36′10″, long 92°27′20″, in SE¼ sec.10, T.11 N., R.14 W., at bridge on U.S. Highway 65 at northeast city limits of Clinton.	P	122	(230)	(1.90)	.1	.0004	A
755	South Fork Little Red River near Clinton.	Lat 35°34′, long 92°23′, in NE¼ sec.29, T.11 N., R.13 W., on left bank 1¼ miles downstream from Peedee Creek, 4¼ miles southeast of Clinton, and 6 miles downstream from Archey Fork.	D	316	598	1.89	.2	.0003	A
760	Little Red River near Heber Springs.	Lat 35°31′02″, long 90°59′55″, in NE¼ sec.7, T.10 N., R.9 W., on right bank 1,600 ft downstream from Greers Ferry Dam and 3 miles northeast of town of Heber Springs. Prior to Oct. 1, 1960, at site 1¾ miles upstream.	D	1,141	1,878	1.65	1.2	.0006	A
765.1	Big Creek near Pangburn	Lat 35°27′10″, long 91°50′50″, in NW¼ sec. 34, T.10 N., R.8 W., at bridge on county road, 1 mile upstream from Little Red River and 2 miles north of Pangburn.	P	[2] 83	(120)	(1.40)	.1	.0008	A
765.3	Big Creek near Letona	Lat 35°21′40″, long 91°48′00″, in SE¼ sec. 36, T. 9 N., R. 8 W., at bridge on State Highway 16, 1.8 miles east of Letona.	P	72.9	(98)	(1.35)	.1	.0010	B
768	Bayou Des Arc near Garner	Lat 35°10′10″, long 91°44′45″, in SE¼ sec. 3, T. 6 N., R. 7 W., at bridge on U.S. Highway 67, 2.7 miles northeast of Garner.	P	97.1	(120)	(1.25)	0	0	B

768.5	Cypress Bayou near Beebe	Lat 35°01′30″, long 91°52′23″, in NE¼ sec. 32, T. 5 N., R. 8 W., at bridge on State Highway 31, 3 miles south of Beebe.	P	166	(210)	(1.25)	0	0	B
768.8	Bull Creek near McRae	Lat 35°05′30″, long 91°51′20″, in NW¼ sec. 3, T. 5 N., R. 8 W., at bridge on U.S. Highway 67, 2.5 miles southwest of McRae, and 1.3 miles northeast of Beebe.	P Q	89.2	(110)	(1.25)	0	0	B
769.4	Wattensaw Bayou near Lonoke	Lat 34°53′10″, long 91°52′30″, near center and on line between secs. 16 and 17, T. 3 N., R. 8 W., at bridge on State Highway 31, 7.3 miles north of Lonoke.	P	31.7	(40)	(1.25)	0	0	B
769.5	Wattensaw Bayou near Hazen	Lat 34°52′35″, long 91°33′55″, near south edge of and on line between secs. 17 and 18, T. 3 N., R. 5 W., at bridge on State Highway 11, 1 mile downstream from Barnes Creek, and 6.8 miles north of Hazen.	P	195	(240)	(1.25)	.1	.0004	B
771	Big Creek near Boydsville	Lat 36°22′10″, long 90°19′50″, in SE¼NW¼ sec. 16 T. 20 N., R. 7 E., at bridge on county road, 0.5 mile south of Crockett and 4 miles northeast of Boydsville.	P	12.9	(15)	(1.20)	0	0	B
773	Cache River near Stonewall	Lat 36°14′10″, long 09°33′45″, in NW¼ sec. 5, T. 18 N., R. 5 W., 1.2 miles southwest of Stonewall.	P	285	(340)	(1.20)	1.2	.0035	B
773.8	Cache River at Egypt	Lat 35°51′28″, long 90°56′00″, in NW¼SE¼ sec. 12, T. 14 N., R. 1 E., at bridge on State Highway 91, 1 mile southeast of Egypt, 2.2 miles northwest of Winesburg, and at mile 143.	P	698	(840)	(1.20)	21	.025	B
775	Cache River at Patterson	Lat 35°15′20″, long 91°14′40″, in S½ sec. 6, T. 7 N., R. 2 W., at bridge on U.S. Highway 64 at Patterson and 9.5 miles upstream from Maple Slough.	D	1,041	1,194	1.15	[1] 50	.042	B
776.5	Big Creek near Jonesboro	Lat 35°51′05″, long 90°45′05″, in SE¼ sec. 10, T. 14 N., R. 3 E., at bridge on U.S. Highway 63, 2.7 miles northwest of Jonesboro.	P	51.1	(61)	(1.20)	.4	.0066	B
777	Bayou DeView at Morton	Lat 35°15′07″, long 91°06′37″, near corner of secs. 4, 5, 8, and 9, T. 7 N., R. 1 W., at bridge on U.S. Highway 64, 1 mile west of Morton.	D	422	534	1.27	.3	.0006	B
779.3	Big Creek near Moro	Lat 34°50′50″, long 91°00′35″, in SW¼NW¼ sec. 28, T. 3 N., R. 1 E., at bridge on State Highway 78, 3½ miles north of Moro.	P	80.9	(100)	(1.25)	.2	.0020	B
779.4	Spring Creek near Aubrey	Lat 34°41′20″, long 90°53′40″, in SW¼SE¼ sec. 16, T. 1 N., R. 2 E., at bridge on State Highway 121, 2.1 miles south of Aubrey.	P	36	(45)	(1.25)	0	0	B
779.5	Big Creek at Poplar Grove	Lat 34°33′20″, long 90°50′45″, in N½ sec. 1, T. 2 S., R. 2 E., at bridge on State Highway 20, three-quarters of a mile northeast of Poplar Grove.	P	389	(490)	(1.25)	0	0	B
779.7	Big Cypress Creek at Turner	Lat 34°27′45″, long 91°01′15″, in E½ sec. 5, T. 3 S., R. 1 E., at bridge on State Highway 1, 1 mile south of Turner.	P	125	(160)	(1.25)	.2	.0012	B
780	Lagrue Bayou near Stuttgart	Lat 34°31′55″, long 91°21′20″, in NW¼ sec. 17, T. 2 S., R. 3 W., at bridge on State Highway 146, 7½ miles downstream from small tributary, 11 miles east of Stuttgart, and 24 miles upstream from Little Lagrue Bayou.	D	175	206	1.18	.1	.0005	B
	Arkansas River basin								
1948	Illinois River at Savoy	Lat 36°06′05″, long 94°20′30″, in SE¼ sec. 36, T. 17 N., R. 32 W., at bridge on State Highway 16, 0.5 mile west of Savoy.	P	167	(200)	(1.20)	3.1	.016	C
1949.5	Little Osage Creek near Healing Springs.	Lat 36°14′40″, long 94°16′20″, in NW¼ sec. 15, T. 18 N., R. 31 W., 0.5 mile upstream from mouth and 1.5 miles south of Healing Springs.	P	40.0	(38)	(.95)	12.1	.31	C

See footnotes at end of table.

TABLE 1.—*Flow characteristics of selected Arkansas streams*—Continued

Station				Drainage area (sq mi)	Mean annual discharge, adjusted to period 1929–57		Low-flow index		Region (See pl. 1 for location.)
No.	Name	Location	Type		Cubic feet per second	Cubic feet per second per square mile	Cubic feet per second	Ratio to mean	
	Arkansas River basin—Continued								
1950	Osage Creek near Elm Springs	Lat 36°13′, long 94°17′, in sec. 21, T. 18 N., R. 31 W., on left bank 1 mile downstream from Little Osage Creek and 3¼ miles northwest of Elm Springs.	D	129	123	0.953	22	0.18	C
1955	Illinois River near Watts, Okla.	Lat 36°07′48″, long 94°34′12″, in NE¼ sec. 18, T. 19 N., R. 26 E., at bridge on U.S. Highway 59, 1.5 miles north of Watts, 4.5 miles downstream from Cincinnati Creek, and at mile 106.2.	D	635	649	1.02	77	.12	C
1958	Flint Creek at Springtown	Lat 36°15′20″, long 94°25′50″, in NW¼ sec. 7, T. 18 N., R. 32 W., on right bank 20 ft downstream from State Highway 12, 0.8 mile southwest of Springtown.	P	[2] 14	(13)	(.95)	.9	.069	C
1960	Flint Creek near Kansas, Okla.	Lat 36°11′54″, long 94°42′30″, in SW¼ sec. 24, T. 20 N., R. 24 E., at bridge on Oklahoma State Highway 33, 6 miles southeast of Kansas, 6 miles downstream from Sager Creek, and at mile 2.8.	D	110	103	.936	14	.14	C
1969	Barren Fork at Dutch Mills	Lat 35°52′40″, long 94°29′10″, on line between secs. 21 and 22, T. 14 N., R. 33 W., at bridge on State Highway 59 at Dutch Mills, 2¾ miles upstream from Arkansas-Oklahoma State line.	P	[2] 43	(52)	(1.20)	0	0	C
1969.5	Evansville Creek at Evansville	Lat 35°48′40″, long 94°29′45″, near south edge of and on line between secs. 15 and 16, T. 13 N., R. 33 W., at bridge on State Highway 59, 1 mile north of Evansville.	P	23.5	(28)	(1.20)	0	0	C
2470	Poteau River at Cauthron	Lat 34°55′08″, long 94°17′55″, in SW¼ sec. 16, T. 3 N., R. 31 W., at highway bridge at Cauthron, 8 miles downstream from Jones Creek.	D	200	226	1.13	0	0	C
2471	Black Fork near Page, Okla.	Lat 34°45′35″, long 94°29′45″, in sec. 5, T. 3 N., R. 27 E., Indian Meridian, at highway bridge 2 miles west of Arkansas-Oklahoma State line, and 5 miles northeast of Page.	P	46.6	(61)	(1.30)	0	0	C
2472	Big Creek at Howard	Lat 34°42′20″, long 94°26′40″, in sec. 31, T. 1 N., R. 32 W., 300 ft north of U.S. Highway 270, 1 mile east of Arkansas-Oklahoma State line at Howard.	P	10.9	(15)	(1.40)	0	0	C
2473	Haws Creek near Black Fork	Lat 34°47′35″, long 94°25′05″, in sec. 32, T. 2 N., R. 32 W., at highway bridge 2 miles east of Arkansas-Oklahoma State line and 2 miles north of Black Fork.	P	8.0	(9.6)	(1.20)	0	0	C
2494	James Fork near Hackett	Lat 35°09′45″, long 94°24′25″, in NW¼NW¼ sec. 34, T. 6 N., R. 32 W., at bridge on State Highway 45, 1.7 miles south of Hackett, 2 miles downstream from Elder Branch, 2 miles upstream from small tributary, and 3.8 miles upstream from Arkansas-Oklahoma State line.	D	148	163	1.10	.4	.0025	C

2495	Cove Creek near Lee Creek	Lat 35°43'20", long 94°24'30", in SW¼NW¼ sec. 16, T. 12 N., R. 32 W., at highway bridge, 4½ miles northwest of Lee Creek and 5¾ miles upstream from mouth.	D	36.9	47	1.27	0	0	C
2496	Lee Creek at Natural Dam	Lat 35°38'40", long 94°23'30", in SW¼ sec. 10, T. 11 N., R. 32 W., at bridge on State Highway 59 at Natural Dam.	P	168	(220)	(1.30)	.4	.0018	C
2497	Mountain Fork Creek at Natural Dam.	Lat 35°39'10", long 94° 23'55", in SE¼ sec. 9, T. 11 N., R. 32 W., 200 ft upstream from mouth and a quarter of a mile west of Natural Dam.	P	36.0	(43)	(1.20)	0	0	C
2498	Lee Creek near Short, Okla	Lat 35°34'05", long 94°31'55", on line between secs. 27 and 32, T. 13 N., R. 26 E., Indian Meridian, at highway bridge 2 miles west of Short.	P	236	(300)	(1.25)	.6	.0020	C
2499	Little Lee Creek near Short, Okla.	Lat 35°34'30", long 94°33'00", in NW¼ sec. 28, T. 13 N., R. 26 E., Indian Meridian, at highway bridge 2¼ miles upstream from mouth and 3 miles west of Short.	P	103	(120)	(1.20)	0	0	C
2500	Lee Creek near Van Buren	Lat 35°29'40", long 92°27'00", in SE¼ sec. 21, T. 12 N., R. 27 E., Indian Meridian, on right bank 300 ft west of Arkansas-Oklahoma State line, 3.2 miles downstream from Webbers Creek, 6¾ miles northwest of Van Buren, and 7.9 miles upstream from mouth.	D	427	557	1.30	1.1	.0020	C
2506	Vache Grasse Creek near Lavaca	Lat 35°19'05", long 94°13'00", in NW¼ sec. 5, T. 7 N., R. 30 W., at bridge on State Highway 22, 2.5 miles south of Lavaca.	P	111	(110)	(1.00)	0	0	C
2507	Big Creek at Bloomer	Lat 35°17'30", long 94°08'00", in SW¼NW¼ sec. 7, T. 7 N., R. 29 W., at bridge on State Highway 22 at Bloomer.	P	53.8	(56)	(1.05)	0	0	C
2514	Cedar Creek near Rudy	Lat 35°31'30", long 94°17'10", in SE¼ sec. 22, T. 10 N., R. 31 W., 200 ft upstream from mouth and 0.5 mile southwest of Rudy.	P	51.2	(61)	(1.20)	0	0	C
2520	Mulberry River near Mulberry	Lat 35°34', long 94°01', in NW¼ sec. 6, T. 10 N., R. 28 W., on left bank a quarter of a mile upstream from Mill Creek, 5 miles northeast of Mulberry, and 11.3 miles upstream from mouth.	D	372	574	1.54	1.5	.0026	A
2521	Little Mulberry Creek near Mulberry.	Lat 35°30'25", long 94°04'30", in SE¼ sec. 27, T. 10 N., R. 29 W., at bridge on U.S. Highway 64, 1.2 miles northwest of Mulberry.	P	52.1	(65)	(1.25)	0	0	A
2523	White Oak Creek near Ozark	Lat 35°30'20", long 93°56'50", in SW¼ sec. 26, T. 10 N.. R. 28 W., at bridge on U.S. Highway 64, 7.5 miles west of Ozark.	P	76.9	(100)	(1.30)	0	0	A
2562	Horsehead Creek at Hartman	Lat 35°26'00", long 93°36'25", in SE¼ sec. 13, T. 9 N., R. 25 W., at bridge on U.S. Highway 64, 0.5 mile east of Hartman.	P	123	(160)	(1.30)	.1	.0006	A
2565	Spadra Creek at Clarksville	Lat 35°28'06", long 93°27'46", in NE¼ sec. 5, T. 9 N., R. 23, W., 1,000 ft downstream from bridge on U.S. Highway 64 and 4½ miles upstream from mouth.	D	54.8	87	1.59	.3	.0034	A
2567	Shoal Creek near New Blaine	Lat 35°17'35", long 93°27'40", in SE¼ sec. 5, T. 7 N., R. 23 W., at bridge on State Highway 22, 2 miles west of New Blaine.	P	55.2	(69)	(1.25)	0	0	C
2570	Piney Creek near Dover	Lat 35°33'00", long 93°09'25", in NE¼NE¼ sec. 6, T. 10 N., R. 20 W., on left bank 7¼ miles downstream from Indian Creek and 10 miles north of Dover.	D	274	441	1.61	.7	.0016	A
2572	Little Piney Creek near Lamar	Lat 35°26'55", long 93°20'20", near center of sec. 9, T. 9 N., R. 22 W., at highway bridge 2.5 miles east of Lamar.	P	156	(230)	(1.50)	0	0	A
2575	Illinois Bayou near Scottsville	Lat 35°27'58", long 93°02'28", in SW¼ sec. 32, T. 10 N., R. 19 W., at bridge on country road, 1¼ miles north of Scottsville and 3 miles downstream from North Fork Illinois Bayou.	D	242	396	1.64	.4	.0010	A
2585	Petit Jean River near Booneville	Lat 35°06'25", long 93°55'25", in NW¼NW¼ sec. 18, T. 5 N., R. 27 W., at bridge on State Highway 23, 0.5 mile downstream from Fletcher Creek and 2¼ miles south of Booneville.	D	247	264	1.07	.1	.0004	C

See footnotes at end of table.

TABLE 1.—*Flow characteristics of selected Arkansas streams*—Continued

Station No.	Station Name	Station Location	Type	Drainage area (sq mi)	Mean annual discharge, adjusted to period 1929–57: Cubic feet per second	Mean annual discharge, adjusted to period 1929–57: Cubic feet per second per square mile	Low-flow index: Cubic feet per second	Low-flow index: Ratio to mean	Region (See pl. 1 for location.)
	Arkansas River basin—Continued								
2587	Sugar Creek near Sugar Grove	Lat 35°04′40″, long 93°49′00″, in NE¼ sec. 25, T. 5 N., R. 27 W., at highway bridge 1.1 miles west of Sugar Grove.	P	97.7	(120)	(1.20)	0.1	0.0008	C
2600	Dutch Creek at Waltreak	Lat 34°59′15″, long 93°36′45″, in SE¼NW¼ sec. 24, T. 4 N., R. 25 W., on left bank a quarter of a mile north of Waltreak and 20 miles upstream from mouth.	D	74	93	1.26	0	0	C
2606	Spring Creek near Danville	Lat 35°05′10″, long 93°23′30″, in SE¼ sec. 13, T. 5 N., R. 23 W., at bridge on State Highway 27, 1¾ miles north of Danville.	P	28.8	(36)	(1.25)	0	0	C
2607	Point Remove Creek near Morrilton.	Lat 35°10′55″, long 92°47′05″, in NW¼ sec. 11, T. 6 N., R. 17 W., at bridge on U.S. Highway 64, 3 miles northwest of Morrilton.	P	484	(680)	(1.40)	0	0	A
2610	Cadron Creek near Guy	Lat 35°17′56″, long 92°24′10″, in SE¼ sec. 29, T. 8 N., R. 13 W., at bridge on U.S. Highway 65, 4 miles southwest of Guy and 10.8 miles upstream from Cove Creek.	D	187	311	1.66	.1	.0003	B
2612	East Fork Cadron Creek near Enola.	Lat 35°13′10″, long 92°16′40″, in NE¼ sec. 28, T. 7 N., R. 12 W., at highway bridge 4.5 miles west of Enola.	P	145	(200)	(1.35)	0	0	B
2614	Mill Creek near Boles	Lat 34°44′20″, long 94°04′50″, in SE¼SE¼ sec. 16, T. 1 N., R. 29 W., at bridge on U.S. Highway 71, 4 miles south of Boles.	P	55.0	(82)	(1.50)	0	0	B
2615	Fourche La Fave River near Gravelly.	Lat 34°52′, long 93°39′, in NW¼ sec. 34, T. 3 N., R. 25 W., at bridge on State Highway 28, 1 mile downstream from Garner Creek, 1¾ miles east of Gravelly, and 6.4 miles upstream from Gaffords Creek.	D	413	570	1.38	.2	.0004	B
2616	Gaffords Creek near Bluffton	Lat 34°53′50″, long 93°36′50″, in sec. 24, T. 3 N., R. 25 W., at bridge on State Highway 28, 0.8 mile southwest of Bluffton and 1 mile upstream from mouth.	P	42.8	(60)	(1.40)	0	0	B
2630	South Fourche La Fave River near Hollis.	Lat 34°55′, long 93°03′, in NE¼ sec. 18, T. 3 N., R. 19 W., on left bank 0.6 mile upstream from Big Cove Creek, 4 miles northeast of Hollis, and 5.8 miles upstream from mouth.	D	211	303	1.44	0	0	A
2636	Fourche Creek at Little Rock	Lat 34°32′55″, long 92°15′30″, in NE¼ sec. 14, T. 1 N., R. 12 W., at bridge on U.S. Highway 65 at Little Rock.	P	162	(200)	(1.25)	.2	.0010	B
2638.9	Little Bayou Meto at Reydel	Lat 34°09′20″, long 91°34′00″, in E½ sec. 20, T. 6 S., R. 5 W., at bridge on State Highway 88 at Reydel.	P	450	(540)	(1.20)	0	0	B
2640	Bayou Meto near Lonoke	Lat 34°44′10″, long 91°54′58″, in SW¼ sec. 6, T. 1 N., R. 8 W., at bridge on State Highway 31, 3 miles upstream from Brushy Slough and 3½ miles south of Lonoke.	P	203	274	1.34	.2	.0007	B
2642	Two Prairie Bayou at Carlisle	Lat 34°46′45″, long 91°46′05″, in SW¼ sec. 21, T. 2 N., R. 7 W., at bridge on U.S. Highway 70, 1 mile west of Carlisle.	P	149	(190)	(1.25)	.1	.0005	B

2645	Bayou Meto near Stuttgart	Lat 34°27′15″, long 91°37′00″, in SE¼ sec. 11, T. 3 S., R. 6 W., at bridge on U.S. Highway 79, 5½ miles southwest of Stuttgart and 8 miles upstream from Crooked Creek.	D	560	----------	----------	0	0	B
	Red River basin								
3369	Walnut Bayou near Foreman	Lat 33°39′20″, long 94°22′35″, on east line sec. 12, T. 13 S., R. 32 W., at highway bridge 5 miles southeast of Foreman.	P	83.6	(96)	(1.15)	0	0	B
3395	Rolling Fork near DeQueen	Lat 34°03′, long 94°25′, in SW¼ sec. 21, T. 8 S., R. 32 W., at bridge on U.S. Highway 70, 4 miles west of DeQueen, 6 miles upstream from Rock Creek and 17 miles upstream from mouth.	D	181	304	1.68	.4	.0013	A
3405	Cossatot River near DeQueen	Lat 34°03′, long 94°13′, on south edge of SE¼ sec. 20, T. 8 S., R. 30 W., at bridge on U.S. Highway 71 just downstream from Hale Creek and 7 miles east of DeQueen.	D	361	604	1.67	7.0	.012	A
3410	Saline River near Dierks	Lat 34°06′, long 94°05′, in W½ sec. 3, T. 8 S., R. 29 W., at bridge on U.S. Highway 70, 3½ miles upstream from Holly Creek and 4 miles southwest of Dierks.	D	124	189	1.52	.1	.0005	A
3412	Saline River near Lockesburg	Lat 33°57′43″, long 94°03′40″, in NW¼SE¼ sec. 23, T. 9 S., R. 29 W., at bridge on State Highway 24, 2 miles downstream from Brushy Creek, 6 miles east of Lockesburg, and at mile 30.	P	260	(380)	(1.45)	.5	.0013	B
3421.5	Maniece Bayou near Canfield	Lat 33°11′45″, long 93°41′15″, in SW¼ sec. 10, T. 18 S., R. 25 W., at highway bridge 3.1 miles west of Canfield and 3.3 miles upstream from mouth.	P	109	(100)	(.95)	.2	.0020	B
3423.5	McKinney Bayou near Garland	Lat 33°24′50″, long 93°48′30″, in SE¼ sec. 29, T. 15 S., R. 26 W., at bridge on U.S. Highway 82, 1 mile downstream from Red Chute and 6.7 miles northwest of Garland.	P	169	(170)	(1.00)	0	0	B
3470	Kelly Bayou near Hosston, La	Lat 32°51′25″, long 93°52′20″, in SW¼NE¼ sec. 36, T. 22 N., R. 15 W., at bridge on U.S. Highway 71, 0.4 mile downstream from Willow Lake lateral, 2 miles south of Hosston, and 2.7 miles upstream from mouth.	D	116	88	.759	2.7	.031	B
3486	Bayou Dorcheat at Buckner	Lat 33°21′30″, long 93°24′50″, in NW¼ sec. 18, T. 16 S., R. 22 W., at bridge on U.S. Highway 82, 1 mile east of Buckner.	P	101	(120)	(1.15)	0	0	B
3490	Bayou Dorcheat near Minden, La	Lat 32°35′55″, long 93°20′00″, in NW¼ sec. 31, T. 19 N., R. 9 W., 500 ft upstream from bridge on U.S. Highway 80, three-quarters of a mile upstream from Louisiana & Arkansas Railway Co. bridge and 3 miles west of Minden.	D	1,097	1,150	1.05	1.1	.0010	B
3494.3	Bodcau Creek at Stamps	Lat 33°22′00″, long 93°31′20″, in NW¼ sec. 7, T. 16 S., R. 23 W., at bridge on U.S. Highway 82, 0.1 mile upstream from Tatum Branch and 1 mile west of Stamps.	P	234	306	1.31	0	0	B
3495	Bodcau Bayou near Sarepta, La. (Bodcau Creek in Arkansas).	Lat 32°54′15″, long 93°28′55″, in NW¼ sec. 15, T. 22 N., R. 11 W., at bridge on State Highway 2, 2 miles west of Sarepta and 9.5 miles upstream from Caney Creek.	D	546	601	1.10	.4	.0007	B
3560	Ouachita River near Mount Ida	Lat 34°26′40″, long 93°41′45″, in sec. 32, T. 1 S., R. 25 W., on right bank 350 ft upstream from bridge on U.S. Highway 270, 4½ miles upstream from Fiddlers Creek, and 5½ miles northwest of Mount Ida.	D	410	723	1.76	16	.022	A
3565	South Fork Ouachita River at Mount Ida.	Lat 34°34′, long 93°38′, in NW¼ sec. 24, T. 2 S., R. 25 W., at bridge on U.S. Highway 270 at Mount Ida, 2¾ miles upstream from Williams Creek and 22.5 miles upstream from mouth.	D	64	103	1.61	3.0	.029	A
3587	Gulpha Creek near Hot Springs	Lat 34°28′15″, long 92°59′20″, in E½ sec. 13, T. 3 S., R. 19 W., at bridge on U.S. Highway 270, 4.6 miles southeast of Hot Springs.	P	50.2	(75)	(1.50)	1.4	.019	A

TABLE 1.—*Flow characteristics of selected Arkansas streams*—Continued

Station				Drainage area (sq mi)	Mean annual discharge, adjusted to period 1929–57		Low-flow index		Region (See pl. 1 for location.)
No.	Name	Location	Type		Cubic feet per second	Cubic feet per second per square mile	Cubic feet per second	Ratio to mean	
	Red River basin—Continued								
3596	Caddo River at Caddo Gap	Lat 34°23′55″, long 93°37′10″, in NE¼ sec. 13, T. 4 S., R. 25 W., at highway bridge at Caddo Gap.	P	115	(210)	(1.80)	18	0.086	A
3598	Caddo River near Alpine	Lat 34°16′00″, long 93°21′45″, in SW¼SE¼ sec. 28, T. 5 S., R. 22 W., at Runyan Bridge on gravel road between Alpine and Bismarck, 7.1 miles below Sugar Fork Creek, and 33.8 miles above mouth.	D	312	545	1.75	24	.044	A
3601	L'Eau Frais Creek at Joan	Lat 34°06′10″, long 92°55′50″, in SW¼ sec. 22, T. 7 S., R. 18 W., at highway bridge 0.5 mile southeast of Joan.	P	79.4	(99)	(1.25)	1.6	.016	B
3602	Little Missouri River near Langley	Lat 34°18′50″, long 93°53′55″, in SW¼ sec. 16, T. 5 S., R. 27 W., at highway bridge 3.5 miles west of Langley.	P	66.5	(120)	(1.80)	12	.10	A
3608	Muddy Fork Creek near Murfreesboro.	Lat 34°05′00″, long 93°45′05″ in NE¼ sec. 3, T. 8 S., R. 26 W., 1.8 miles upstream from mouth and 3 miles northwest of Murfreesboro.	D	121	166	1.37	0	0	A
3612	Ozan Creek near McCaskill	Lat 33°52′34″, long 93°35′34″, in NE¼NW¼ sec. 17, T.10 S., R 24 W., at bridge on State Highway 24, 3.5 miles southeast of McCaskill and 14.5 miles upstream from mouth.	P	148	(180)	(1.25)	0	0	B
3615	Antoine River at Antoine	Lat 34°02′20″, long 93°25′05″, in NW¼ sec. 24, T. 8 S., R. 23 W., at bridge on State Highway 26 at Antoine, 1.6 miles downstrem from Brushy Creek, 1.9 miles downstream from Suck Creek, and 8.5 miles upstream from mouth.	D	181	267	1.48	.1	.0004	A
3616.5	Terre Rouge Creek near Prescott	Lat 33°46′45″, long 93°14′05″, in SW¼ sec. 14, T. 11 S., R. 2 W., at bridge on State Highway 24, 8.5 miles east of Prescott.	P	231	(290)	(1.25)	.2	.0007	B
3617	Caney Creek near Bluff City	Lat 33°45′40″, long 93°09′00″, in NW¼ sec. 22, T. 11 S., R. 20 W., at bridge on State Highway 24, 3.6 miles north of Bluff City.	P	167	(200)	(1.20)	0	0	B
3618	Terre Noire Creek near Gurdon	Lat 33°55′00″, long 93°02′15″, in SW¼ sec. 27, T. 9 S., R. 19 W., at highway bridge 7 miles east of Gurdon.	P	250	(320)	(1.30)	.2	.0006	B
3618.5	Tulip Creek near Pine Grove	Lat 33°51′30″, long 92°44′25″, in NW¼ sec. 16, T. 10 S., R. 16 W., at bridge on State Higheay 128, 2 miles southeast of Pine Grove.	P	152	(180)	(1.20)	1.3	.0072	B
3619	Bayou Freeo near Eagle Mills	Lat 33°43′30″, long 92°42′20″, on line between and near south edge of secs. 35 and 36, T. 11 S., R. 16 W., at bridge on State Highway 9, 2.5 miles north of Eagle Mills.	P	94.8	(110)	(1.15)	.1	.0009	B
3621	Smackover Creek near Smackover	Lat 33°22′40″, long 92°46′45″, in SE¼ sec. 32, T. 15 S., R. 16 W., at bridge on State Highway 7, 3 miles northwest of Smackover and 23 miles above mouth.	P	377	(430)	(1.15)	4.7	.011	B

3625	Moro Creek near Fordyce	Lat 33°47′, long 92°20′, in NW¼ sec. 3, T. 11 S., R. 12 W., at bridge on State Highway 8, 1,100 ft upstream from Caney Creek, 4 miles southeast of Fordyce, and 12 miles upstream from White Water Creek.	D	216	250	1.16	0	0	C
3625.5	Moro Creek near Banks	Lat 33°32′45″, long 92°18′40″, in NW¼ sec. 35, T. 13 S., R. 12 W., at bridge on State Highway 4, 3.5 miles southwest of Banks.	P	374	(430)	(1.15)	0	0	C
3626	Alum Fork at Crows	Lat 34°36′55″, long 92°45′05″, in NW¼ sec. 29, T. 1 S., R. 16 W., at bridge on State Highway 5, 1 mile east of Crows.	P	123	(180)	(1.45)	1.2	.0067	A
3627	Middle Fork at Crows	Lat 34°36′55″, long 92°46′50″, in NW¼ sec. 25, T. 1 S., R. 17 W., at bridge on State Highway 5, 0.5 mile west of Crows.	P	109	(160)	(1.45)	3.6	.022	A
3628	South Fork near Hot Springs	Lat 34°35′10″, long 92°58′20″, in SE¼ sec. 6, T. 2 S., R. 18 W., at bridge on State Highway 5, 7 miles northeast of Hot Springs.	P	12.9	(19)	(1.45)	.9	.047	A
3629	North Fork near Benton	Lat 34°36′25″, long 92°37′05″, in SW¼ sec. 28, T. 1 S., R. 15 W., at bridge on State Highway 5, 4 miles northwest of Benton.	P	132	(180)	(1.40)	.7	.0039	B
3630	Saline River at Benton	Lat 34°34′05″, long 92°36′40″, in NE¼ sec. 9, T. 2 S., R. 15 W., on left bank three-quarters of a mile west of Benton and 3 miles downstream from confluence of North Fork and Alum Fork.	D	569	815	1.43	12	.015	B
3631	Francois Creek near Poyen	Lat 34°19′10″, long 92°36′45″, near center of sec. 3, T. 5 S., R. 15 W., at bridge on U.S. Highway 270, 2 miles east of Poyen.	P	84.1	(110)	(1.30)	.1	.0009	B
3633	Hurricane Creek near Sheridan	Lat 34°19′10″, long 92°20′40″, in NW¼NE¼ sec. 6, T. 4 S., R. 12 W., at bridge on U.S. Highway 270, 2.8 miles downstream from Simpson Creek and 3.5 miles east of Sheridan.	P	204	(260)	(1.25)	1.5	.0058	B
3635	Saline River near Rye	Lat 33°42′, long 92°02′, on line between secs. 3 and 4, T. 12 S., R. 9 W., at bridge on State Highway 15, 4 miles southwest of Rye and 5 miles upstream from Hudgin Creek.	D	2,062	2,499	1.21	26	.010	B
3637	Hudgin Creek near Pansy	Lat 33°49′55″, long 91°58′45″, in NE¼ sec. 24, T. 10 S., R. 9 W., at bridge on State Highway 11, 1.5 miles northeast of Pansy.	P	90.3	(100)	(1.15)	0	0	C
3640	Saline River near Warren	Lat 33°35′, long 92°01′, sec. 15, T. 13 S., R. 9 W., at bridge on State Highway 4, 3 miles downstream from Cypress Creek and 3½ miles southeast of Warren.	P	2,476	2,990	1.21	34	.011	B
3640.2	Eagle Creek at Hermitage	Lat 33°26′15″, long 92°11′30″, in NE¼ sec. 1, T. 15 S., R. 11 W., at bridge on State Highway 15, 0.5 mile southeast of Hermitage.	P	167	(190)	(1.15)	0	0	C
3641.5	Bayou Bartholomew near McGehee.	Lat 33°37′40″, long 91°26′45″, in W½ sec. 30, T. 12 S., R. 3 W., at bridge on State Highway 4, 2.7 miles west of McGehee.	P	592	614	1.04	15	.024	B
3641.7	Cutoff Creek near Selma	Lat 33°40′20″, long 91°34′40″, in SE¼ sec. 11, T. 12 S., R. 5 W., at bridge on State Highway 4, 1.6 miles southwest of Selma.	P	88.4	(100)	(1.15)	0	0	C
3642.5	Chemin-a-Haut Creek near Berlin.	Lat 33°05′30″, long 91°45′50″, in SW¼ sec. 31, T. 18 S., R. 6 W., at highway bridge 1.5 miles north of Berlin.	P	216	(250)	(1.15)	0	0	C
3645	Bayou Bartholomew near Beekman, La.	Lat 32°52′20″, long 91°52′04″, in NW¼NW¼ sec. 28, T. 22 N., R. 6 E., at bridge on State Highway 139, 0.8 mile downstream from Bayou De Glaize, 4 miles south of Beekman, and 7 miles north of Bastrop.	D	1,645	1,694	1.03	103	.061	B
3658	Cornie Bayou near Three Creeks	Lat 33°02′, long 92°56′, in NW¼ sec. 36, T. 19 S., R. 18 W., at bridge on State Highway 15, 4½ miles downstream from Pidgeon Roost Creek and 6 miles southwest of town of Three Creeks.	D	180	188	1.04	.3	.0016	B
3659	Three Creek near Three Creeks	Lat 33°04′, long 92°53′, in SE¼ sec. 17, T. 19 S., R. 17 W., at bridge on State Highway 15, 2¼ miles southwest of town of Three Creeks.	P	46	(53)	(1.15)	.6	.011	B

[1] Revised. [2] Approximately.

TABLE 2.—*Draft-storage relations at gaging stations on selected Arkansas streams*

Station No.	Station Name	Drainage area (sq mi)	Recurrence interval (years)	Storage required, in acre-feet per square mile, to maintain uniform draft rates, in cubic feet per second per square mile, indicated in column subheads (uncorrected for seepage and evaporation; dash leaders indicate physical limitation of storage sites or draft rates in excess of 0.60 of mean annual flow.											
				0.02	0.05	0.10	0.15	0.20	0.30	0.40	0.50	0.60	0.70	0.80	1.00
	St. Francis River basin														
466	Right Hand Chute Little River at Rivervale	2,106	2	0	0	0	0	0.24	4.8	17	33	----			
			5	0	0	.11	2.1	8.2	30	64	----				
			10	0	0	1.3	6.2	19	48	----					
			20	0	0.10	4.0	13	27	61	----					
479.5	Languille River at Palestine	786	2	.60	2.3	6.2	11	17	32	50	74	100	----		
			5	1.20	3.7	9.8	18	30	60	98	----				
			10	1.4	4.7	13	25	40	80	----					
			20	1.8	6.0	17	33	51	97	----					
	White River basin														
480	West Fork White River at Greenland	83	2	.90	4.4	12	22	32	56	82	112	142	173	206	----
			5	2.5	9.0	21	35	50	85	121	162	203	247	290	----
			10	3.6	11	27	44	62	103	148	194	243	294	350	----
			20	4.4	13	32	50	72	118	168	220	285	365	460	----
490	War Eagle Creek near Hindsville	262	2	.10	1.5	7.3	16	26	47	70	97	126	158	190	----
			5	.20	3.6	13	25	38	68	100	136	175	220	275	----
			10	.90	4.7	16	30	45	80	122	170	220	300	420	----
			20	1.4	6.3	18	35	54	97	148	210	300	420	580	----
505	Kings River near Berryville	532	2	0	1.1	6.1	13	22	44	70	100	133	----		
			5	.56	3.8	13	26	41	73	111	153	200	----		
			10	1.4	5.8	17	32	50	88	133	180	240	----		
			20	1.8	7.2	20	37	58	104	160	232	345	----		
560	Buffalo River near St. Joe	825	2	0	.10	4.6	14	25	47	72	100	130	165	204	----
			5	0	1.6	9.6	22	35	63	95	134	175	220	266	----
			10	.25	3.2	13	28	44	77	117	160	208	280	390	----
			20	.47	4.0	16	32	51	90	132	185	260	370	540	----
570	Buffalo River near Rush	1,091	2	0	.10	3.4	9.4	18	38	65	95	128	165	210	----
			5	0	.80	7.0	18	31	62	96	133	173	213	260	----
			10	0	2.0	11	24	40	73	112	152	200	265	390	----
			20	.10	3.1	14	29	47	83	125	170	238	350	540	----
695	Spring River at Imboden	1,162	2	0	0	0	0	0	.50	13	34	58	84	115	----
			5	0	0	0	0	0	4.2	28	59	100	145	200	----
			10	0	0	0	0	0	7.5	37	81	140	224	340	----
			20	0	0	0	0	0	12	46	98	180	350	600	----
720	Eleven Point River near Ravenden Springs	1,123	2	0	0	0	0	0	0	3.4	20	46	----		
			5	0	0	0	0	0	1.1	20	52	93	----		
			10	0	0	0	0	0	5.6	35	75	128	----		
			20	0	0	0	0	0	9.6	43	85	155	----		

730	Strawberry River near Evening Shade	225	2	0	.32	5.0	13	25	54	90	130	164			
			5	0	1.2	11	25	41	78	120	165	215			
			10	0	1.9	14	31	50	91	138	190	285			
			20	0	2.3	17	37	58	104	160	255	430			
735	Piney Fork at Evening Shade	99	2	.16	1.7	5.7	12	19	39	64	94	130			
			5	.95	4.5	13	24	37	69	108	148	200			
			10	1.6	7.7	20	34	50	86	128	184	285			
			20	2.2	9.5	24	41	60	102	155	250	400			
740	Strawberry River near Poughkeepsie	476	2	0	0	0	2.5	8.2	23	45	72	104			
			5	0	0	.33	6.2	16	43	76	113	155			
			10	0	0	.76	10	21	54	94	140	210			
			20	0	0	1.5	13	29	65	110	172	300			
750	Middle Fork Little Red River at Shirley	294	2	1.4	4.8	12	21	31	53	78	104	135	164	200	268
			5	2.9	9.2	21	34	49	80	113	148	185	220	264	340
			10	3.8	11	26	41	58	95	134	174	216	260	300	410
			20	4.4	14	32	50	69	110	153	196	243	286	335	500
755	South Fork Little Red River near Clinton	316	2	1.5	4.9	12	21	30	52	76	103	130	160	190	266
			5	2.8	8.8	21	34	49	80	113	150	188	225	265	350
			10	4.0	12	26	42	60	95	134	173	215	256	300	400
			20	4.8	14	30	48	66	106	148	190	233	280	330	460
775	Cache River at Patterson	1,041	2	0	.1	3.0	11	21	49	83	115	150			
			5	0	.9	10	26	44	80	117	158				
			10	.1	2.1	13	31	50	88	132					
			20	.3	3.2	16	35	54	96	150					
777	Bayou DeView at Morton	422	2	.90	3.7	11	20	31	58	90	124	162			
			5	1.9	6.7	18	31	47	82	122	162				
			10	2.8	9.0	23	40	58	99	145					
			20	3.4	11	28	47	69	117	170					
780	Lagrue Bayou near Stuttgart	175	2	.6	2.5	7.6	14	23	43	69	97	130			
			5	1.1	4.7	14	26	40	72	110	155				
			10	1.7	6.6	18	33	50	88	132					
			20	2.3	9.1	24	41	61	104	154					
	Arkansas River basin														
1950	Osage Creek near Elm Springs	129	2	0	0	0	0	.83	10	27	57	103			
			5	0	0	0	.92	5.3	29	70	122	180			
			10	0	0	.24	3.0	11	42	90	150	230			
			20	0	0	.90	5.5	16	54	115	200	370			
1955	Illinois River near Watts, Okla	635	2	0	0	0	.37	3.0	17	40	65	98			
			5	0	0	.68	4.5	15	51	89	133	185			
			10	0	.16	4.2	15	31	70	118	178	248			
			20	0	1.6	9.3	22	40	88	150	222	370			
1960	Flint Creek near Kansas, Okla	110	2	0	0	0	.22	2.6	18	42	67	100			
			5	0	0	.52	4.2	17	48	85	132	188			
			10	0	.29	4.5	14	29	65	116	178	245			
			20	0.22	2.9	11	23	39	85	146	230	400			
2470	Poteau River at Cauthron	200	2	1.6	5.8	15	25	38	65	95	130	166	203		
			5	4.0	12	27	43	60	96	138	185	240	304		
			10	5.7	16	34	54	74	122	175	238	305	400		
			20	6.8	18	41	66	93	150	210	278	385	560		

TABLE 2.—*Draft-storage relations at gaging stations on selected Arkansas streams*—Continued

Station No.	Station Name	Drainage area (sq mi)	Recurrence interval (years)	Storage required, in acre-feet per square mile, to maintain uniform draft rates, in cubic feet per second per square mile, indicated in column subheads (uncorrected for seepage and evaporation; dash leaders indicate physical limitation of storage sites or draft rates in excess of 0.60 of mean annual flow.											
				0.02	0.05	0.10	0.15	0.20	0.30	0.40	0.50	0.60	0.70	0.80	1.00
	Arkansas River basin—Continued														
2494	James Fork near Hackett	148	2	0.4	2.2	7.6	15	24	46	74	108	142	185	----	----
			5	2.0	7.0	18	32	47	82	120	163	210	260	----	----
			10	3.8	11	27	45	64	104	150	200	262	355	----	----
			20	4.8	15	34	56	79	130	188	262	365	520	----	----
2495	Cove Creek near Lee Creek	36.9	2	1.0	3.9	10	17	25	45	66	91	120	157	205	----
			5	1.9	6.7	17	30	45	78	118	162	210	270	335	----
			10	3.1	10	25	44	63	108	160	215	280	350	460	----
			20	4.4	13	31	50	72	123	183	250	350	500	700	----
2500	Lee Creek near Van Buren	427	2	1.3	5.0	14	25	37	61	86	110	140	171	208	----
			5	2.8	8.9	22	36	53	88	126	162	200	252	310	----
			10	3.7	11	27	44	63	103	147	198	255	330	460	----
			20	4.4	13	32	52	74	122	172	234	325	450	650	----
2520	Mulberry River near Mulberry	372	2	.7	3.1	9.5	18	29	54	80	106	136	170	202	278
			5	2.3	7.8	20	34	50	84	118	152	188	224	260	340
			10	3.3	10	25	40	59	97	133	171	210	252	300	420
			20	4.3	13	29	46	65	103	145	185	230	275	350	630
2565	Spadra Creek at Clarksville	54.8	2	.44	2.4	8.7	19	30	53	79	106	136	167	202	270
			5	1.6	6.2	18	32	48	80	115	152	190	230	272	360
			10	2.4	9.1	25	43	60	96	134	172	214	255	300	440
			20	4.3	13	31	50	67	106	146	185	230	270	340	590
2570	Piney Creek near Dover	274	2	.96	4.2	11	19	28	49	73	99	128	156	188	255
			5	2.4	7.7	19	31	45	76	108	144	182	222	262	350
			10	3.3	10	24	39	56	91	130	170	212	258	302	400
			20	4.0	12	27	44	63	102	144	188	234	280	332	450
2575	Illinois Bayou near Scottsville	242	2	1.0	4.2	11	20	29	51	77	104	135	168	202	276
			5	3.2	9.5	22	34	48	80	115	150	187	223	262	345
			10	3.9	11	25	41	58	94	132	172	214	260	303	400
			20	4.6	12	28	45	63	102	142	184	230	280	335	480
2585	Petit Jean River near Booneville	247	2	1.0	5.0	15	27	39	68	100	132	170	210	----	----
			5	3.3	10	25	42	61	103	150	200	250	310	----	----
			10	4.4	14	33	54	77	126	180	235	320	520	----	----
			20	5.6	16	36	59	86	142	200	280	430	700	----	----
2600	Dutch Creek at Waltreak	74	2	2.1	6.8	16	28	40	67	97	130	162	200	240	----
			5	4.2	12	28	44	63	102	140	182	224	274	330	----
			10	5.4	15	34	54	74	117	162	216	280	380	580	----
			20	6.6	18	39	61	85	138	200	260	360	530	780	----

2610	North Fork Cadron Creek near Guy	187	2	1.5	5.2	13	23	34	58	85	114	146	180	215	290
			5	4.0	11	25	41	57	91	127	165	203	243	284	370
			10	5.0	14	31	50	68	104	142	184	230	280	340	500
			20	6.2	16	35	54	73	114	158	208	260	335	440	740
2615	Fourche La Fave River near Gravelly	413	2	1.7	5.6	14	24	34	58	85	114	145	177	210	----
			5	3.5	10	23	38	52	87	120	157	195	233	274	----
			10	4.5	13	29	46	64	102	140	180	222	280	365	----
			20	5.7	16	34	53	72	113	158	205	270	380	530	----
2630	South Fourche La Fave River near Hollis	211	2	1.2	4.3	12	21	31	56	85	117	150	190	230	----
			5	3.4	10	23	38	53	86	122	160	200	240	280	----
			10	4.6	13	29	45	63	100	140	180	222	268	312	----
			20	5.2	14	32	50	70	112	154	200	245	290	360	----
	Red River basin														
3395	Rolling Fork near DeQueen	181	2	.8	3.5	9.7	17	26	49	73	98	123	150	178	232
			5	2.2	7.8	19	31	46	77	112	148	183	218	255	330
			10	3.7	11	25	40	56	91	128	167	205	250	295	400
			20	4.2	12	27	44	61	99	138	183	230	280	330	540
3405	Cossatot River near DeQueen	361	2	0	1.3	5.9	13	20	39	60	82	107	133	162	220
			5	.40	3.7	13	25	38	66	97	130	163	202	240	320
			10	.90	5.8	17	32	48	84	120	158	197	236	280	365
			20	1.3	7.6	22	38	56	95	138	182	228	280	326	440
3410	Saline River near Dierks	124	2	1.0	4.3	11	20	30	52	76	100	125	150	172	220
			5	3.1	9.4	22	35	50	80	114	147	182	220	252	322
			10	4.1	12	27	43	60	96	134	173	212	252	290	370
			20	5.1	14	32	50	70	110	152	195	240	288	350	540
3470	Kelly Bayou near Hosston, La	116	2	0	1.2	8.0	18	31	63	100	----				
			5	.04	2.8	15	30	48	84	125	----				
			10	.08	3.8	18	36	54	96	----					
			20	.15	4.7	21	39	59	103	----					
3490	Bayou Dorcheat near Minden, La	1,097	2	1.9	8.4	21	35	52	87	122	----				
			5	4.2	14	30	48	65	104	----					
			10	5.6	15	33	52	72	112	----					
			20	6.5	17	36	58	81	130	----					
3495	Bodcau Bayou near Sarepta, La	546	2	2.0	8.5	21	35	50	84	120	----				
			5	4.0	13	30	46	64	100	----					
			10	5.1	15	32	50	70	110	----					
			20	5.9	16	35	55	76	124	----					
3560	Ouachita River near Mount Ida	410	2	0	.15	2.2	6.6	13	31	53	77	100	123	147	197
			5	0	1.1	7.0	16	28	50	76	104	138	170	208	280
			10	.14	2.2	10	21	33	60	89	120	154	192	233	320
			20	.37	3.7	14	26	40	72	107	143	180	220	265	380
3565	South Fork Ouachita River at Mount Ida	64	2	0	.03	1.7	6.3	13	26	43	63	87	113	142	210
			5	.30	1.7	7.5	16	26	50	79	110	142	178	215	290
			10	.90	4.0	12	23	35	64	95	130	156	202	240	320
			20	1.3	5.3	15	27	42	75	112	152	193	238	294	490
3598	Caddo River near Alpine	312	2	0	0	.40	3.1	8.4	22	42	66	94	123	155	220
			5	0	0	3.1	9.3	19	44	74	105	140	176	214	295
			10	0	.25	5.0	14	26	56	91	130	168	210	254	350
			20	0	.67	7.8	19	33	66	105	148	193	240	295	415

TABLE 2.—*Draft-storage relations at gaging stations on selected Arkansas streams*—Continued

Station No.	Station Name	Drainage area (sq mi)	Recurrence interval (years)	Storage required, in acre-feet per square mile, to maintain uniform draft rates, in cubic feet per second per square mile, indicated in column subheads (uncorrected for seepage and evaporation; dash leaders indicate physical limitation of storage sites or draft rates in excess of 0.60 of mean annual flow.											
				0.02	0.05	0.10	0.15	0.20	0.30	0.40	0.50	0.60	0.70	0.80	1.00
	Red River basin—Continued														
3608	Muddy Fork Creek near Murfreesboro	121	2	1.4	5.4	15	25	37	63	92	123	157	193	230	----
			5	3.4	11	26	43	62	98	135	173	210	247	284	----
			10	4.8	14	31	49	69	110	154	198	244	298	350	----
			20	5.5	16	34	54	74	118	163	213	266	322	390	----
3615	Antoine River at Antoine	181	2	1.5	5.5	15	27	41	72	104	140	175	212	250	----
			5	3.2	11	27	44	62	97	132	168	204	242	230	----
			10	4.4	14	31	50	68	105	142	180	217	257	295	----
			20	6.1	17	35	54	73	112	150	188	226	276	340	----
3625	Moro Creek near Fordyce	216	2	4.5	12	25	40	58	94	134	176	220	----	----	----
			5	5.8	15	32	52	74	122	172	225	----	----	----	----
			10	6.6	17	37	59	85	138	194	----	----	----	----	----
			20	7.5	19	40	65	94	153	222	----	----	----	----	----
3630	Saline River at Benton	569	2	0	.70	5.6	12	21	42	66	92	122	155	190	----
			5	.25	3.5	13	25	38	68	103	140	180	224	270	----
			10	.78	4.8	17	32	49	84	124	168	214	263	330	----
			20	1.4	6.9	21	38	56	96	140	190	240	294	380	----
3635	Saline River near Rye	2,062	2	.16	2.4	9.0	18	30	56	88	124	----	----	----	----
			5	.92	5.4	18	34	50	86	125	----	----	----	----	----
			10	1.4	7.5	23	41	61	98	140	----	----	----	----	----
			20	2.0	9.5	27	47	65	105	154	----	----	----	----	----
3645	Bayou Bartholomew near Beekman, La	1,645	2	0	0	1.5	6.7	16	41	72	----	----	----	----	----
			5	0	.13	3.0	13	33	69	----	----	----	----	----	----
			10	0	.60	7.8	22	41	77	----	----	----	----	----	----
			20	0	1.6	11	27	47	87	----	----	----	----	----	----
3658	Cornie Bayou near Three Creeks	180	2	1.0	5.4	17	32	48	83	117	153	----	----	----	----
			5	2.5	9.8	25	43	60	100	142	----	----	----	----	----
			10	3.4	12	29	47	66	110	154	----	----	----	----	----
			20	4.0	14	32	50	71	120	178	----	----	----	----	----

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CONTENTS

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